DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	G. A. Ritter	Date 5/22/95
Project Title/Work Order		EDT No. 611684
Half-Liter Supernatant Sampler System Engineering Work Plan		ECN No. NA

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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ENGINEERING DATA TRANSMITTAL

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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1.	WHC-SD-WM-WP-303	All	0	Half-Liter Supernatant Sampler System Engineering Work Plan	SQ	1		

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
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17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

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1	1	~~Cog~~ Proj. Eng. GA Ritter	[signature]	5/18/95	H0-38	R Akita	[signature] for R Akita	5/18/95	T6-20	1	1
1	1	Cog. Mgr. ~~CE Hanson~~ JS Schofield	[signature]	6/5/95	~~H5-09~~ S7-12	J Greenborg	[signature]	5/22/95	H0-35	1	1
1	1	QA ML McElroy	[signature]	5/18/95	~~B1-57~~ S7-07	RL Guthrie	[signature]	5/22/95	H4-65	1	1
1	1	Safety LS Krogsrud	[signature]	5/22/95	R3-08	KP Mortensen	[signature]	5-18-95	S7-05	1	1
1	1	Other BA Crea	[signature]	5/18/95	H0-33	MD Clements	[signature]	5/18/95	G2-02	1	1
1	1	EJ Berglin	[signature]	5/18/95	G3-20	JR Thielges	[signature]	5/22/95	L6-38	1	1
3		WJ Kennedy			S7-01	Cog. Engr. R.K. Brown	[signature]	6/5/95	S7-12	1	1

18.	19.	20.	21. DOE APPROVAL (if required)
G. A. Ritter [signature] 5/18/95 Signature of EDT Originator / Date	C. E. Hanson [signature] 6/5/95 Authorized Representative for Receiving Organization / Date	C. E. Hanson [signature] 6/5/95 Cognizant/Project Engineer's Manager / Date	Ltr. No. [] Approved [] Approved w/comments [] Disapproved w/comments

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RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-WP-303, Rev. 0
Document Title:	HALF-LITER SUPERNATANT SAMPLER SYSTEM ENGINEERING WORK PLAN
Release Date:	6/6/95

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Chris Willingham

C. Willingham 6/6/95

SUPPORTING DOCUMENT

1. Total Pages 25

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5. Key Words

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waste tanks

6. Author

Name: G. A. Ritter

G. A. Ritter

Signature

Organization/Charge Code 8M720/N4111

7. Abstract

This work plan defines the tasks associated with the development of a half-liter supernatant sampler system. Specifically, this work plan will define the scope of work, identify organizational responsibilities, identify major technical requirements, describe configuration control and verification requirements, and provide estimated costs and schedule. The sampler system will be fully operational including trained staff and operating procedures upon completion of this task.

8. RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE JUN 06 1995
35 Station 21

CONTENTS

LIST OF TERMS

ABU	acceptance for beneficial use
ALARA	as low as reasonably achievable
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATP	acceptance test procedure
ATR	acceptance test report
ECN	engineering change notice
EDT	engineering data transmittal
ESQ	environmental, safety, and quality
HLSSS	Half-Liter Supernatant Sampler System
ICF-KH	ICF-Kaiser Hanford Company
IPM	initial pretreatment module
OMM	operation and maintenance manual
ORR	operational readiness review
OTC	onsite transfer cask
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RWP	radiation work permit
SAR	safety analysis report
SARP	safety analysis report for packaging
SDD	system design description
TWRS	Tank Waste Remediation System
USQ	unreviewed safety question
WHC	Westinghouse Hanford Company

LIST OF FIGURES

HALF-LITER SUPERNATANT SAMPLER SYSTEM ENGINEERING WORK PLAN

1.0 INTRODUCTION

The Tank Waste Remediation System (TWRS) pretreatment facility project W-236B, known as the Initial Pretreatment Module (IPM), requires samples of supernatants and sludges from 200 Area tank farms for planned hot testing work in support of IPM design. Sample size capabilities required to support the current IPM testing scope range from 10 mL up to 4,000 L (WHC 1995). Several other Hanford Site programs also have a need for waste tank supernatant samples including Characterization, Safety, Retrieval, and Operations for evaporator feed, tank farm transfers, and Resource, Conservation, and Recovery Act (RCRA) compliance. Current Hanford Site sampling capabilities are limited to 300 mL samples of supernate, sludge, or salt cake using a core-drilling system, and 100 mL supernate and soft sludge samples using a "bottle-on-a-string" technique. There is no waste sampling capability or handling infrastructure to support the larger bench-scale testing needs of the IPM project.

The IPM project has proposed the development of several new sampler systems. These systems include a 0.5-L supernatant sampler, 3-L and 25-L supernatant and sludge samplers, and a 4000-L sampler system. The 0.5-L sampler will support IPM sampling needs in the 1 to 3 L range starting in late fiscal year 1995. This sampler is intended to be used in conjunction with the existing 100 mL bottle-on-a-string. The 3-L and 25-L systems will be based on the Savannah River Site's sampler system and will support IPM sampling needs in the 3 to 100 L range. Most of the hot testing required for design of the IPM must be accomplished in the next 3 years.

This work plan defines the tasks associated with the development of a 0.5-L sampler system. This system will be referred to as the Half-Liter Supernatant Sampler System (HLSSS). Specifically, this work plan will define the scope of work, identify organizational responsibilities, identify major technical requirements, describe configuration control and verification requirements, and provide estimated costs and schedule. The sampler system will be fully operational, including trained staff and operating procedures, upon completion of this task.

2.0 SCOPE

2.1 OBJECTIVES

The primary objectives of this development activity are as follows:

- Provide all necessary engineering and staff to support the planning, design, fabrication, testing, and implementation of the HLSSS

- Maximize use of existing designs, equipment, and procedures to reduce development time and cost

- Design the HLSSS to minimize exposure and contamination to operations personnel and the environment

- Coordinate with all users and user support groups, including IPM engineering and the 222-S Laboratory, to obtain concurrence on the design

- Obtain all necessary permits required for operation of the sampler system on the Hanford Site

- Provide training procedures and support training of operations staff

- Provide a sampler system with a sufficient number of samplers and casks to obtain an accumulative sample of up to 3 L of supernatant from a double-shell or single-shell tank. This sample will be transferred to the 222-S Laboratory for recovery, repackaging, and shipment to the users.

2.2 DELIVERABLES

The following deliverables will be provided:

- This work plan, including the functions and requirements section, to document the approved functional requirements of the HLSSS

- System design description (SDD), in accordance with *Standard Engineering Practices*, WHC-CM-6-1, to provide a complete description of the HLSSS design

- Structural analysis report to assure that tank damage does not occur from operation of the HLSSS

- Material compatibility study to verify that the HLSSS materials are compatible with the tank waste

- Safety assessment/unreviewed safety questions (USQ) screening and environmental permits documenting that the HLSSS conforms to Westinghouse Hanford Company (WHC) safety standards and other applicable regulations

- Updated safety analysis report for packaging (SARP) to approve transportation of the sampler with the existing on site transfer cask (OTC)

- As-built engineering drawings and data package for HLSSS safety class components that includes weld records, material certifications, quality control (QC) inspections, etc.

- Acceptance test procedure (ATP), and acceptance test report (ATR), in accordance with WHC-CM-6-1, to document the procedures and results of qualification testing of the HLSSS

- Operation and maintenance manual (OMM) for the HLSSS and unloading procedures for the 222-S Laboratory

- Training plan and procedures
- Radiation work permit (RWP), ALARA (as low as reasonably achievable) management worksheets, and shielding analysis report (with dose rate projections)
- Field installation work plans, packages, and procedures
- Acceptance for beneficial use (ABU) forms accepted by Operations Engineering prior to turning equipment over to operations.

Upon completion of the above deliverables, the final deliverable will be

- One fully assembled and tested HLSSS ready for field operation to deliver 0.5 to 3 liters of supernatant samples to the 222-S hot cells. A total of 6 casks and 15 disposable samplers will be provided.

3.0 DESCRIPTION

3.1 PHYSICAL DESCRIPTION

The current conceptual design for the HLSSS is a system consisting of three major components: sampler, controller, and transfer mechanism. The HLSSS will mate with a waste tank riser that is 4 inches or larger. The sampler will then be lowered and immersed in supernatant waste, filled in a controlled manner, and withdrawn by the controller into a shielded receiver. The transfer mechanism will be used to transfer the sampler from the controller into the OTC. The OTC will have a liner that is compatible with the sampler. The existing OTC truck will transport the cask with sample to the 222-S Laboratory, which is the designated receiving laboratory. Existing tooling and fixturing at the laboratory will handle the sampler including transfer of the contents into designated receivers, and disposal of the samplers. New tooling may need to be designed and fabricated if existing tooling is not compatible. From the 222-S Laboratory, the samples can be repackaged and shipped to various facilities for hot testing.

3.1.1 System Components

A conceptual sketch of the HLSSS is given in Figure 1. In this concept, the transfer mechanism is a simple A-Frame with trolley and power hoist for maneuvering the controller between the waste tank's riser and the OTC. Figure 2 shows the existing OTC truck and transport arrangement to be used with the HLSSS.

The HLSSS will consist of the following components:

- Sampler to acquire supernatant sample from Hanford Site 200 Areas waste tanks
- Controller mechanism to interface sampler with a waste tank's riser (4-in. minimum) and control deployment of the sampler

- Transfer mechanism to transfer the sample from the controller to the OTC.

3.1.2 Functions and Requirements

The HLSSS must satisfy the functions and requirements listed in the following sections. It should be noted that the HLSSS will not be designed for the following:

- Sampling sludge
- Penetrating thick crust or wastebergs
- Using with the existing core drilling truck
- Determining the sludge/supernatant interface (assumed to be known)
- Sampling supernatant waste with depth less than sampler height plus margin (approximately 1 - 2 ft).

3.1.2.1 Performance Requirements

- The HLSSS will obtain one nominal 0.5-L supernatant sample per evolution (0.45 L < sample volume < 0.5 L) using a disposable sampler.
- Maximum set-up and take-down time with a crew of three to four personnel in a non radioactive environment shall be 1 day.
- Minimum sample rate shall be one sample per 2 hours in a non radioactive environment.
- Sampler shall not alter either the physical or the chemical properties of the sampled material.
- Sampler must prevent dilution of sample as it is withdrawn.
- Sampler must have high reliability, recovering at least 90% of the sample volume 90% of the time.
- System shall be simple in design and cost-effective in operation.
- System shall be reusable, mobile, and maintainable (sampler may be disposable if cost-effective).
- All sampling hardware must be retrievable from the tank after completion of sampling activities.

3.1.2.2 Mechanical and Material Requirements

- Sampler must withstand a hydrostatic head of up to 3 atm.
- The HLSSS must be capable of obtaining a sample from any depth in the supernatant waste (with restriction given above).

- Controller shall continuously provide relative sampler position to within ± 6 in.
- Controller shall provide a means to control air inleakage to the tank when connected to the tank.
- Sampler shall not be capable of releasing pressure into the OTC liner that would pressurize the liner to greater than 38 psia
- Maximum weight of the sampler (full of waste) shall be 20 lbs (WHC 1992).
- Sampler shall consist of materials that are compatible with the tank environment, shipping casks, and laboratory hot cells.
- Sampler shall be designed to contain waste material with activity levels as specified in *Tank Waste Compositions and Atmospheric Dispersion Coefficients for use in ASA Consequence Assessments*, WHC-SD-WM-SARR-016.
- Sampler must obtain waste samples with temperatures up to 90 °C, and an OH concentration of up to 4 M.
- Sampler must withstand radiation doses of 2,000 R/h with no loss of integrity.

3.1.2.3 Safety

- Radiation dose to workers shall be minimized in accordance with ALARA principles and in compliance with the *Hanford Site Radiological Controls Manual*, HSRCM-1.
- Controller shall provide a means of removing most of the surface contamination from the sampler before it is placed in the OTC for transport to the laboratory.
- System operation shall be in compliance with riser and tank load limits.
- Transfer mechanism will be designed to maintain adequate shielding based on a worst case scenario as the sample is lowered from the controller into the OTC.
- System shall minimize the spread or release of radioactive or hazardous materials into the environment.
- System must operate safely in an environment potentially containing explosive gases (for samplers to be inserted into flammable gas watch list tanks).

3.1.2.4 Interfaces

- Sampler and controller must interface with waste tank 4-in. or larger risers.

- The HLSSS may use existing double-shell tank farm air (100 psi, 10 scfm minimum), water (60 psi, 5 gpm minimum), and electrical (115 V, 60 Hz, 20 A) utilities.

- Sampler and liner must fit within the existing OTC, which consists of a 2.375 in. diameter by 42.75 in. long cavity.

- The HLSSS must interface with the existing transport truck for shipping the OTC between the 200 Areas waste tank farms and the 222-S Laboratory.

- The HLSSS must interface with decontamination and packaging equipment for reuse or disposal.

3.1.3 Codes and Standards

The activities outlined in this work plan shall be performed in accordance with the WHC manuals and procedures listed in the following table as applicable.

MANUALS/PROCEDURES	WHC DOCUMENT
306E Facility Equipment Operating Procedures	WHC-IP-0550
306E Facility Operating Procedures	WHC-IP-0793
306E Facility Administration Manual	WHC-IP-0882
Quality Assurance Manual	WHC-CM-4-2
Nondestructive Test Procedures	WHC-CM-4-38
Standard Engineering Practices	WHC-CM-6-1
Procurement Manual and Procedures	WHC-CM-2-1
Hazardous Material Packaging & Shipping	WHC-CM-2-14
Work Management Manual	WHC-CM-1-8
Environmental Compliance	WHC-CM-7-5
Management Requirements and Procedures	WHC-CM-1-3
Hanford Site Radiological Controls Manual	HSRCM-1
ALARA Program Manual	WHC-CM-4-11
Industrial Safety Manual	WHC-CM-4-3
Industrial Hygiene Manual	WHC-CM-4-40
Standard Operating Practices	WHC-CM-1-5

The HLSSS will be designed using the English system of units. The sampler system cannot be designed to the Hanford Metric Implementation Plan because the system must interface with casks, tank risers, and other hardware that were designed to the English system.

3.2 ENGINEERING TASKS

Westinghouse Hanford Company Characterization Projects is responsible for the overall coordination of the project including all tasks outlined in this work plan. The engineering tasks along with supporting work required by other organizations are described in detail in section 4.0.

3.3 VERIFICATION

Design verification of the HLSSS shall be performed in accordance with WHC-CM-6-1, EP-4.1. Design in progress reviews (30%), where required, will be informal reviews. Final design reviews (90%) will be independent technical reviews in accordance with the direction of the cognizant engineer and manager. Qualification testing of prototype HLSSS components in a non-radioactive environment will also be performed to verify compliance with the design criteria specified in Section 3.1.2 of this work plan.

3.4 PROCUREMENT TASKS

All materials and components shall be procured in accordance with the *Procurement Manual and Procedures*, WHC-CM-2-1. Material certifications, in accordance with the applicable material standards of the American Society for Testing and Materials (ASTM) and of the American Society of Mechanical Engineers (ASME), shall be required for Safety Class 3 purchased raw material and weld filler metal. Material certifications shall be traceable to the material heat or lot number. Traceability to the material certifications shall be maintained during fabrication as noted by the associated drawing, sketch, or specification.

Quality assurance (QA) inspection will be performed on Safety Class 3 raw material procurements to assure identification and traceability in accordance with the *Quality Assurance Manual*, WHC-CM-4-2.

Advanced procurements are encouraged. It is accepted that some equipment procured may not be used in the final assembly because of the developmental nature of the task.

3.5 FABRICATION TASKS

Fabrication of components shall meet the requirements specified on the drawings and in this work plan. Design and fabrication of the HLSSS shall be in accordance with *Standard Engineering Practices*, WHC-CM-6-1, EP-2.4, "Development Control." The requirements to be followed are those for hardware with facility-use potential.

Drawings, sketches, and specifications shall be identified as "Development Control" in accordance with WHC-CM-6-1, EP-2.4. Two complete, independent sets of these fabrication drawings shall be maintained with identical information and updated on a daily basis (if drawing changes are required). One set is to be in the cognizant engineer's possession, and one set is to be with the fabrication package. Changes, additions, or deletions to development control drawings, sketches, or specifications shall be controlled either by marking the change in red ink or by preparing additional pages or sketches and identifying traceability to the affected drawing, sketch, or specification. A logbook of drawing changes and their locations is to be maintained with the drawings. For all drawing modifications, the affected area shall be clouded in red, signed, and dated by the cognizant engineer or his designee.

At the end of fabrication, all development control changes shall be incorporated into the appropriate engineering documents. Engineering drawings shall be prepared and released as H-series drawings in accordance with WHC-CM-6-1, EP-1.3. Engineering specifications shall be prepared and released in accordance with WHC-CM-6-1, EP-1.2. All subsequent changes to released drawings shall be controlled using the engineering change notice (ECN) process in accordance with WHC-CM-6-1, EP-2.2.

3.6 PRE-OPERATIONAL AND OPERATIONAL TESTS

A preoperational test in the form of a qualification test in a non-radioactive environment will be performed as specified in Section 3.3 above. Testing will be in accordance with an approved qualification test plan. Testing in 306E shall be conducted by the cognizant test engineer/test director and performed in accordance with WHC-IP-0882, "306E Facility Administration Manual." An ABU form will be completed prior to installation or operation in a tank farm.

3.7 INSTALLATION TASKS

Plant Engineering is responsible for preparing and documenting, in accordance with tank farm procedures, the field installation work plan. The installation work plan and work package will be tracked through the Job Control System.

4.0 ORGANIZATION

The task descriptions and responsibilities are outlined in the following sections. Signatures on the engineering data transmittal (EDT) form for this document indicate agreement for the task responsibility, schedule, and estimated costs by the responsible organization.

4.1 CHARACTERIZATION NEW EQUIPMENT

Manager: J. W. Lentsch
Engineering Manager: C. E. Hanson
Lead Project Engineer: G. A. Ritter (matrixed from Nuclear Analysis and Characterization)
Organization code: 8M720/75400

- Provide overall planning, scheduling, budgeting, and coordination of the project.
- Prepare this work plan including the design criteria specified in Section 3.1.2.
- Prepare the SDD in accordance with WHC-CM-6-1 and support design of the HLSSS.
- Coordinate and support the fabrication of all components of the HLSSS.
- Prepare and approve procurement documents as cognizant engineer and manager.
- Prepare the ATP and ATR in accordance with WHC-CM-6-1 and coordinate qualification testing of the HLSSS.
- Prepare the OMM for the HLSSS.
- Prepare training plan and procedures and support training to operators.
- Prepare ABU forms to be accepted by Operations Engineering prior to turning equipment over to operations.
- Determine safety class of all components of the HLSSS.
- Approve all engineering and safety documentation.
- Provide lead project engineer and manager responsibilities through design, procurement, fabrication, and acceptance testing, prior to turning equipment over to operations as shown in the matrix below. During field installation and through operation, the New Equipment group will provide support to the Plant Engineering organization.

	Design	Procurement	Fabrication	ATP	Field Installation	OTP	ABU	Operation
Char New Equip	L	L	L	L	S	S	S	S
Char Plant Engr	S	S	S	S	L	L	L	L

L: lead engineer/manager responsibilities
S: support engineer/manager responsibilities

4.2 CHARACTERIZATION PLANT ENGINEERING

Manager: J. S. Schofield
Engineer: TBD
Organization code: 75210

- Assume cognizant engineer and cognizant manager responsibilities after turning equipment over to operations as shown in the matrix above.
- Sign documentation as the cognizant engineer and cognizant manager. Procurement approvals are delegated to the design engineering organization.
- Review and approve functions and requirements, design, training, operation and maintenance, and safety documents as required.
- Determine requirements for ABU.
- Prepare field installation work plans and support the preparation, planning, scheduling, and performance of the Job Control System work packages in the tank farms.

4.3 IPM PROGRAM/TECHNICAL INTEGRATION

Manager: S. A. Barker
Engineer: E. J. Berglin
Organization code: 8K430

- Review and approve HLSSS design criteria specified in Section 3.1.2.
- Provide coordination between the various sampling programs, and establish tank farm sampling schedule to meet the needs of IPM hot testing work.

4.4 TWRS SAFETY ENGINEERING

Manager: E. J. Lipke
Engineer: B. A. Crea
Organization code: 74220

- Provide design support for the HLSSS.
- Support HLSSS prototype fabrication and testing activities.
- Assist in preparation of engineering documentation including the SDD, ATP, ATR, OMM, and training plans and procedures.

4.5 NUCLEAR PHYSICS AND SHIELDING

Manager: J. Greenborg
Engineer: R. A. Schwarz
Organization code: 8M730

- Prepare report to include results of dose rate calculations for determining shielding required for the HLSSS components and to support ALARA planning.

4.6 SPENT NUCLEAR FUEL EVALUATIONS

Manager: R. P. Omberg
Engineer: S. L. Hecht
Organization code: 8M710

- Prepare report to include results of stress analysis to assure there will be no tank damage from operation of the HLSSS.

- Design impact limiter for HLSSS as required by results of above calculations.

4.7 TWRS SAR ENGINEERING

Manager: R. L. Schlosser
Engineer: R. L. Guthrie
Organization code: 8M110

- Prepare safety analysis/USQ screening of the HLSSS as it relates to installation, operation, and removal from the tank farm waste tanks.

- Provide design support as related to safety issues and attend status meetings to participate in design decisions.

4.8 ENVIRONMENTAL SERVICES

Manager: W. T. Dixon
Primary Contact: R. J. Swan
Organization code: 01800

- Obtain environmental permits for operation of the HLSSS if not already covered under existing permits.

4.9 PACKAGING SAFETY ENGINEERING

Manager: J. G. Field
Engineer: M. D. Clements
Organization code: 84100

- Provide updated SARP to approve transportation of the sampler with the existing OTC.

4.10 CHARACTERIZATION PROJECT ESQ

Manager: J. C. Midgett
Engineer: M. L. McElroy
Organization code: 3E200

- Review and approve engineering documentation as required.
- Perform the necessary inspection activities to ensure conformance to the appropriate documents and procedures during fabrication.
- Perform design verification activities to ensure that the as-built engineering documentation reflects the final system configuration.
- Support operational readiness review (ORR) and field operation of equipment.

4.11 TWRS NUCLEAR SAFETY

Manager: M. N. Islam
Engineer: L. S. Krogsrud
Organization code: 31N30

- Review and approve engineering documentation as required.
- Review and approve safety class designations.
- Coordinate all required safety reviews (i.e., Industrial Health and Safety, Fire Safety, and Health Physics).
- Support ORR and field operation of equipment.

4.12 ICF KAISER HANFORD COMPANY SPECIAL PROJECTS DESIGN SERVICES

Manager: R. L. Romine
Lead Designer: TBD
Organization code: 5A611

- Provide mechanical design and checking support and prepare as-built H-series drawings for the HLSSS.

4.13 EQUIPMENT DEVELOPMENT - 306E

Manager: J. R. Thielges
Fabrication Engineer: T. A. Delucchi
Cognizant Technician: TBD
Organization code: 0M520

- Provide fabrication support for the HLSSS.
- Maintain a quality "traveler" package to allow final equipment QA inspection and green tagging (typical contents: assembly

instructions, weld records, material certifications, QC inspections).

- Compile an as-built data package and vendor files (owner's manuals, cut sheets, calibrational certifications, etc).
- Perform/support proof-of-principle and qualification testing of the HLSSS.
- Support equipment operation in the field during training and turn over to operations.

4.14 HOT CELL AND SAMPLE PREPARATION

Manager: R. Akita
Engineer: TBD
Organization code: 75910

- Support the design of hot cell tooling and fixtures for recovering the sample from the sampler as required.
- Provide procedures for receiving, unloading, manipulating, and disposal of samples at the 222-S laboratory.

4.15 CHARACTERIZATION PROJECT RAD CONTROL

Manager: K. D. Haggerty
Engineer: K. P. Mortensen
Organization code: 3E120

- Assist the job control system (JCS) planner in the preparation of ALARA management worksheets and RWP.
- Provide Health Physics review of HLSSS design and documentation as required.
- Review and approve field work plans and work packages as required.
- Support ORR and field operation of HLSSS.

4.16 CHARACTERIZATION OPERATIONS/FIELD SAMPLING

Manager: R. Ni
Field Manager: W. J. Kennedy
Organization code: 75150

- Provide operations review of HLSSS design and documentation as required.
- Review and approve field work plans and work packages as required.
- Support ORR and field operation of HLSSS.

- Supervise the installation, operation, removal, and storage of equipment in the tank farms.

5.0 SCHEDULE

The schedule for the development of the HLSSS is shown in Figure 3. A summary of the primary activities is given below.

Complete HLSSS detailed design and review	June 20, 1995
Complete HLSSS prototype fabrication	July 20, 1995
Complete HLSSS qualification testing	August 3, 1995
Complete operations training for HLSSS	August 28, 1995
Install and operate HLSSS in the field	September 15, 1995

6.0 COST ESTIMATE

The detailed cost estimate by organization for fiscal year 1995 is provided in Figure 4. The total estimated costs, including overhead, are $585,000.

7.0 QUALITY ASSURANCE

Quality assurance requirements for the activities in this work plan shall be in accordance with 10 CFR 830.120, and the WHC *Quality Assurance Manual*, WHC-CM-4-2. The approval designator shall be a minimum of SQ for all documents.

8.0 REFERENCES

10 CFR 830.120, "Quality Assurance Requirements," *Code of Federal Regulations*, as amended.

HSRCM-1, *Hanford Site Radiological Control Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC, 1992, *Onsite Transfer Cask Safety Analysis Report for Packaging*, WHC-SD-TP-SARP-002, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994, *Tank Waste Compositions and Atmospheric Dispersion Coefficients for use in ASA Consequence Assessments*, WHC-SD-WM-SARR-016, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995, *TWRS Tanks Waste Pretreatment Process Development Hot Test Siting Report*, WHC-SD-WM-TA-160, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-1-3, *Management Requirements and Procedures*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-1-5, *Standard Operating Practices*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-1-8, *Work Management Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-2-1, *Procurement Manual and Procedures*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-2-14, *Hazardous Material Packaging and Shipping*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-2, *Quality Assurance Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-3, *Industrial Safety Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-11, *ALARA Program Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-38, *Nondestructive Test Procedures*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-40, *Industrial Hygiene Manual*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-6-1, *Standard Engineering Practices*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-7-5, *Environmental Compliance*, Westinghouse Hanford Company, Richland, Washington.

WHC-IP-0550, *306E Facility Equipment Operating Procedures*, Westinghouse Hanford Company, Richland, Washington.

WHC-IP-0793, *306E Facility Operating Procedures*, Westinghouse Hanford Company, Richland, Washington.

WHC-IP-0550, *306E Facility Administration Manual*, Westinghouse Hanford Company, Richland, Washington.

Figure 1. Waste Tank and Sampler System Schematic.

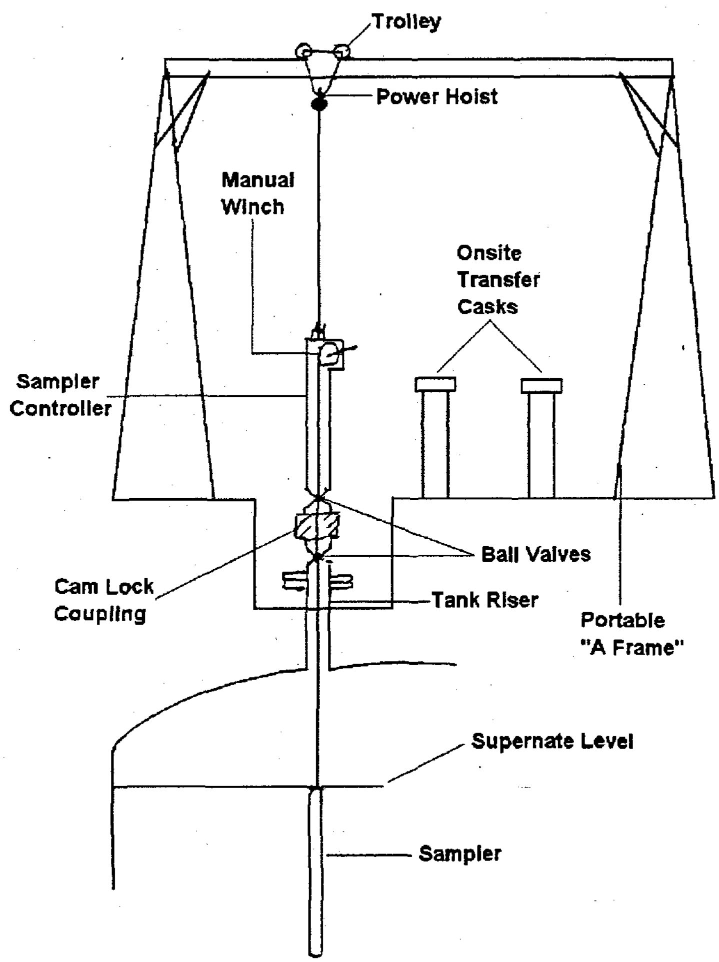
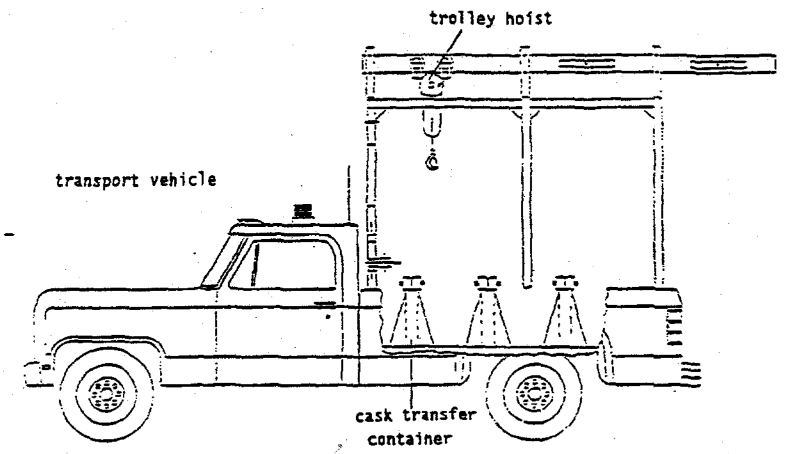
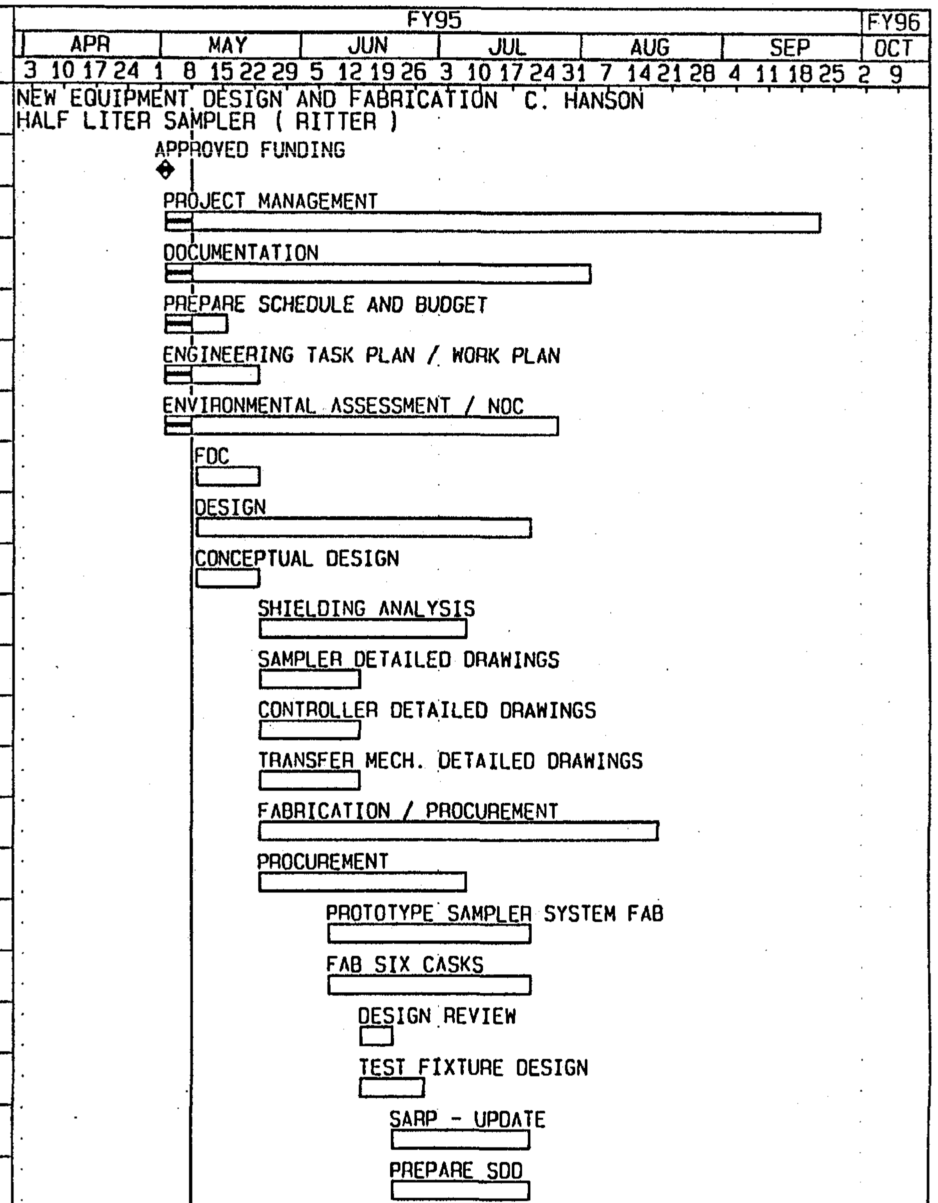


Figure 2. Onsite Transfer Cask Truck and Tiedown Arrangement.



NEW EQUIPMENT DESIGN AND FABRICATION C. HANSON
HALF LITER SAMPLER (RITTER)

ACTIVITY ID	EARLY START	EARLY FINISH	ORIG DUR	REM DUR	ACTIVITY
1N4J200001	2MAY95A		0	0	APPROVED FUNDING
1N4J200002	2MAY95A	21SEP95	100	95	PROJECT MANAGEMENT
1N4J200003	2MAY95A	2AUG95	65	60	DOCUMENTATION
1N4J200004	2MAY95A	15MAY95	10	6	PREPARE SCHEDULE AND BUDGET
1N4J200005	2MAY95A	22MAY95	15	11	ENGINEERING TASK PLAN / WORK PLAN
1N4J200009	2MAY95A	26JUL95	60	55	ENVIRONMENTAL ASSESSMENT / NOC
1N4J200006	9MAY95	22MAY95	10	10	FDC
1N4J200011	9MAY95	20JUL95	50	50	DESIGN
1N4J200013	9MAY95	22MAY95	10	10	CONCEPTUAL DESIGN
1N4J200012	23MAY95	6JUL95	30	30	SHIELDING ANALYSIS
1N4J200014	23MAY95	13JUN95	15	15	SAMPLER DETAILED DRAWINGS
1N4J200016	23MAY95	13JUN95	15	15	CONTROLLER DETAILED DRAWINGS
1N4J200018	23MAY95	13JUN95	15	15	TRANSFER MECH. DETAILED DRAWINGS
1N4J200021	23MAY95	17AUG95	60	60	FABRICATION / PROCUREMENT
1N4J200024	23MAY95	6JUL95	30	30	PROCUREMENT
1N4J200023	7JUN95	20JUL95	30	30	PROTOTYPE SAMPLER SYSTEM FAB
1N4J200026	7JUN95	20JUL95	30	30	FAB SIX CASKS
1N4J200015	14JUN95	20JUN95	5	5	DESIGN REVIEW
1N4J200019	14JUN95	27JUN95	10	10	TEST FIXTURE DESIGN
1N4J200008	21JUN95	20JUL95	20	20	SARP - UPDATE
1N4J200017	21JUN95	20JUL95	20	20	PREPARE SDD



Sheet 1 of 3

Figure 3. Schedule for Half-Liter Supernatant Sampler System Development.

FY95 / FY96 — APR, MAY, JUN, JUL, AUG, SEP, OCT

NEW EQUIPMENT DESIGN AND FABRICATION C. HANSON
HALF LITER SAMPLER (RITTER)

ACTIVITY ID	EARLY START	EARLY FINISH	ORIG DUR	REM DUR	ACTIVITY
1N4J200022	21JUN95	20JUL95	20	20	STRESS ANALYSIS
1N4J200037	21JUN95	28AUG95	47	47	OPERATIONS TRAINING
1N4J200039	21JUN95	20JUL95	20	20	PREPARE O&M MANUAL
1N4J200040	21JUN95	20JUL95	20	20	222-S UNLOADING PROCEDURES
1N4J200020	28JUN95	13JUL95	10	10	TEST FIXTURES FAB
1N4J200030	28JUN95	21AUG95	37	37	TESTING
1N4J200033	28JUN95	20JUL95	15	15	PREPARE ATP
1N4J200007	7JUL95	3AUG95	20	20	SAFETY ASSESSMENT / USQ SCREENING
1N4J200010	21JUL95	10AUG95	15	15	AS-BUILTS
1N4J200029	21JUL95	17AUG95	20	20	FIFTEEN ADDITIONAL SAMPLERS
1N4J200034	21JUL95	3AUG95	10	10	PERFORM ATP
1N4J200041	21JUL95	17AUG95	20	20	PREPARE TRAINING PLAN AND PROCEDURES
1N4J200043	21JUL95	22SEP95	45	45	DEPLOY TO FIELD
1N4J200044	21JUL95	10AUG95	15	15	PREPARE FIELD WORK PLAN
1N4J200035	4AUG95	17AUG95	10	10	PREPARE ATR
1N4J200025	11AUG95	17AUG95	5	5	RELEASE DRAWINGS
1N4J200027	11AUG95	31AUG95	15	15	PREPARE FIELD WORK PACKAGE
1N4J200045	11AUG95	31AUG95	15	15	ALARA MANAGEMENT WORK SHEET / RWP
1N4J200036	18AUG95	21AUG95	2	2	GREEN TAG SYSTEM
1N4J200042	22AUG95	28AUG95	5	5	PERFORM OPERATOR TRAINING
1N4J200028	1SEP95	8SEP95	5	5	SCHEDULE FIELD WORK

Sheet 2 of 3

ACTIVITY ID	EARLY START	EARLY FINISH	ORIG DUR	REM DUR
1N4J200031	11SEP95	15SEP95	5	5
1N4J200048	18SEP95	22SEP95	5	5

FY95 | FY96

APR | MAY | JUN | JUL | AUG | SEP | OCT

3 10 17 24 1 8 15 22 29 5 12 19 26 3 10 17 24 31 7 14 21 28 4 11 18 25 2 9

NEW EQUIPMENT DESIGN AND FABRICATION C. HANSON

HALF LITER SAMPLER (RITTER)

INSTALL AND OPERATE HLSS

ABU

Plot Date 22MAY95
Data Date 8MAY95
Project Start 1OCT92
Project Finish 29APR97

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

Sheet 3 of 3

WHC
DEPLOYMENT OF NEW EQUIPMENT
HALF LITER SAMPLER

ICF KAISER HANFORD

Date	Revision	Checked	Approved

Figure 4. Budget for the Half-Liter Supernatant Sampler System.

Half-Liter Supernatant Sampler System: *Resource Loading by ManHours per Month*											
					FY 1995						
Task Description	Resource	Org. Code	Mat Proc		Apr	May	Jun	Jul	Aug	Sep	
Project Management	Nuc Anal & Characterization	8M720			80	160	160	160	160	160	
Documentation											
SA/USQ Screening	TWRS SAR Engineering	8M110						80			
SARP	Packaging Safety Engineering	84100					80	80			
EA/NOC	Environmental Services	O1800				40	40	40			
Independent Safety	TWRS Nuclear Safety	31N30					20	40	28		
QA	Characterization Project ESQ	3E200					20	16	20		
Release Station	Configuration Documentation	66620					8	8	8		
Design											
Design/Drafting	TWRS SP Design Services	5A611				160	160	240	160		
Design support	TWRS Safety Engineering	71410				160	160	160			
Shielding Analysis	Nuclear Physics & Shielding	8M730				40	160	40			
Stress Analysis	Spent Nuclear Fuel Evaluations	8M710					80	80			
Fabrication/Procurement											
Prototype Fabrication	Equipment Development (306E)	0M520	$150,000				160	240			
Cask, Sampler Fab	Fabrication Services	52100	$120,000								
Testing											
Proof of Principal, ATP	Equipment Development (306E)	0M520						40	40		
Operations Training											
Operations	Characterization Operations	75150							100	100	
Training procedures	Tech Support Training	7CM30						80	80		
222-S Unloading procedures	Hot Cell & Sample Preparation	75910						80			
Deploy to Field											
Release Station	Configuration Documentation	66620						8			
Independent Safety	TWRS Nuclear Safety	31N30						40			
QA	Characterization Project ESQ	3E200						24			
ALARA MW/RWP	Characterization Rad Control	3E120							80		
Work Plan	Characterization Plant Engr	75210						40			
Work Package	200W Planner/Scheduler	72200							40		
Field Support	Industrial Health & Safety	31N10								24	
Field Support	Health Physics	33322								24	
	Total Materials/Procurement		$270,000								
					80	560	1048	1496	716	308	
Grand Total Manhours							Sum: FY '95:			4208	
Grand Total $$											$585,600