0047254

16 STA. 2

DEC 04 1995

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 602048

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
B Plant Complex Operations	B Plant Environmental Engineering	N/A
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
Transition Projects	E. R. Hafla	N/A
8. Originator Remarks:		**9. Equip./Component No.:**
For initial release.		N/A
		10. System/Bldg./Facility:
		B Plant
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:**
		N/A
		13. Permit/Permit Application No.:
		N/A
		14. Required Response Date:
		August 14, 1995

MAY 1997 RECEIVED EDMC

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-EV-108	-	0	Organic Phase and Aqueous Phase Sampling Analysis Plan	E,Q	2	1	

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(M) MSIN	(L) Date	(J) Name	(K) Signature	(M) MSIN	(L) Date	(G) Reason	(H) Disp.
1	1	Cog.Eng. E. R. Hafla	Evan Hafla	S6-70		Central Files (2)	A3-88	~~L8-04~~		3	
1	1	Cog. Mgr. ~~K. A. Jennings-Hill~~		~~S4-07~~		~~DOE (D)~~		~~L8-07~~		3	
1	2	QA: ~~W. T. Hitchcock~~		~~S4-49~~		C. H. Mulkey		R1-51		1	2
1	2	222S: G. L. Miller		T6-06	9/14/95						
1	2	Tank Farms: J. M. Jones		S5-13		S E. Killoy	S E. Killoy	S6-70	12/14/95	1	1

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
T. M. Ridge 8/10/95 Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	K. A. Jennings-Hill 8/10/95 Cognizant Manager Date	☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

BD-7400-172-2 (04/94) GEF097

BD-7400-172-1 (07/91)

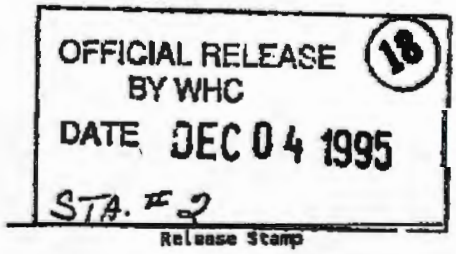
Organic Phase and Aqueous Phase Sampling Plan

T. M. Ridge
Westinghouse Hanford Co., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 602048 UC: 502
Org Code: 16550 Charge Code: KB31B
B&R Code: EW3135090 Total Pages: 38 40

Key Words: Organics; SAP; Sampling; B Plant; Solvent Extraction

Abstract: This document provides the Sample Analysis Plan (SAP) which describes the process by which samples for characterization of the aqueous and organic phase inventories at B Plant.



Release Approval 12/4/95 Date Release Stamp

Approved for Public Release

RECORD OF REVISION

(1) Document Number: WHC-SD-WM-EV-108 Rev 0

(2) Title: Organic Phase and Aqueous Phase Sampling Analysis Plan

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0 RSE	(7) Engineering Data Transmittal #602048	E. R. Hafla	K. A. Jennings-Mills 6/14/95

Organic Phase and Aqueous Phase Sampling Analysis Plan

Prepared By: T. M. Ridge, B Plant Regulatory Compliance

August 1995

Table of Contents

1.0 Plan Description 1
1.1 Introduction 1
1.2 Purpose 1
1.3 Scope 2

2.0 Organizational Responsibilities 2
2.1 B Plant Regulatory Compliance 2
2.2 B Plant Transition Engineering 2
2.3 B Plant Transition Operations 2
2.4 B Plant Health Physics Organization 2
2.5 Compliance, Sampling, and Support Operations (CSSO) 3
2.6 222S Laboratory 3
2.7 1706 KE Laboratory 3

3.0 Aqueous Sampling and Analysis 3
3.1 Sampling Equipment 3
3.2 Sampling Procedure 3
3.3 Limitations 4
3.4 Sampling Parameters 4
3.5 Data Quality Criteria 4
3.6 Quality Assurance/Quality Control 4
3.7 Transportation 5
3.8 Sample Custody 5

4.0 Organic Sampling and Analysis 5
4.1 Sampling Equipment 5
4.2 Sampling Procedure 5
4.3 Limitations 5
4.4 Analytical Parameters 6
4.5 Deviations from Protocol 6
4.5.1 Sampling Equipment 6
4.5.2 Logbook Entries 7
4.5.3 Sample Seals 7
4.5.4 Use of Shielded Containers 7
4.5.5 Preservatives and Sample Holding Time 8
4.5.6 Sample Volumes 8
4.6 Internal Quality Checks 8
4.7 Data Quality Criteria 8
4.8 Quality Assurance/Quality Control 9
4.9 Transportation 9
4.10 Sample Custody 9

5.0 Health and Safety 9

6.0 References 10

APPENDIX A Data Quality Objective Process for Selection of Analytes for the Organic and Aqueous Phase Waste A-0

APPENDIX B DSSI Waste Profile Sheet B-0

1.0 Plan Description

1.1 Introduction

Prior to restart of B Plant in 1968, high-level wastes from reactor fuels reprocessing operations at Purex were stored as an alkaline slurry in underground tanks in the A and AX Tank Farms of 200 East Area. The B-Plant fission product recovery process was used to recover Cs-137 and Sr-90 from single shell tank (SST) waste. The B-Plant process used ion exchange to separate Cs-137 and solvent extraction with a mixture of Di-2ethylhexyl phosphoric acid (HDEHPA) and Tributyl Phosphate (TBP) in Normal Paraffin Hydrocarbon (NPH) to separate Sr-90 from the waste. After the B-Plant process was shut down in 1979, the solvent has been stored in contact with an aqueous phase in six tanks at the plant.

The six tanks holding organic and aqueous phase liquids were consolidated into four tanks. The waste was allowed to separate into two phases. After the phase separation was complete the aqueous phase was removed and stored in separate tanks. The organic phase liquid was decontaminated with a series of caustic washes that produced another aqueous layer. The new aqueous layer was removed and added to the aqueous tanks. There are two tanks of aqueous phase and two tanks of the organic phase. This sampling analysis plan (SAP) describes the characterization needed for this solvent and the aqueous phase to evaluate disposition requirements.

1.2 Purpose

This Sampling Analysis Plan (SAP) describes the process by which samples for characterization of the aqueous and organic liquid in tanks TK-26-1, TK-30-3, TK-27-3, and TK-28-3 will be obtained. The organic phase, consists of salts of HDEHPA, NPH, and TBP. The aqueous phase consists of low concentrations of Cs-137, Sr-90, and other elements that will be determined from analysis of the waste.

This sampling plan complies with requirements for program/project work plans incorporating the requirements of quality assurance program/project plans (QAPPs) as discussed in the Hanford Analytical Services Quality Assurance Plan (DOE/RL94-55, Rev.0 1994).

The data from the sampling event will be used to characterize the waste and provide information to support the wastes final disposition.

1.3 Scope

This SAP involves activities associated with collecting the waste samples and transferring the samples to the 222S lab for analysis. The activities associated with collecting the waste sample include:

1. Analysis requirements
2. Pre-sampling activities
3. Sample collection
4. Sample transport to 222S lab.

2.0 Organizational Responsibilities

2.1 B Plant Regulatory Compliance

Characterize the organic and aqueous phase waste based on sample data summaries supplied by Transition Engineering.

2.2 B Plant Transition Engineering

B Plant Transition Engineering supports the sampling effort by:

1. Issuing process memorandums and procedures
2. Assuring sampling kits are built and cleaned per the appropriate procedure
3. Providing required blanks to operations
4. Assuring that documentation is in place for sampling (log book, initiation of chain-of-custody for blanks, etc.)
5. Data analysis review
6. Providing engineering and technical support
7. Transmit Request for Special Analysis (RSA) to 222S lab before samples are transported.

2.3 B Plant Transition Operations

B Plant Transition Operation supports the sampling effort by:

1. Building sampling kit(s) per the appropriate procedure
2. Assuring that documentation is in place for sampling (log book, initiation of chain-of-custody for samples, etc.)
3. Operation of sampling equipment
4. Sample logbook entries
5. Transferring custody of the samples to Compliance, Sampling, and Support Operations (CSSO).

2.4 B Plant Health Physics Organization

Provides Radiation Control Technicians (RCTs) for radiological surveys associated with sampling activities and shipping.

2.5 Compliance, Sampling, and Support Operations (CSSO)

CSSO will be responsible for ensuring proper sample transportation between B Plant and 222S Laboratory. The sample truck driver is responsible for receiving the samples from B Plant, transporting them to the 222S Laboratory and completing the chain-of-custody forms for all sample transfers.

2.6 222S Laboratory

The 222S Laboratory will conduct the sample analysis according to this SAP. The responsibilities for the 222S Laboratory are discussed in the 222S Laboratory QAPP (QUALITY ASSURANCE PROGRAM PLAN FOR LABORATORY ANALYSES AND PROCESS TRAINING WHC-SD-CP-QAPP-016, REV. 0). Analyses of samples may be performed by Battelle Pacific Northwest Laboratory for those analytes which 222S Laboratory does not have capability.

Data deliverables shall be in the form of a written report. The report shall provide the data defined in Tables 1 and 2. In addition to requirements defined within this SAP, the report shall provide the following:

1. Detection limit or estimated minimum detectable activities (radiochemistry)
2. Method type for those not defined in Tables 1 and 2 or deviations from those defined
3. Report on preparation blank
4. Chromatogram showing manual integration of baseline
5. Interelement correction factors.

2.7 1706 KE Laboratory

The 1706 KE Laboratory will be responsible for cleaning the sampling kits per direction from B Plant Transition Engineering.

3.0 Aqueous Sampling and Analysis

3.1 Sampling Equipment

B Plant currently utilizes an air lift sampling system. The air lift principle is used in addition to air jet circulation because solutions of high specific gravity must be raised approximately 29 to 33 feet. This could not be done by means of the air jet alone. The sampler delivers a representative portion of the solution contained in the process tank.

An air jet, operating at 90 psi air pressure, draws solution from the cell vessel, circulates it through the sampler cup, and discharges it back into the tank. The air lift is a line that is tied into the suction side of the sampler at an elevation near the top of the tank.

The other end of the line terminates in the sampler box and is capped with a 1/64 inch orifice that allows air in. The air jet creates a vacuum in the sample cup that varies between 5 inches and 20 inches of mercury. This fluctuation is a result of the "slugs" of air introduced via the air lift, and solution from the tank moving along through the sampler.

3.2 Sampling Procedure

Procedure (B0-080-020), "Prepare For and Perform Protocol Bulk Sampling of Process Solutions," will be used to build sample kits and obtain a sample from the aqueous phase using the equipment described in section 3.1.

3.3 Limitations

One sample will be taken to represent both tanks due to sufficient process knowledge on waste stream and As Low As Reasonably Achievable (ALARA) concerns. Equivalent volumes of solution will be transferred to tank TK-25-2 and adjustments made for corrosion specifications. The sample will be taken while the solution is being agitated.

3.4 Sampling Parameters

A set of analytical parameters has been established by Tank Farms to characterize and quantify the boundary conditions for characterizing waste. Based on process knowledge, the waste matrix is comprised of mainly water. The Data Quality Objective (DQO) Process was used to evaluate the analyses requirements of the Double Shell Tank (DST) Waste Analysis Plan (WAP), WHC-SD-WM-EV-053, Rev 2 (Appendix A). Only one sample will be taken with a volume of 75 milliliters.

The analyses for characterization of the aqueous phase sample are described in Table 1. The waste characterization of the aqueous phase samples will be analyzed following 222S Laboratory process sample procedures.

3.5 Data Quality Criteria

The Data Quality Criteria (DQC) are based on the purpose of the analytes (Table 1) chosen for this sample. The DQCs were determined before the sampling event and were derived from the decisions that must be made once analytical data is received from the laboratory and evaluated. The analytes chosen are required to meet DST WAP and Tank Farm Data Quality Objectives Compatibility requirements.

The data collected pursuant to this SAP will be used to determine if the aqueous phase waste meets the acceptance requirements in the DST WAP. Table 1 identifies the minimum quantitation levels, 222S Laboratory method type and procedure number, and action limit for each analyte.

3.6 Quality Assurance/Quality Control

A set of analytical parameters have been established to characterize and quantify the boundary conditions for receiving waste in the DSTs. The DST boundary conditions and characterization are discussed in the DST WAP.

Due to the expected low concentration of the majority of analytes listed in Table 1 a matrix spike/matrix spike duplicate shall be analyzed with every sample for analytes capable of being spiked. The percent recovery criteria from the matrix spike are 75% and 125%. The relative percent difference between the matrix spike and its duplicate shall be $\pm$20% for those analytes capable of being spiked. When analytes are not able to be spiked, the accuracy limits will apply to the laboratory control standard. Tracers and carriers may be substituted for spikes in radiochemical methods if performance criteria for accuracy has been established against which to evaluate the observed data. Parameters pH, and specific gravity as well as parameters requiring method types of GEA, DSC or TGA shall be analyzed in duplicate.

3.7 Transportation

Transportation of the sample from B Plant to 222S Laboratory will be done in compliance with CSSO procedures.

3.8 Sample Custody

Each sample is tracked from collection until delivery to the 222S Laboratory by a chain-of-custody form. Standardized chain-of-custody forms will be used. The pertinent portions of the forms are filled out in the field after the sample has been packaged. Information recorded on the chain-of-custody form includes the identity of the person in custody of the sample, sample identity, and the time and date of any transfer of custody.

4.0 Organic Sampling and Analysis

4.1 Sampling Equipment

B Plant will utilize an assembly consisting of pipe with a dip sampler attached to the end. The assembly will be lowered into the tank by the B Plant canyon crane. The crane will lift the assembly from the tank and move it away from the cell to where an operator can release the sample into a sample bottle.

4.2 Sampling Procedure

A procedure will be developed using the equipment described in section 4.1.

4.3 Limitations

Three 50 to 70 milliliter samples from two tanks will be taken. The waste has been uniformly mixed during consolidation and decontamination. Storing the waste in two similar tanks because of volume limitations will not cause the characteristics of the wasted stored in one tank to differ from that in the other tank.

4.4 Analytical Parameters

The DQO Process was utilized to determine the analytical parameters for the organic phase (Appendix A). The parameters selected were based on requirements of the Department of Transportation Low Specific Activity Levels, and information required by a disposal facility. Diversified Scientific Services, Inc. supplied a waste profile sheet as a potential disposal facility. Two samples from the tanks shall be analyzed for all analytical parameters. The third sample will be archived at the 222S Laboratory for up to 6 months following delivery of the data package.

The analysis set for the waste characterization of the organic phase will be described in Table 2. The waste characterization samples will be collected and analyzed following the SW-846 protocols (or equivalent technology) when practical. SW-846 extraction procedures are not directly applicable to the organic sample therefore, the organic sample may require special treatment or the equipment parameters may need to be modified. The analysis will be conducted at the 222S Laboratory. Analysis results will be forwarded to B Plant in a summary data package. Preliminary data will be provided as available if requested. The most essential data are the radiological parameters which are needed as soon as possible after receiving the sample. As part of the data package include an estimated mass balance and a discussion of the mass balance.

4.5 Deviations from Protocol

Deviations from SW-846 from analyses are discussed in, Deviations from Approved EPA Methods at Hanford Site Laboratories, WHC-SD-WM-LB-009.

Chapter 9 of SW-846 discusses methods and protocols for preparing and executing waste sampling. There are several of these protocols that can not be met while collecting samples and analyzing from the B Plant facility. The deviations from the protocols are discussed below and will be documented in the final laboratory report.

4.5.1 Sampling Equipment Protocol Deviations

The sampling equipment used in the B Plant canyon to collect radioactive samples from the process tanks can not meet the Resource Conservation and Recovery Act (RCRA) protocol requirements for cleanliness during sample collection. The use of the specialized sampling equipment is required for sampling to reduce the exposure of personnel to radioactivity. Manual sample collection methods outlined in SW-846 could result in the sample team receiving a harmful radiation dose presenting ALARA concerns. The pipe assembly used for sampling will not be RCRA cleaned. However, the dip sampler that attaches to the pipe assembly will be RCRA cleaned.

4.5.2 Logbook Entries

Chapter 9 of SW-846 requires a logbook to serve as a legal record of the sampling effort. At the B Plant facility, the sampling will be done inside a radiation zone. If the logbook accompanies the samplers into a contaminated area it could become contaminated. Contaminated material must remain in a radiation zone, thus a contaminated logbook could only be stored and inspected inside of a radiation zone.

To avoid this situation, a data sheet will be used for recording the specific logbook entries inside the contaminated area. If the data sheet is not contaminated, it will be attached to the logbook. If the data sheet is contaminated, the information can be transcribed to a non-contaminated data sheet and attached to the logbook with a note stating what has happened. The use of data sheets will avoid the possibility of maintaining and storing a radioactive legal record.

Chapter 9 of SW-846 requires that specific information be included in logbook entries. The information that will be recorded on the data sheet includes: location sample is obtained; purpose of sample; sampling method description; type of process producing waste; type of waste; suspected waste composition; number of samples; volume of sample; sample identification number. Known information will be recorded on data sheet prior to entry to contaminated area. Any deviations will be noted.

4.5.3 Sample Seals

Chapter 9 of SW-846 requires the use of sample seals to detect unauthorized tampering of samples from the time of collection until the time of analysis. This section also recommends that the sample seals include the sample number, name of sample collector, date and time of sampling, and place of sample collection. The use of sample seals with the information required by SW-846 would overwhelm the physically small sample bottles. To meet the intent of the sample sealing requirement, tamper-indicating tape or labels will be placed on the exterior seal of the sample shielded container. The tamper-indicating tape or label is a commercially available product that indicates any tampering.

4.5.4 Use of Shielded Containers

Shielded containers are required for the bulk sample shipments between B Plant and the 222S Analytical Laboratory in order to meet the shipping requirements for radioactive materials. The sample bottles shipped are placed directly into the shielded container. When the shielded container is used, it will not be possible to inspect the sample bottle during the chain-of-custody transfer between B Plant and the B-Plant sample truck. This is a violation of the chain of custody protocol. When the shielded container is used, the inability to inspect the seals and labels at the time of transfer and the use of the shielded container will be recorded. This information will be recorded either on the chain-of-custody form or in the CSSO log book.

4.5.5 Preservatives and Sample Holding Time

Preservatives will not be used. The waste is not expected to have biological activity due to the radioactive environments. SW-846 Method 6010 requires nitric acid to be used during the sampling. Due to type of sampling equipment and exposure concerns the above condition will not be met.

Because of additional sampling handling procedures in the laboratory to avoid exposure to excessive radiation dose, extra time is needed to perform all analyses. As a consequences, sample holding times less than seven days are likely to be exceeded. An attempt will be made to achieve longer holding times with deviations discussed in the report.

4.5.6 Sample Volumes

The excessive time needed to obtain the sample volumes required by SW-846 in a radiation zone could result in the sample team receiving radiation doses inconsistent with ALARA practices. Therefore, only the volume needed to complete analysis will be taken during a sampling event.

Due to radiation exposure concerns, the amount of sample used during analyses will also be minimized.

4.6 Internal Quality Checks

A field blank will be used to document the accuracy and precision of the sampling. The field blank will be exposed to canyon conditions while the sample is taken. Exposing the sample to the tank is not an option due to the radioactivity of the waste. This blank is prepared and sealed during sampling and will accompany the organic samples to the 222S Laboratory. Field blanks are used to detect contamination or cross-contamination that occurs during sample handling and shipment.

Due to ALARA concerns, the field blank bottle will be the same type of bottle used in the organic sampling kits.

4.7 Data Quality Criteria

The Data Quality Criteria (DQC) are based on the purpose of the analytes chosen for this sample. The DQCs were determined before the sampling event and were derived from the decisions that must be made once analytical data is received from the laboratory and evaluated.

The data collected pursuant to this SAP will be used to determine recommendations for the disposition of the organic waste. Table 2 identifies SW-846 analytical method, the minimum quantitation levels, 222S Laboratory method type and procedure number, and action limit for each analyte.

4.8 Quality Assurance/Quality Control

The unique matrix of this waste necessitates the establishment of project objectives for the minimum quantitation level (MQL), and completeness of each parameter. Table 2 provides the preliminary targets for these standards. SW-846 analytical method are listed as guidance for the which 222S will select analytical procedures with an equivalent technical basis and selection will be documented in the final laboratory report. For those parameters with more than one available method, the laboratory may use the one that is best suited to meet the QA data objectives for that sample.

Due to the expected low concentration of the majority of analytes listed in Table 2 a matrix spike/matrix spike duplicate shall be analyzed with every sample for analytes capable of being spiked. The percent recovery criteria from the matrix spike are 75% and 125%. The relative percent difference between the matrix spike and its duplicate shall be $\pm$20% for those analytes capable of being spiked. When analytes are not able to be spiked, the accuracy limits will apply to the laboratory control standard. Tracers and carriers may be substituted for spikes in radiochemical methods if performance criteria for accuracy has been established against to evaluate the observed data. Parameters pH, and specific gravity as well as parameters requiring method types of GEA, DSC or TGA shall be analyzed in duplicate.

4.9 Transportation

Transportation of the sample from B Plant to 222S Laboratory will be done in compliance with CSSO procedures.

4.10 Sample Custody

Each sample is tracked from collection until delivery to the 222S Laboratory by a chain-of-custody form. Standardized chain-of-custody

forms will be used. The pertinent portions of the record are filled out in the field after the sample has been packaged. Information recorded on the chain-of-custody form includes the identity of the person in custody of the sample, sample identity, and the time and date of any transfer of custody.

5.0 Health and Safety

The major health and safety concern will be the possible spread of radioactive contamination and dose rate. All activities performed under this SAP will be done in accordance with appropriate health and safety requirements.

6.0 References

EPA, 1986, Test Methods for the Evaluation of Solid Wastes, SW-846, 3rd edition, U. S. Environmental Protection Agency, Washington, DC.

WHC, 1989, Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Mixed Waste Samples in Support of the Environmental Activities on the Hanford Site, WHC-SD-CP-QAPP-002, Westinghouse Hanford Company, Richland, WA.

Moront, P., Deviations from Approved EPA Methods at Hanford Site Laboratories, WHC-SD-WM-LB-009, Rev 1, Westinghouse Hanford Company, Richland, WA.

WHC, 1994, Double Shell Tank Waste Analysis Plan, WHC-SD-WM-EV-053, Rev. 2, Westinghouse Hanford Company, Richland, WA.

WHC, 1991, B PLANT WASTE ANALYSIS PLAN, WHC-SD-WM-TI-438, Rev. 1, Westinghouse Hanford Company, Richland, WA.

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Action Level
1-Butanol	0.5 mg/l	VOA	LA-523-405	25 mg/l
2-methyl-1-propanol	--	VOA	LA-523-405	170 mg/l
2-butanone	0.5 ppm	VOA	LA-523-405	36 mg/l
4-methyl-2-pentanone	0.5 ppm	VOA	LA-523-405	33 mg/l
1,1,1,2-tetrachloroethane	--	VOA	LA-523-405	6 mg/l
1,1,2,2-tetrachloroethane	--	VOA	LA-523-405	6 mg/l
Trichloroethylene	--	VOA	LA-523-405	6 mg/l
Acetone	0.5 mg/l	VOA	LA-523-405	160 mg/l
Aluminum	5 ug/ml	ICP	LA-505-151 LA-505-161	Np
Americium 241	0.005 uCi/ml	AEA	LA-953-103	>0.01 ug/ml
Cadmium	0.1 ug/ml	ICP	LA-505-151 LA-505-161	1 ug/ml
Carbonate	--	TIC	LA-522-102	Np
Cesium-137	1 uCi/ml	GEA	LA-548-121	Np
Chloride	10 ug/ml	IC	LA-533-105	Np
Chromium	0.01 ppm	ICP	LA-505-151 LA-505-161	0.86 mg/l
Cyanide	--	Micro Distillation	LA-695-102	Np
Energetics	0 J/gm	Net Exo. Energy	LA-514-113	> 0 kcal/gm
Fluoride	1 ug/ml	IC	LA-533-105	Np
Hydroxide	250 ug/ml	Titration	LA-211-102	≥.8M or ≤.1M
Iron	--	ICP	LA-505-151 LA-505-161	Np
Lead	0.1 ppm	ICP	LA-505-151 LA-505-161	0.37 mg/l
Moisture,%	--	TGA	LA-560-112 LA-514-114	Np
Nickel	0.02 ppm	ICP	LA-505-151 LA-505-161	5.0 mg/l

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Action Level
Nitrate	10 ug/ml	IC	LA-533-106	>.11 M <5.5 M
Nitrite	10 ug/ml	IC	LA-533-106	<1.0 M
pH	--	Glass Electrode	LA-212-102	Np
Phosphate	10 ug/ml	IC	LA-533-106	Np
Plutonium 239/240	0.005 uCi/ml	AEA	LA-943-127	>0.84 ug/ml
Sep. Organic	--	Visual Observation	LA-519-151	presence
Silver	0.01 ppm	ICP	LA-505-151 LA-505-161	0.30 mg/l
Sodium	0.020 ug/ml	ICP	LA-505-151 LA-505-161	Np
Solid, %	--	--	LA-564-101	Np
Specific gravity	--	Calibrated Pipet	LA-519-174 LA-510-112	1.3
Strontium-90	0.001 uCi/ml	Separation and Beta Prop. Count	LA-220-101	Np
Sulphate	10 ug/ml	IC	LA-533-106	Np
TOC	100 ug/ml	Furnace Oxidation Coulometric Titration	LA-344-106	Np
Total Beta	0.01 uCi/ml	--	LA-508-101	Np
Total Alpha	0.001 uCi/ml	--	LA-508-101	100 nCi/g
U Total	0.1 ug/ml	--	LA-926-009	Np
Viscosity	--	--	LA-519-321	

[a] = MQL is the lowest level (concentration, change in energy) that can be detected.
Np = Action levels not provided.
-- = Information currently not provided.

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Vol of Sample	Action Level
Americium 241	none	0.001 uCi/ml	AEA	LA-943-127	10 ml	Np
Ash %	none	.01%		ASTM482-80	5.0 ml	.1 %
Barium	6010A	50 ug/ml	ICP	LA-505-151 LA-505-161	10.0 ml	100 ug/ml
Cadmium	6010A	0.1 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	1 ug/ml
Cesium-137	none	1 uCi/ml	GEA	LA-548-121	22.0 ml	Np
Chromium	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
D2EHPA	3580A	1%	GC	LA-523-133	7 ml	Np
Energetics	none	0 J/g	DSC (in air)	LA-514-113	<1.0 ml	> 0
Lead	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
Moisture %	none	5%	TBD	TBD	1 ml	Np
Neptunium 237	none	0.0001 uCi/ml	AEA	LA-933-141	3 ml	Np
NPH	3580A	5%	GC	LA-523-133	7 ml	Np
Particle Size	none	--	Particle Size Analyzer or Microscopy or 1/32 inch screen	LT-519-101 TBD	5.0 ml	1/32"
Plutonium 239/240	none	0.005 uCi/ml	AEA	LA-943-127	10.0 ml	Np
Sodium						
Specific Gravity	none	--	Mass/Volume	LA-510-112	0.5 ml	Np
Strontium 90	none	0.001 uCi/ml	--	LA-220-101	5.0 ml	Np
TBP	3580A	1%	G.C.	LA-523-133	7 ml	Np
Water Solub.	none	--	Miscibility Test	ASTMD5058-90/C	5.0 ml	Np
U Total	none	0.1 ug/ml		LA-925-009	0.5 ml	Np

[a] = MQL is the lowest level (concentration, change in energy) that can be detected
b = or PNL procedure

Np = Action levels not provided
-- = Information currently not provided
h = Represents a group of parameters whose total volume is 10 ml.(The 10 ml is assigned to Barium)
TBD = To be determined

APPENDIX A

DATA QUALITY OBJECTIVE PROCESS FOR SELECTION OF ANALYTES FOR THE ORGANIC AND AQUEOUS PHASE WASTE

DATA QUALITY OBJECTIVE PROCESS FOR THE AQUEOUS AND ORGANIC SAMPLING ANALYSIS

Step 1: State the problem
Background information and scoping of the issues.

Final disposal of the aqueous and organic waste. Prior to the transfer of the aqueous phase to Tank Farms and disposition of the organic waste, analyte analysis is required.

Step 2: Identify the decision
The decision the study will resolve and the actions that may result.

A. Aqueous waste will be transferred to Tank Farms.

B. Disposition of the organics will be in two phases:

1. Remove organic waste from the canyon,
2. a. Possible disposal of the waste offsite or
   b. Onsite storage pending final disposal.

Step 3: Identify the inputs to the decision
Information and measurements that need to be obtained to resolve the decision statement.

A. Final disposal of the aqueous waste will be to the Double Shell Tank Farms. The aqueous list of analytes was based on requirements of the Double Shell Tank (DST) Waste Analysis Plan (WAP), WHC-SD-WM-EV-053, Rev 2. Meetings were held with representatives from Tank Farms to gain concurrence on the list of analytes.

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels a	Method Type	222S Lab Procedure	Action Level
Aluminum	5 ug/ml	ICP	LA-505-151 LA-505-161	Np
Americium 241	0.005 uCi/ml	AEA	LA-953-103	>0.01 ug/ml
Cadmium	0.1 ug/ml	ICP	LA-505-151 LA-505-161	1 ug/ml
Carbonate	--	TIC	LA-622-102	Np
Cesium-137	1 uCi/ml	GEA	LA-548-121	Np
Chloride	10 ug/ml	IC	LA-533-105	Np
Cyanide	--	Micro Distillation	LA-686-102	Np
Energetics	0 J/gm	Net Exo. Energy	LA-514-113	> 0 kcal/gm

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Action Level
Fluoride	1 ug/ml	IC	LA-533-105	Np
Hydroxide	250 ug/ml	Titration	LA-211-102	≥8M or ≤.1M
Iron	--	ICP	LA-505-151 LA-505-161	Np
Moisture,%	--	TGA	LA-560-112 LA-514-114	Np
Nitrate	10 ug/ml	IC	LA-533-105	>.11 M <6.5 M
Nitrite	10 ug/ml	IC	LA-533-105	<1.0 M
pH	--	Glass Electrode	LA-212-102	Np
Phosphate	10 ug/ml	IC	LA-533-105	Np
Plutonium 239/240	0.005 uCi/ml	AEA	LA-843-127	>0.84 ug/ml
Sep. Organic	--	Visual Observation	LA-519-151	presence
Sodium	0.020 ug/ml	ICP	LA-505-151 LA-505-161	Np
Solid,%	--	--	LA-564-101	Np
Specific gravity	--	Calibrated Pipet	LA-519-174 LA-510-112	1.3
Strontium-90	0.001 uCi/ml	Separation and Beta Prop. Count	LA-220-101	Np
Sulphate	10 ug/ml	IC	LA-533-105	Np
TOC	100 ug/ml	Furnace Oxidation Coulometric Titration	LA-344-105	Np
Total Beta	0.01 uCi/ml	--	LA-508-101	Np
Total Alpha	0.001 uCi/ml	--	LA-508-101	100 nCi/g
U Total	0.1 ug/ml	--	LA-925-009	Np
Viscosity	--	--	LA-519-321	

[a] = MQL is the lowest level (concentration, change in energy) that can be detected.
Np = Action levels not provided.
-- = Information currently not provided.

B. Transfer and final disposal of the organic may require a characterization of the waste. The list of analytes was based on process knowledge, Department of Transportation requirements, and a typical incinerator requirements.

Process knowledge was based on the drawing "Solvent Extraction Flowsheet for Strontium Recovery, (SK-2-22534)" taken from ARH-CD-691, Strontium Recovery from Purex Acidified Sludge, Section 2, dated May, 1970. Due to the potential for final disposal to an offsite incineration company, Diversified Scientific Services, Inc. (DSSI) was contacted to determine waste acceptance criteria. DSSI forwarded a waste profile sheet (Appendix B). DSSI was contacted by telephone to determine the preferred procedures for analyses. Meetings were held with representatives from 222S Laboratory to ensure that the lab had the capabilities to perform the requested analyses per DSSI procedures when practical.

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Vol of Sample	Action Level
Ash %	none	.01%		ASTM482-80	5.0 ml	.1 %
Barium	6010A	50 ug/ml	ICP	LA-505-151 LA-505-161	10.0 ml	100 ug/ml
Cadmium	6010A	0.1 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	1 ug/ml
Cesium-137	none	1 uCi/ml	GEA	LA-548-121	22.0 ml	Np
Chromium	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
D2EHPA	3580A	1%	GC	LA-523-133	7 ml	Np
Energetics	none	0 J/g	DSC (in air)	LA-514-113	<1.0 ml	> 0
Lead	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
Moisture %	none	5%	FTIR	Test Plan	1 ml	Np
NPH	3580A	5%	GC	LA-523-133	7 ml	Np
Particle Size	none	-	Particle Size Analyzer or Microscopy or 1/32 inch screen	LT-519-101 TBD	5.0 ml	1/32"

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	222S Lab Procedure	Vol of Sample	Action Level
Plutonium 238/240	none	0.005 uCi/ml	AEA	LA-943-127	10.0 ml	Np
Specific Gravity	none	--	Mass/Volume	LA-510-112	0.5 ml	Np
Strontium 90	none	0.001 uCi/ml	--	LA-220-101	5.0 ml	Np
TBP	3580A	1%	G.C.	LA-523-133	7 ml	Np
Water Solub.	none	--	Miscibility Test	ASTMD5058-90/C	5.0 ml	Np
U Total	none	0.1 ug/ml		LA-925-009	0.5 ml	Np

[a] = MQL is the lowest level (concentration, change in energy) that can be detected
b = or PNL procedure

Np = Action levels not provided
-- = Information currently not provided
h = Represents a group of parameters whose total volume is 10 ml.(The 10 ml is assigned to Barium)

TBD = To be determined

C. All activities associated with sampling activities will be done per approved procedures.

Step 4: Define the study boundaries
The specific time periods and spatial area related to the decision.

A. Sampling Analysis Plan is scheduled to be complete in mid November of 1995.

B. Samples are tentatively scheduled to be pulled in November of 1995 to January of 1996.

C. Transfer of organic from B Plant canyon to an outside storage tank is scheduled to be complete by August of 1996.

D. Transfer of aqueous waste to Tank Farms is undetermined.

E. Final disposal of organic waste is undetermined.

Step 5: Develop a decision rule
Relate all outputs into "if..then" statement for choosing between alternative decisions.

If results are not within the limits to complete the decision statement, then process development work may be required to reduce hazards.

Step 6: **Specify tolerance limits on decisions errors**
The decision maker's tolerable decision error rate based on consequence of incorrect decisions.

Error has been taken into account by setting the minimum quantitation levels, percent recovery criteria, and performing matrix spike/matrix spike duplicates.

Step 7: **Optimize the design**
Generate alternative data collection of designs and choose the most resource-effective design that meets all DQOs.

Develop a Sampling Analysis Plan for obtaining and analysis of the waste.

APPENDIX B

DSSI WASTE PROFILE SHEET

GENERATOR'S WASTE PROFILE SHEET INSTRUCTIONS

Return to: Diversified Scientific Services, Inc.
P.O. Box 863, Gallaher Road
Kingston, TN 37763
Attn: Customer Service

Introduction

1. This information is required for a waste to be considered for transportation, treatment, storage or disposal. It is used to determine if the waste may be transported, treated, stored or disposed of in a legal, safe and environmentally sound manner.

2. Answers to analytical questions may be made by actual analytical data or process knowledge. If possible, include an MSDS with the Profile Sheet.

3. This document may be copied for your convenience.

4. Answer ALL QUESTIONS. Call DSSI customer service at (615) 376-0084 if you need assistance. *Answers must be printed in ink or typed.*

5. Instructions are included to help you complete these forms correctly. The letters and numbers which precede each instruction refer to the lettered and numbered entries on the forms.

6. MAKE A COPY OF THE COMPLETED WASTE PROFILE SHEET FOR YOUR RECORDS. SEND THE ORIGINAL AND ATTACHMENTS TO THE ADDRESS SHOWN ABOVE OR TO THE ADDRESS PROVIDED BY THE DSSI CUSTOMER SERVICE DEPARTMENT.

Instructions for filling out DSSI's Waste Profile Sheet

Section Title: GENERAL INFORMATION

1. GENERATOR NAME: Enter the name of the generating facility.

   GENERATOR USEPA ID: Enter the twelve character alpha-numeric description issued by the USEPA to the facility generating the waste.

2. GENERATOR ADDRESS: Enter the street address (not P.O. Box), City, State and zip code of the generating facility. Indicate whether the billing address is the same as the generator address. If not, list the billing address including the name and phone number of a person who will answer questions regarding *billing* for services rendered.

3. TECHNICAL CONTACT: Enter the name and phone number of the person who will answer *specific* technical questions about the waste.

4. ALTERNATE CONTACT: Enter the name and phone number of the person who will answer *general* questions about the waste such as transportation scheduling, logistics, etc.

Section Title: PROPERTIES AND COMPOSITION

5. PROCESS GENERATING WASTE: List the specific process/operation or source that generates the waste. Be specific and descriptive. NOTE: a process is the method or way the waste was created. (e.g. stripping paint from

reactor, draining oil from turbine, radionuclide analysis, etc.) If the waste is generated from a CERCLA (i.e. Superfund) cleanup, indicate the name of the site and attach the CERCLA 104/106 order, Record of Decision or court order that governs site cleanup activities.

6. WASTE NAME: Enter a name that is generally descriptive of this waste (e.g. turbine oil, toluene or xylene scintillation cocktail, etc.).

7. a. USEPA Hazardous Waste: Indicate if this waste is a USEPA Hazardous Waste (40 CFR 261).

b. If the Waste is USEPA Hazardous: Identify ALL USEPA waste code numbers that apply.

State Waste Codes: If the state in which the waste was generated has issued specific waste codes other than RCRA codes, identify all state waste codes.

8. PHYSICAL STATE @ 70° F:

a. Physical State: Indicate whether the waste is a solid, liquid or both.

b. Layers: Indicate whether the waste is composed of two or more discernible layers(e.g. oil and water) or a single phase.

c. Free Liquids: If the waste contains both solid and liquid phases, indicate the free liquid content or range in percent.

d. Water: Specify percent.

e. Total Suspended Solids: Specify percent.

f. Total Dissolved Solids: Specify percent.

g. Viscosity: Specify viscosity and units (Saboit etc.) or give general description of the material (i.e. thick, thin, etc.)

9. a. pH: Enter the actual pH or the range. For aqueous waste, pH is measured directly. For non-aqueous waste pH should be measured using a 10% solution in water.

b. Strong Odor: DO NOT SMELL THE WASTE. If the waste has a known incidental odor, then describe it (e.g. acrid, pungent, solvent, sweet, etc) Check the MSDS or NIOSH Chemical Hazards Book for characteristic odor.

10. LIQUID FLASH POINT: Indicate the liquid flash point obtained using the appropriate testing method, process knowledge or MSDS (40 CFR 261.21).

11. CHEMICAL COMPOSITION: List all organic and/or inorganic components of the waste using *specific chemical names*. If trade names are used, attach Material Safety Data Sheets or other documents which adequately describe the material. For each component, indicate the approximate concentration (ranges are applicable) in percentage, parts per million (ppm), parts per billion (ppb), etc., in which the component is present. In cases of extreme pH (≤ 2.0 or ≥ 12.5), indicate the specific acid or caustic species present. THIS LIST MUST INCLUDE ALL COMPONENTS OF THE WASTE. THE TOTAL OF THE MAXIMUM VALUES OF THE COMPONENTS MUST BE GREATER THAN OR EQUAL TO 100%.

EXAMPLE

Constituents	Range	Units	Constituents	Range	Units
Oil	60-80	%	Water	3-18	%
Freon	10-20	%	Xylene	1-3	%
p-Cresol	6	%	Chloroform	50-600	ppm

12. OTHER: Fill in information and check box as applicable:

PCB's - Indicate the concentration of polychlorinated biphenyls (PCB) in the waste in parts per million. If the waste contains PCB is it regulated by 40 CFR 761.

Oxidizer - Indicate if the waste is capable of yielding oxygen readily to stimulate the combustion of organic material (49 CFR 173.151).

Pyrophoric - Indicate if the waste will spontaneously ignite in air at or below 130°F (54.5°C) (49 CFR 261.4(a)(4).

Explosive - Indicate if the waste is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement, a Class A explosive (49 CFR 173.53), or a Class B explosive (49 CFR 173.88).

Radioactive - Indicate if the waste contains radioactive material as defined in 10 CFR or 40 CFR 261.4(a)(4). If YES, complete the attached copy of DSSI Form C showing all isotopes, their concentration and estimated total amount of each that you wish to ship to DSSI. This total should be based on the anticipated volume entered on line 15.

Benzene -Indicate the benzene concentration in parts per million. If the waste contains Benzene is it regulated by 40 CFR 61.342.

Carcinogen - Identify any known carcinogens that are present in concentrations above 0.1 percent. List each known carcinogen and its concentration in the Chemical Composition Section above. See OSHA Hazardous Communication standard, 29 CFR 1910.1200 Appendix A(1) for carcinogens.

Infectious - Indicate if the waste is generated in connection with patient care or medical research or if it may be contaminated with pathological agents capable of inducing infectious and which has not been rendered harmless by sterilization or incineration.

Shock Sensitive - Indicate if the waste is normally unstable and readily undergoes violent change without detonating.

13. LAND DISPOSAL RESTRICTIONS: If the waste is subject to the land disposal restrictions (40 CFR 268) and meets the treatment standards of 40 CFR 268.41, 268.42 and/or 268.43, check the box and submit analytical data where applicable.

Section Title: SHIPPING INFORMATION

14. PACKAGING: Indicate the anticipated method(s) of shipment by checking the appropriate box(es). If drums are to be used, see 49 CFR 173 for DOT drum specifications.

OVERPACKED: (i.e. one shipping container in another) Indicate Yes or No.

15. ANTICIPATED WASTE VOLUME: Enter the amount of waste that will be generated and transported annually. Use appropriate units to describe this volume and the frequency which the waste may be shipped (e.g. weekly, quarterly, semi-annually, etc.).

CURRENT VOLUME IN INVENTORY: Enter the amount of waste that is currently in inventory at your facility awaiting shipment at this time. Use appropriate units to describe this volume.

Section Title: SAMPLING INFORMATION

This sample should be collected in accordance with "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods", SW846, USEPA, Office of Solid Waste, Washington D.C. 20460 and/or 40 CFR 261 - Appendix I. A substitute sample container for most wastes is a wide mouth glass bottle (safety coated) using a plastic cap with a non-reactive liner. Plastic containers are recommended for strong caustics or fluorides. Fill to approximately 90% of capacity to allow for expansion during transportation. Please complete the enclosed label and attach it to the sample container, not the shipping container. If there are any questions on sampling, such as required volumes, please contact DSSI Customer Service.

If this waste is a hazardous material, the sample must be packaged and shipped in accordance with USDOT regulations (49 CFR 171.2) and any specific requirements imposed by the carrier. Improperly packaged samples may be unsuitable for analysis and subsequent approval.

16. a. Sample Source: The sampler is to describe exactly from where the sample was taken (e.g. drum, pipe, pit, tank, vat, etc.). The sample date, the name of the person taking the sample and the company must be included.

b. Generator's Agent supervising sampling: Please identify the name of the person supervising the sampling.

17. NO SAMPLE REQUIRED: This will be determined by DSSI once we have reviewed the waste profile sheet. Questions concerning sample requirements should be directed to the DSSI Customer Service Department.

GENERATOR CERTIFICATION: *An authorized employee or agent (authorized in writing) of the generator must sign and date this certification on the completed Generator's Waste Material Profile. When an agent signs the Diversified Scientific Services, Inc. profile for the generator, please submit written documentation demonstrating that the generator has authorized the agent to sign the certification section of this profile.*

****

AT THIS POINT YOU CAN STOP AND SHIP A ONE LITER SAMPLE ALONG WITH THE COMPLETED FIRST PAGE OF THE PROFILE TO DSSI. THE SAMPLE WILL BE ANALYZED PER THE DSSI FUELS BLENDING ANALYSIS SPECIFICATION. THE BALANCE OF THE PROFILE WILL BE COMPLETED AND RETURNED TO YOU FOR REVIEW AND SIGNATURE. IF YOU ARE INTERESTED IN THIS OPTION PLEASE DSSI CONTACT CUSTOMER SERVICE FOR INSTRUCTIONS AND COST QUOTE.

18. Indicate if the waste is a WASTEWATER or a NONWASTEWATER. The waste must be either "wastewater" or "nonwastewater". "Wastewaters" are wastes that contain less than 1% by weight Total Organic Carbon (TOC) and are less than 1% by weight Total Suspended Solids (TSS) with the following exception: F001, F002, F003, F004, F005 solvent water mixtures that contain less than 1% by weight total F001 to F005 solvent constituents listed in 268.41 Table CCWE. Any waste that does not meet the applicable definition of "wastewater" is a "nonwastewater".

19. CALIFORNIA LIST RESTRICTIONS: If the waste is subject to any California List restrictions (which are not superseded* by an explicit waste-code related treatment standard (268 Subpart D), then the letter from Section 20 (D) below that corresponds to the status of the restriction must be inserted next to any applicable restrictions. For example, if a waste has any combination of HOC's (listed in Part 268 Appendix III and not listed in the treatment standard for this waste) that is greater than or equal to 1,000 ppm, then you would put "A" next to "HOCs". *Note: Acids have been replaced by the D002-Acid Subcategory treatment standard (after 8/8/90). Likewise, metals and cyanides generally have been replaced by the corresponding characteristic waste treatment standards.

20. WASTE IDENTIFICATION TABLE:

A. U.S. EPA Waste Codes: List all USEPA hazardous waste codes (both characteristic and listed codes) that correctly apply to this waste in this section. Waste codes should be entered on separate lines. A supplemental page is available if the waste has more than 10 codes. Waste codes that have identical subcategory and "applicable treatment standards" may be entered on the same line. For example, "F001, F003" may be entered on one line, since the same boxes will be checked under "Subcategory" and "Available Treatment Standards."

B. Subcategory: Next, identify the corresponding subcategory by either checking "NONE" or writing in the subcategory description. The waste codes that do have subcategories and the respective descriptions include:

D001: Ignitible Compressed Gas, Ignitible Liquid--Low TOC <10%, Ignitible Liquid--High TOC>/10%, Ignitible Reactive, or Oxidizer;

D002: Acid (pH\<2.0), Alkaline (pH>/12.5), or Other Corrosive ("Other Corrosive" means: Corrosive to SAE 1020 steel at a rate>/0.25 inch/year);

D006: Cadmium Batteries, or NONE;

D008: Lead Acid Batteries, or NONE;

D009: Nonwastewaters: (1) Organic High Mercury [>/ 260 ppm (with organic, not incinerated)]; or (2) Inorganic High Mercury >/260 ppm, or (3) Low Mercury (< 260 ppm); Wastewaters: NONE;

F001, F002, F003, F004, F005: Nonwastewaters: NONE, Wastewaters: Pharmaceutical, or Non Pharmaceutical;

C. Applicable Treatment Standards: Identify the corresponding treatment standards by putting an X in the applicable boxes. If the waste is subject to a specified technology requirement (40 CFR 268.42), enter the 5-letter treatment code from 40 CFR 268.42 Table 1 that correspond to the treatment required for the waste.

D. Management Under Land Disposal Restrictions: Using the six descriptions listed below, write the letter (A, B1, B2, B3, C, D, E), of the description that corresponds to the status of the waste under 40 CFR Part 268.7. If the waste is subject to a variance, then after entering "C" in column D, you must write the date of expiration of the variance (effective date of the prohibition) next to it in column D.

A. If the waste requires any treatment under 40 CFR Part 268, and/or RCRA Section 3004(d).

B.1 If the waste has been treated to meet the applicable standards found in 40 CFR Part 268.41 and/or 268.43.

B.2 If the waste is subject to the requirements of 40 CFR Part 268.42 (Specified Technology Treatment Standards), and the waste has been treated by that technology.

B.3 If the waste has been treated by incineration or fuels substitution to meet the applicable organic constituent standards found in 40 CFR Part 268.43, and these standards are based upon incineration or fuels substitution, and the treatment facility has been unable to detect the organic constituents despite using its best good-faith efforts (as defined by applicable EPA guidance or standards). See 40 CFR 268.43(c).

C. If the waste is subject to a national capacity variance, treatability variance, case-by-case extension, or a no-migration petition. If your waste is subject to a treatability variance or a case-by-case extension from the EPA, be sure to enter the date of expiration and if you have not sent a copy of the letter from the EPA with your profile, include it here.

D. If the waste naturally meets the treatment standards in 40 CFR Part 268.41 and/or 268.43 that are applicable. This does not apply to "specified technology wastes," 40 CFR Part 268.42.

E. If this waste is "newly identified" waste that is not currently subject to any 40 CFR Part 268 restrictions.

21. SOIL AND DEBRIS: Indicate if the waste is a soil and/or debris as defined in 54 FR 48489. Enter YES or NO in the appropriate box.

22. Specific Gravity: Indicate either the actual specific gravity or range. The specific gravity of water is 1.0. Most organics are less than 1.0 Chlorinated solvents, most inorganics, and paint sludge are greater than 1.0.

23. CYANIDES, SULFIDES, AND PHENOLICS: If the waste contains cyanides, sulfides, or phenolics indicate the concentrations(s). If the waste does not contain these constituents, check NONE in the respective box. For Cyanides, indicate whether the type is as reactive cyanides, free cyanides, total cyanides amenable to chlorination. For sulfides, indicate whether the type is reactive sulfides, free sulfides, or total sulfides.

24. COLOR: Describe the color of the waste by visual observation (e.g., blue, clear, etc.). If the waste is multicolored, describe it specifically. Physical Appearance-In addition to the waste descriptions identified in Section 8, Physical State, identify any other unique physical characteristic of the waste (i.e., powder, dusty, sublimes, gelatinous, fuming, vitreous, etc.).

25. FUELS OR INCINERATION: This section *MUST* be completed for wastes intended for fuels at DSSI. Indicate the range for each on a total basis.

26. RECLAMATION, FUELS, OR INCINERATION: This section *MUST* be completed for wastes intended for fuels at DSSI.

A. Indicate if this waste can be transferred by pumping at an ambient temperature of 80°F. If "YES," list the type of pump required (centrifugal, gear, peristaltic, etc.).

B. Indicate if an external sources of heat can be safely used to improve the flow of this waste.

C. Indicate if this waste is soluble in water.

D. Particle Size - If the waste contains any solids, indicate if they can pass through a 1/32" screen.

27. TRANSPORTATION INFORMATION:

A. DOT Hazardous Material: Indicate if this waste is a USDOT Hazardous material (49 CFR 172.101).

B. Proper Shipping Name: Enter the proper USDOT shipping name for this waste (49 CFR 172.101).

C. Hazard Class: Enter the proper USDOT hazard class (49 CFR 172.101).

D. Additional Description: Enter any additional shipping information required (49 CFR 172.203).

E. CERCLA Reportable Quantity (RQ): Enter the Reportable Quantity for this waste from 49 CFR 172.101 for 40 CFR 302.

28. SPECIAL HANDLING INFORMATION: Attach relevant documents as a part of your response if appropriate. If documents are attached, identify those attachments. Also include in this section any additional information that will aid in the management of the waste (e.g., protective clothing, transportation, treatment, storage, disposal).

29. OTHER INFORMATION: Please include any additional information that will facilitate the proper and safe management of the waste.

30. DIVERSIFIED SCIENTIFIC SERVICES CERTIFICATION: No entry necessary.

31. OTHER HAZARDOUS CONSTITUENTS: Indicate if the waste contains any of the metals listed. For arsenic through chromium (hexavalent), you must either check the appropriate box or enter the actual (ranges are acceptable) concentration. For antimony through zinc, enter the actual (ranges are acceptable) concentration, if known.

32. OTHER HAZARDOUS CONSTITUENTS: Indicate if the waste contains any of the organic compounds listed. For each organic compound, you must either check the appropriate box, or enter the actual (ranges are acceptable) concentration.

18. Check ONE: This Waste is a _____ Wastewater _____ Nonwastewater.

19. If this waste is subject to any California List restrictions enter the letter from below (either A or B.2) next to each restriction that is applicable:
___HOC's, ___PCB's, ___Acid, ___Metals, ___Cyanides

20. Identify ALL Characteristic and Listed USEPA hazardous waste numbers that apply (as defined by 40 CFR 261). For each waste number, identify the subcategory (as applicable, check none, or write in the description from 40 CFR 268.41, 268.42 and 268.43).

REF #	A. US EPA HAZARDOUS WASTE CODE(S)	B. SUBCATEGORY (ENTER THE SUBCATEGORY DESCRIPTION - IS NOT APPLICABLE, SIMPLY CHECK NONE)		C. APPLICABLE TREATMENT STANDARDS			D. HOW MUST THE WASTE BE MANAGED? (ENTER THE LETTER FROM BELOW)
				PERFORMANCE - BASED: (CHECK AS APPLICABLE)		SPECIFIED TECHNOLOGY (IF APPLICABLE ENTER THE 40 CFR 268.42 TABLE 1 TREATMENT CODE(S))	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

To list additional USEPA waste numbers and categories use additional page and check here:____

Management under the land disposal restrictions:

A. RESTRICTED WASTE REQUIRES TREATMENT

B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS

B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)

B.3 GOOD FAITH ANALYTICAL CERTIFICATION FOR INCINERATED ORGANICS

C. RESTRICTED WASTE SUBJECT TO A VARIANCE

D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT

E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS

21. Is this waste a soil and/or debris No: ____ Yes, Soil: ____ Yes, Debris: ____ Yes, Both: ____

22. Specific Gravity Range: _____ to _____

23. Indicate the range of each:

		Units		
Cyanides: _____	to _____	_____	None _____	Type (free, total, amenable, etc.) _____
Cyanides: _____	to _____	_____	None _____	Type (free, total, amenable, etc.) _____
Sulfides: _____	to _____	_____	None _____	Type (free, total, amenable, etc.) _____
Phenolics _____	to _____	_____	None _____	

24. Identify the waste color _____ and physical appearance _____

REF #	A. US EPA HAZARDOUS WASTE CODE(S)	B. SUBCATEGORY ENTER THE SUBCATEGORY DESCRIPTION - IF NOT APPLICABLE, SIMPLY CHECK NONE		C. APPLICABLE TREATMENT STANDARDS			D. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
				PERFORMANCE - BASED: CHECK AS APPLICABLE		SPECIFIED TECHNOLOGY IF APPLICABLE ENTER THE 40 CFR 268.42 TABLE 1 TREATMENT CODE(S)	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							

25. COMPLETE ONLY FOR WASTES INTENDED FOR FUELS OR THERMAL DESTRUCTION

	TOTAL
Beryllium as Be	ppm
Fluorine as F	%
Sodium as Na	%
Bromine as Br	%
Chlorine as Cl	%
Fluorine as F	%
Sulfur as S	%

26. RECLAMATION, FUELS or THERMAL DESTRUCTION PARAMETERS
(Provide if information is available)

RANGE

A. Heat Value (BTU/lb.) _____ - _____

B. Viscosity (cps): _____ @ _____ °F _____ 100°F _____ 150°F

C. Vapor Pressure @ STP (mm/Hg): _____

D. Is this waste a pumpable liquid? Yes ____ No ____

E. Can this waste be heated to improve flow? Yes ____ No ____

F. Is this waste soluble in water? Yes ____ No ____

G. Particle size: Will the solid portion of this waste pass through a 1/32 inch screen? Yes ____ No ____

27. TRANSPORTATION INFORMATION

A. Is this a DOT Hazardous Material? Yes ____ No ____

B. Proper Shipping Name: _____

C. Hazardous Class/ID#: _____

D. Additional Description: _____

E. CERCLA Reportable Quantity (RQ) (and units (lb, kg): _____

28. SPECIAL HANDLING INFORMATION

_____

_____

_____

_____

____ Additional Pages Attached

____ Material Safety Data Sheets Attached

29. OTHER INFORMATION

_____

_____

_____

_____

_____

30. DIVERSIFIED SCIENTIFIC SERVICES CERTIFICATION

Diversified Scientific Services, Inc. has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

31. OTHER HAZARDOUS CONSTITUENTS indicate if the waste contains any of the following. WHC-SD-WM-EV-108, REV 0

METALS	TCLP Data: Check only ONE for each constituent. Use units: ppm, mg/l					TCA or TOTAL. Use units: ppm, mg/l, mg/kg or percent			
						California List			Annual
	Less Than	TC Regulated Level	Equal or More	Waste No.	TCLP Actual	Less Than	Regulated Level	Equal or More	
Arsenic as As		5.0 mg/l		D004			500 mg/l		
Barium as Ba		100.0 mg/l		D005					
Cadmium as Cd		1.0 mg/l		D006			100 mg/l		
Chromium (Total) as Cr		5.0 mg/l		D007					
Lead as Pb		5.0 mg/l		D008			500 mg/l		
Mercury as Hg		0.2 mg/l		D009			20 mg/l		
Selenium as Se		1.0 mg/l		D010			100 mg/l		
Silver as Ag		5.0 mg/l		D011					
Nickel as Ni							134 mg/l		
Thallium as Tl							130 mg/l		
Chromium (hexavalent) as Cr+6							500 mg/l		
Antimony as Sb									
Beryllium as Be									
Copper as Cu									
Vanadium as V									
Zinc as Zn									

12. OTHER HAZARDOUS CONSTITUENTS Indicate if the waste contains any of the following.

ORGANICS	TCLP data: Check only ONE for each constituent					TCA or TOTAL Use units: ppm, mg/l or %
	Less Than	Regulated Level	Equal or More	Waste No.	TCLP Analytical Test Results Use Units: ppm or mg/l	
Benzene		0.5 mg/l		D018		
Carbon Tetrachloride		0.5 mg/l		D019		
Chlordane		0.03 mg/l		D020		
Chlorobenzene		100.0 mg/l		D021		
Chloroform		6.0 mg/l		D022		
m-Cresol		200.0 mg/l		D024		
o-Cresol		200.0 mg/l		D023		
p-Cresol		200.0 mg/l		D025		
Cresol		200.0 mg/l		D026		
2,4-D		10.0 mg/l		D016		
1,4-Dichlorobenzene		7.5 mg/l		D027		
1,2-Dichloroethane		0.5 mg/l		D028		
1,1-Dichloroethylene		0.7 mg/l		D029		
2,4-Dinitrotoluene		0.13 mg/l		D030		
Endrin		0.02 mg/l		D012		
Heptachlor, and its Hydroxide		0.008 mg/l		D031		
Hexachloro-1,3 butadiene		0.5 mg/l		D033		
Hexachlorobenzene		0.13 mg/kl		D032		
Hexachloroethane		3.0 mg/l		D034		
Lindane		0.4 mg/l		D013		
Methoxychlor		10.0 mg/l		D014		
Methyl Ethyl Ketone		200.0 mg/l		D035		
Nitrobenzene		2.0 mg/l		D036		
Pentachlorophenol		100.0 mg/l		D037		
Pyridine		5.0 mg/l		D038		
Tetrachloroethylene		0.7 mg/l		D039		
Toxaphene		0.5 mg/l		D015		
2,4,5-TP Silvex		1.0 mg/l		D017		
Trichloroethylene		0.5 mg/l		D040		
2,4,5-Trichlorophenol		400.0 mg/l		D041		
2,4,6-Trichlorophenol		2.0 mg/l		D042		
Vinyl Chloride		0.2 mg/l		D043		

TOTAL RADIOACTIVITY AND CONCENTRATION

PROFILE #_____

EXEMPT ISOTOPES	CONCENTRATION µCi/ml	TOTAL µCi
C-14		
H-3		
CATEGORY I ISOTOPES		
Au-195		
Bi-207		
Ca-45		
Cd-109		
Ce-141		
Cl-36		
Cr-51		
Cu-64		
Fe-55		
Fe-59		
Ga-67		
Gd-153		
Hg-203		
I-125		
I-131		
In-111		
Na-22		
P-32		
P-33		
Rb-86		
S-35		
Sc-46		
Se-75		
Sn-113		
Sn-119m		
Other_____		
Other_____		
CATEGORY II ISOTOPES		
Am-241		
Co-57		
Co-58		
Co-60		
Cs-134		
Cs-137		
Ga-68		
Mn-54		
Ni-63		
Tc-99		
Zn-65		
OTHER_____		
OTHER_____		

ANY ISOTOPE NOT LISTED ABOVE AND SNM OR SOURCE MATERIALS IS ON A CASE BY CASE BASIS.

THE ABOVE INFORMATION IS BASED ON: ANALYSIS___ ESTIMATE___

GENERATOR:_____ DATE:_____

AUTHORIZED SIGNATURE:_____

DIVERSIFIED SCIENTIFIC SERVICES, INC.

WASTE PROFILE WHC-SD-WM-EV-108, REV 0

Profile #

☐ Check here if this is a Reconfirmation

GENERAL INFORMATION

1. GENERATOR NAME: _____ Generator USEPA ID: _____
2. Generator Address: _____ Billing Address ☐ Same _____
3. Technical Contact/Phone: _____
4. Alternate Contact/Phone: _____ Billing Contact/Phone: _____

PROPERTIES AND COMPOSITION

5. Process Generating Waste: _____
6. Waste Name: _____
7. a. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☐ No ☐
   b. Identify ALL USEPA listed and characteristic waste codes (numbers) (D,F,K,P,U): _____
   _____ State Waste Codes: _____
8. Physical State @ 70°F: a. Solid ☐ Liquid ☐ Both ☐ b. Single Layer ☐ Multilayer ☐ c. Free Liquid Range _____ to _____ %
   d. Water ____% e. Total Suspended Solids ____% f. Total Dissolved Solids ____% g. Viscosity ____
9. a. pH: Range _____ to _____ or Not applicable ☐ b. Strong Odor ☐; describe _____
10. Liquid Flash Point: <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☐ Closed Cup ☐ Open Cup ☐
11. CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.

Constituent	Range	Units	Constituent	Range	Units

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

12. OTHER: PCBs ____ ppm. Regulated by 40 CFR 761 Yes ☐ No ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐
    Benzene ____ ppm. Subject to 40 CFR 61.342 Yes ☐ No ☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐
13. If the waste is subject to the land ban and meets the treatment standards check here: ☐ and supply analytical results where applicable.

SHIPPING INFORMATION

14. a. PACKAGING: Bulk Solid ☐ Bulk Liquid ☐ Drum ☐ Type/Size: _____ b. OVERPACKED Yes ☐ No ☐
15. ANTICIPATED ANNUAL VOLUME: _____ Units: _____ Shipping Frequency: _____
    CURRENT VOLUME IN INVENTORY: _____

SAMPLING INFORMATION

16. a. Sample source (drum, lagoon, pond, tank, vat, etc.) _____
    Date Sampled: _____ Sampler's Name/Company: _____
    b. Generator's Agent Supervising Sampling: _____ 17. ☐ No sample required (See instructions.)

GENERATOR'S CERTIFICATION

I hereby certify that all information contained in this and all attached documents contains all material characteristics of the waste. Any waste represented as nonhazardous as defined in 40 CFR 261, Appendix I or by state or local regulations. All relevant information regarding known or suspected hazards of the chemicals of the generator has been disclosed. I understand that a violation of this certification may subject me to penalties for violation of certification.

B-14

_____ _____ _____

Signature Printed (or typed) name and title Date