0047253

ENGINEERING CHANGE NOTICE

Page 1 of 2 3

1. ECN 630281

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [ ] Direct Revision [X] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	Monica M. Serkowski, 372-0074 B Plant Technical Support, 16F00	[ ] Yes [X] No	January 16, 1997
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	B Plant Organic Removal	221-B	E,Q
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
	WHC-SD-WM-EV-108, Rev.0	NA	NA

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[ ] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [ ] Yes [X] No

The document was revised to :
- reflect the new organizational change
- request additional analyses in the organic phase

MAY 1997 RECEIVED EDMC

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[ ]	Environmental	[ ]	Facility Deactivation	[ ]
As-Found	[ ]	Facilitate Const	[ ]	Const. Error/Omission	[ ]	Design Error/Omission	[ ]

14b. Justification Details

New potential storage/disposal facilities were identified. The changes were made to satisfy new waste acceptance criteria.

15. Distribution (include name, MSIN, and no. of copies)

E. R. Hafla	S6-70
E. D. Robbins	S6-70
M. M. Serkowski	S4-66
S. E. Killoy	S4-66
G. L. Miller	T6-06
C. H. Mulkey	R1-51
M. A. Hill	S4-66

RELEASE STAMP

DATE: JAN 23 1997 HANFORD RELEASE

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A-7900-013-2 (05/96) GEF095

A-7900-013-1

ENGINEERING CHANGE NOTICE	Page 2 of 83	1. ECN (use no. from pg. 1) 630281

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng.	E. R. Hafla	1/20/97	PE		
Cog. Mgr.	E. D. Robbins	1/20/97	QA		
QA	M. A. Hill	1.21.97	Safety		
Safety			Design		
Environ.	S. E. Killoy	1/20/97	Environ.		
Other	G. L. Miller	1/22/97	Other		
Other	C. H. Mulkey	1/20/97			

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION

ECN # 630281
Page 3 of 3

1. Identification Number: BT-97-014 | USQ SCREENING | Page 1 of 1

2. Title: Organic Phase and Aqueous Phase Sampling Analysis Plan WHC-SD-WM-EV-108, Rev. 1

INSTRUCTIONS: Respond to each question and provide justification for each response. A restatement of the question does not constitute a satisfactory justification or basis. An adequate justification provides sufficient explanation such that an independent reviewer could reach the same conclusion based on the information provided [DOE 5480.21, 10.a.1].

QUESTIONS

1. Does the proposed change or occurrence represent a change to the facility or procedures as described in the Authorization Basis?
   [] N/A [X] No [] Yes/Maybe

   BASIS: The change to the waste sampling analysis plan provides additional guidance in the waste characterization process. It does not represent a change to the facility or the procedure as describe in the Authorization Basis.

2. Does the proposed change or occurrence represent conditions that have not been analyzed in the Authorization Basis?
   [] N/A [X] No [] Yes/Maybe

   BASIS: The organic waste hazard condition and curie inventory have been well analyzed in the Authorization Basis. The proposed change to the waste sampling analysis plan after the organic washes will further indicate that the organic condition is within the safety boundary.

3. Does the proposed change represent a test or experiment NOT described in the Authorization Basis that may affect the safe operation of the facility?
   [] N/A [X] No [] Yes/Maybe

   BASIS: The proposed change in the waste characterization is neither a test or experiment.

4. Does the proposed change or occurrence represent a change to the Technical Safety Requirements or a reduction in the margin of safety defined in the Technical Safety Requirements?
   [] N/A [X] No [] Yes/Maybe

   BASIS: No changees to the Technical Safety Requirements or reduction in the margin of safety are resulted by this proposed change.

USQE #1 Monica M. Serkowski (Print Name)
Monica M. Serkowski Signature Date: 1/16/97

USQE #2 Fen M. Simmons (Print Name)
Fen M. Simmons Signature Date: 1/17/97

If there is a YES/MAYBE response to questions 1, 2, 3, or 4, then a USQ Evaluation must be completed.

The following guidance should be considered when completing this screening. This guidance should not be considered all-inclusive; additional factors may need to be considered depending on the nature of the proposed change.

Does the proposed change:

1) Modify, add, or delete a safety class function of a structure, system or component stated in the authorization basis?
2) Alter the design of a structure, system or component as described in the authorization basis?
3) Modify, add, or delete the description of operation, operating environment, or analyses of any system or component described in the authorization basis?
4) Modify, add, delete or conflict with any of the design bases stated in the authorization basis?
5) Conflict with the principle or general design criteria stated in the authorization basis?
6) Modify, add, or delete any plant design features described in the authorization basis?
7) Modify, add, or delete a flow diagram or facility drawing provided in the authorization basis?
8) Create the potential for new system or component interactions (e.g., seismic, electrical breaker coordination)?

Organic Phase and Aqueous Phase Sampling Analysis Plan

Evan R. Hafla
Babcock and Wilcox Hanford Company
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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Org Code: 16D00 Charge Code: KN34C
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Key Words: Organic, Aqueous, SAP, B Plant, Sampling, Characterization

Abstract: This Sampling Analysis Plan describes the process by which samples for characterization of the aqueous and organic phase at B Plant are taken and analyzed.

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Release Stamp

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RECORD OF REVISION	(1) Document Number WHC-SD-WM-EV-108 Rev.1	Page A

(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	(7) EDT #602048	E. R. Hafla	K.A. Jennings-Mills
~~RS~~ 1	ECN #630281	E. R. Hafla	E. D. Robbins

WHC-SD-WM-EV-108, REV 1

Organic Phase and Aqueous Phase Sampling Analysis Plan

Prepared By: E. R. Hafla, Engineer
B Plant Canyon Decontamination and Decommissioning

January 1997

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APPENDIX A Data Quality Objective Process for Selection of Analyses for the Organic and Aqueous Phase Waste A-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-2-ethylhexyl phosphoric acid (D2EHPA) 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 D2EHPA, NPH, and TBP. The aqueous phase contains 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 plans (QAPPs). Quality control will conform to the Hanford Analytical Services Quality Assurance Plan (DOE/RL94-55, Rev.2 1995) when the quality control criteria for an analysis is not provided in this Sample and Analysis Plan.

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 the B Plant Canyon Decontamination and Decommissioning.

2.2 B Plant Canyon Decontamination and Decommissioning

B Plant Canyon Decontamination and Decommissioning engineering staff 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.

B Plant Canyon Decontamination and Decommissioning operation staff 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).

2.3 B Plant Health Physics Organization

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

2.4 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 sample transfers.

2.5 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. Analyses of samples may be performed by Pacific Northwest National Laboratory (PNNL) or other laboratory for those analyses 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.

2.6 WSCF Laboratory

The WSCF Laboratory will be responsible for cleaning the sampling kits per direction from B Plant Canyon Decontamination and Decommissioning.

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 (BO-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. The Resource Conservation and Recovery Act (RCRA) sampling holding times and preservation procedures are not mandatory to the aqueous sampling. However, samples for VOA and semi-VOA should be refrigerated at the lab.

3.3 Limitations

One sample event consisting of two bulk samples will represent both tanks due to sufficient process knowledge on the 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 per procedure BO-080-020.

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, (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 analyses (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 analyses 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 analyze.

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 analyses listed in Table 1, a matrix spike duplicate shall be analyzed with every sample for analyses capable of being spiked. The percent recovery criteria from the matrix spike are 75% to 125%. The relative percent difference between the matrix spike and its duplicate shall be ±20% for those analyses capable of being spiked. When analyses are not able to be spiked, the accuracy limits will apply to the laboratory control standard and precision will be evaluated on the performance of sample duplicates. The relative percent difference between samples and their duplicates shall be ± 20%. One rerun will be performed if a precision or accuracy analysis fails to meet the quality control limit. 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 will be tracked from collection until delivery to the 222S Laboratory by a Request for Special Analysis (RSA) and sample handling log book entries or a chain-of-custody form. 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 to obtain a representative portion of the tank

contents. 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

Four 50 to 70 milliliter samples from two tanks will be taken. Two samples from the tanks shall be analyzed for all analytical parameters. The other two samples will be archived, either at the 222S or PNNL laboratories, for up to 6 months following delivery of the data package. 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 meeting the Department of Transportation requirements, and information required by several storage/disposal facility. Diversified Scientific Services, Inc. supplied a waste profile sheet as a potential disposal facility. Additional parameters were added as required by the Waste Experimental Reduction Facility (WERF) Incinerator operated by Lockheed Martin Idaho Technologies at the Idaho National Engineering Laboratory. Rust Federal Services of Hanford, Inc. also provided its waste acceptance criteria.

The analysis set for the waste characterization of the organic phase is 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, PNNL or other laboratories. Analysis results will be forwarded to B Plant in a complete 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. The data package shall include an estimated mass balance and a discussion of the mass balance.

4.5 Deviations from Protocol

Potential deviations from SW-846 for 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 protocols that can not be fully met while collecting and analyzing samples 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 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, the bottles and other contact equipment 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 B Plant Operation's logbook. If the data sheet is contaminated, the information can be transcribed to a non-contaminated data sheet and attached to the B Plant Operation's 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 on the data sheet and transcribed into the logbook.

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 lab. 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 highly radioactive environment. SW-846 Method 6010 requires nitric acid to be used during the sampling. Due to the type of sampling equipment and exposure concerns the above condition will not be met.

Because of specialized sample handling procedures in the laboratory to avoid exposure to excessive radiation dose, sample holding times less than seven days are likely to be exceeded. Such deviations from SW-846 specified sample holding times are acceptable. Effort should be made to meet the holding time requirment as close as possible. Deviations shall be discussed in the data package narrative.

4.5.6 Sample Volumes

The time needed to obtain the sample volumes specified by SW-846 radiation zone could result in the sample team receiving excessive radiation doses and is in conflict 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 aliquot used for analyses may also be minimized. However, the resulting detection limit must be sufficiently lower than the action level specified in Table 2 to meet waste acceptance criteria.

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) were determined before the sampling event and were derived from the decisions that must be made once analytical data are received from the laboratory and evaluated.

The data collected according to this SAP will be used to determine the disposition of the organic waste. Table 2 identifies analytical methods, the minimum quantitation levels, and procedure number, and action levels for each analyte.

4.8 Quality Assurance/Quality Control

It is anticipated that the unique organic matrix of this waste may pose problems for analysis. However, the establishment of project objectives for the minimum quantitation level (MQL) are specified as desired targets for the Laboratory in Table 2. SW-846 analytical methods are listed as guidance for the laboratory, which will select analytical procedures with an equivalent technical basis and will document the procedures used 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 data objectives.

Due to the expected low concentration of the majority of analyses listed in Table 2 a matrix spike duplicate shall be analyzed with every sample for analyses capable of being spiked. The percent recovery criteria from the matrix spike are 75% to 125%. The relative percent difference between the matrix spike and its duplicate shall be ±20% for those analyses capable of being spiked. When analyses are not able to be

spiked, the accuracy limits will apply to the laboratory control standard and precision will be evaluated on the performance of sample duplicates. The relative percent difference between samples and their duplicates shall be ± 20%. One rerun will be performed if a precision or accuracy analysis fails to meet the quality control limit. 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.

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 exposure of personnel to radiation. 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, 1996, Double Shell Tank Waste Analysis Plan, WHC-SD-WM-EV-053, Rev. 4, Westinghouse Hanford Company, Richland, WA.

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

Resource Conservation and Recovery Act of 1976

Quality Assurance Program Plan for Laboratory Analyses and Process Training WHC-SD-CP-QAPP-016, Rev. 0

Fowler, 1995, Data Quality Objectives for the Waste Compatibility Program, WHC-SD-WM-DQO-001, Rev. 1, WHC, Richland, WA.

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels [a]	Method Type	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-tetrachloro ethane	–	VOA	LA-523-405	6 mg/l
1,1,2,2-tetrachloro ethane	–	VOA	LA-523-405	6 mg/l
Trichloro ethylene	–	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-622-102	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

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels [a]	Method Type	Procedure	Action Level
Nickel	0.02 ppm	ICP	LA-505-151 LA-505-161	5.0 mg/l
Nitrate	10 ug/ml	IC	LA-533-105	>.11 M <5.5 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-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-533-105	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-510-221	

[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	Procedure	Vol of Sample	Action Level
VOA'S						
Acetone	8240		VOA	PNL-ALO-335		
Benzene	8240		VOA	PNL-ALO-335		
1-Butanol	8240		HS	Test Plan		
2-Butanone	8240		VOA	PNL_ALO_335		
Carbon Tetrachloride	8240		VOA	PNL-ALO-335		
Chlorobenzene	8240		VOA	PNL-ALO-335		
Chloroform	8240		VOA	PNL-ALO-335		
1,4-Dichloro benzene	8240		SVOA	PNL-ALO-120/345		
1,2-Dichloro ethane	8240		VOA	PNL-ALO-335		
4-Methyl-2-pentanone	8240		VOA	PNL-ALO-335		
2-Methyl-1-propanol	8240		VOA(as TIC) HS	PNL-ALO-335		
Methylethyl ketone	8240		VOA	PNL-ALO-335		
Pyridine	8240		SVOA	PNL-ALO-120/345		
1,1,1,2-Tetra chloroethane	8240		VOA	PNL-ALO-335		
1,1,2,2-Tetra chloroethane	8240		VOA	PNL-ALO-335		
Tetrachloro ethylene	8240		VOA	PNL-ALO-335		
Trichloro ethylene	8240		VOA	PNL-ALO-335		
Vinyl Chloride	8240		VOA	PNL-ALO-335		
SEMI-VOAs						
Cresol	8250/8270		Semi-VOA	PNL-ALO-120/345		
p-cresol	8250/8270		Semi-VOA	PNL-ALO-120/345		
m-Cresol	8250/8270		Semi-VOA	PNL-ALO-120/345		
o-Cresol	8250/8270		Semi-VOA	PNL-ALO-120/345		

Table 2: ORGANIC PHASE QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION						
Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	Procedure	Vol of Sample	Action Level
2,4-Dinitro toluene	8250/8270		Semi-VOA	PNL-ALO-120/345		
Hexachloro benzene	8250/8270		Semi-VOA	PNL-ALO-120/345		
Hexachloro butadiene	8250/8270		Semi-VOA	PNL-ALO-120/345		
Hexachloro ethane	8250/8270		Semi-VOA	PNL-ALO-120/345		
Nitrobenzene	8250/8270		Semi-VOA	PNL-ALO-120/345		
Pentachloro phenol	8250/8270		Semi-VOA	PNL-ALO-120/345		
2,4,5-Tri chlorophenol	8250/8270		Semi-VOA	PNL-ALO-120/345		
2,4,6-Tri chlorophenol	8250/8270		Semi-VOA	PNL-ALO-120/345		
OTHER VOAs & SEMI-VOAs (OR SPENT SOLVENT LIST)						
Carbon Disulfide			VOA	PNL-ALO-335		
p-Dichloro benzene			Semi-VOA	PNL-ALO-120/345		
2-Ethoxyethanol			VOA(as TIC) HS	PNL-ALO-335		
Ethyl Benzene			VOA	PNL-ALO-335		
Ethyl Ether			VOA(as TIC)	PNL-ALO-335		
Ethyl Acetate			VOA(as TIC)	PNL-ALO-335		
Isobutanol			VOA,HS	PNL-ALO-335		
Methanol			HS	Test Plan		
Methyl Isobutyl Ketone			VOA	PNL-ALO-335		
Methylene Chloride			VOA	PNL-ALO-335		
2-Nitropropane			VOA(as TIC)	PNL-ALO-335		
Toluene			VOA	PNL-ALO-335		
1,1,2-Trichloro - 1,2,2-Tri fluoroethane			VOA(as TIC)	PNL-ALO-335		
Trichloro monofluoro methane			VOA(as TIC)	PNL-ALO-335		

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	Procedure	Vol of Sample	Action Level
o,m,p-Xylene (mixed)			VOA	PNL-ALD-335		
METALS						
Antimony (Sb)	6010A		ICP	LA-505-151 LA-505-161		
Arsenic (As)	7060/7061		AA/Hydride	LA-355-131		
Barium	6010A	50 ug/ml	ICP	LA-505-151 LA-505-161	10.0 ml	100 ug/ml
Beryllium (Be)	6010A		ICP	LA-505-151 LA-505-161		
Cadmium (Cd)	6010A	0.1 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	1 ug/ml
Chromium (Cr)	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
Cobalt (Co)	6010A		ICP	LA-505-151 LA-505-161		
Copper (Cu)	6010A		ICP	LA-505-151 LA-505-161		
Lead (Pb)	6010A	0.5 ug/ml	ICP	LA-505-151 LA-505-161	SEE h	5 ug/ml
Manganese (Mn)	6010A		ICP	LA-505-151 LA-505-161		
Mercury (Hg)	7471		Cold vapor AA	LA-325-104		
Molybdenum (Mo)	6010A		ICP	LA-505-151 LA-505-161		
Nickel (Ni)	6010A		ICP	LA-505-151 LA-505-161		
Potassium (K)	6010A		ICP	LA-505-151 LA-505-161		
Selenium (Se)	7740/7741		AA/Hydride	LA-365-131		
Silver (Ag)	6010A		ICP	LA-505-151 LA-505-162		
Sodium (Na)	6010A		ICP	LA-505-151 LA-505-161		
Thallium (Tl)	6010A		ICP	LA-505-151 LA-505-161		
Uranium (U) (total)	none	0.1 ug/ml	Laser Kinetic Phosphores-cence	LA-925-009	0.5 ml	Np

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	Procedure	Vol of Sample	Action Level
Vanadium (V)	6010A		ICP	LA-505-151 LA-505-161		
Zinc (Zn)	6010A		ICP	LA-505-151 LA-505-161		
ANIONS						
Chlorine	9056		IC	LA-533-105		
Fluorine	9056		IC	LA-533-105		
Nitrate	9056		IC	LA-533-105		
Nitrite	9056		IC	LA-533-105		
Phosphate	9056		IC	LA-533-105		
Sulfate	9056		IC	LA-533-105		
OTHER						
Flash Point			Flashpoint apparatus	PNL-ALO-234		
Energetics	none	0 J/g	DSC (in air)	LA-514-113 LA-514-114	0.1 ml	> 0
Ash %	none	.01 %		ASTM482-80	5.0 ml	.1 %
NPH	3580A	1%	SVOA(as TIC)	PNL-ALO-120/345	7 ml	Np
D2EHPA	3580A	1%	IR,GC	Test Plan	7 ml	Np
TBP	3580A	1%	SVOA(as TIC)	PNL-ALO-120/345	7 ml	Np
Moisture % (Water %)	none	1%	TGA	LA-514-114	0.1 ml	Np
Water Solub.	none	--	Miscibility Test	ASTMD5058-90/C	5.0 ml	Np
Specific Gravity	none	--	Mass/Volume	LA-510-112	0.5 ml	Np
TOX			TOX	PNL-ALO-321		
TOC			Persulfate coulometry	LA-342-100		
Particle Size	none	--	Particle Size Analyzer	LT-519-101	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	Procedure	Vol of Sample	Action Level
pH/corrosive test			1:1 ratio extraction or NACE standard TM-01-69, method 1110	LA-212-106		
Cyanide/ Sulfide Reactivity	7.33/7.34		Ext. spectrophoto metry	PNL-ALO-287/289		
RADIONUCLIDES						
^{241}Am	none	0.001 uCi/ml	AEA	LA-953-103	10 ml	Np
^{242}Am			AEA	PNL-ALO-417/422		
^{242m}Am			AEA	PNL-ALO-417/422		
^{137m}Ba			GEA	PNL-ALO-450		
^{14}C			Oxidizer + scintillation	PNL-ALO-428/474		
^{113m}Cd			Sep. Beta count	Test plan		
^{144}Ce			GEA	LA-548-121		
^{36}Cl			Sep. Beta count	PNL-ALO-407		
^{60}Co			GEA	LA-548-121		
^{134}Cs			GEA	LA-548-121		
^{137}Cs	none	0.001 uCi/ml	GEA	LA-548-121	22.0 ml	0.025 uCi/ml
^{152}Eu			GEA	LA-548-121		
^{154}Eu			GEA	LA-548-121		
^{155}Eu			GEA	LA-548-121		
^{3}H			Oxidizer Scintillation	PNL-ALO-428/474		
^{129}I			Separation GEA	LA-378-103		
^{99}Tc			Liquid Scintillation	LA-439-101		
^{85}Kr			GEA	PNL-ALO-450		
^{237}Np	none	0.0001 uCi/ml	TTA Extraction	LA-933-141	3 ml	Np

Table 2: ORGANIC PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	SW-846 Reference Method	Minimum Quantitation Levels [a]	Method Type	Procedure	Vol of Sample	Action Level
^{234m}Pa			GEA	LA-549-121		
^{147}Pm			ICP/MS	Test Plan		
^{144}Pr			GEA	LA-549-121		
^{144m}Pr			GEA	PNL-ALO-450		
^{238}Pu			IX AEA	LA-943-128		
^{239}Pu	none	0.005 uCi/ml	IX AEA	LA-943-128	10.0 ml	Np
^{240}Pu	none	0.005 uCi/ml	IX AEA	LA-943-128	10.0 ml	Np
^{241}Pu			Sep. Scintillation	PNL-ALO-417/422/474		
^{187}Re			ICP/MS	PNL-ALO-280		
^{106}Ru			GEA	PNL-ALO-450		
^{125}Sb			GEA	PNL-ALO-450		
^{79}Se			Liquid Scintillation	LA-355-132		
^{151}Sm			ICP/MS	Test Plan		
^{90}Sr	none	0.01 uCi/ml	Separation Beta count	LA-220-101	5.0 ml	0.5 uCi/ml
^{125m}Te			GEA	PNL-ALO-450		
^{234}Th			GEA	LA-549-121		
^{234}U			ICP/MS	PNL-ALO-280		
^{237}U			ICP/MS	PNL-ALO-280		
^{238}U			ICP/MS	PNL-ALO-280		
^{90}Y			Sep. beta count	PNL-ALO-476/431/450		
^{93}Zr			Sep. beta count	PNL-ALO-474		
Total Beta		0.01uCi/ml	Proportional Counter			1.1uCi/ml

[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 ANALYSES 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, analyze 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 analyses was based on requirements of the Double Shell Tank (DST) Waste Analysis Plan (WAP), WHC-SD-WM-EV-053, Rev 4. Meetings were held with representatives from Tank Farms to gain concurrence on the list of analyses.

Table 1: AQUEOUS PHASE
QUALITY ASSURANCE OBJECTIVES FOR WASTE CHARACTERIZATION

Parameter	Minimum Quantitation Levels a	Method Type	2225 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-695-102	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 <5.5 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-943-127	>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-509-101	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 analyses 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	0.025
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 239/240	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.