

Sta 4 (S)

AUG 05 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 1  
1. EDT No. 614232

2. To: (Receiving Organization) DISTRIBUTION		3. From: (Originating Organization) SPECIAL ANALYTICAL SUPPORT 8C530		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: VAPOR/AS/SPECIAL/ANALYTICAL/ SUPPORT		6. Design Authority/ Design Agent/Cog. Engr.: RICKY MAHON 3-7437		7. Purchase Order No.: N/A	
8. Originator Remarks: SST-241-BX-105. SAMPLING USING THE VAPOR SAMPLING SYSTEM				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: 622G	
11. Receiver Remarks:    11A. Design Baseline Document? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date:	

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	HNF-SD-WM-RPT-235		0	VAPOR AND GAS SAMPLING OF SST-241-BX-105	Q	2		

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	1. Approved		4. Reviewed w/comment	
		2. Release	5. Post-Review	2. Approved w/comment		5. Reviewed w/comment	
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment		6. Receipt acknowledged	

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority									
		Design Agent									
2	1	Cog. Eng. R.D. Mahon	<i>[Signature]</i>	7/30/97							
2	1	Cog. Mgr. L.L. Lockrem	<i>[Signature]</i>	7/17/97							
2	2	QA Mike Barnes	<i>[Signature]</i>	6-26-97							
		Safety									
		Env.									

18. Glenn S. Caprio <i>[Signature]</i> for 6/26/97 Signature of EDT Originator		19. _____ Authorized Representative Date for Receiving Organization		20. L.L. Lockrem <i>[Signature]</i> 7/17/97 Design Authority/ Cognizant Manager		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
---	--	---	--	--	--	--	--



# VAPOR AND GAS SAMPLING OF SINGLE-SHELL TANK 241-BX-105 USING the in Situ Vapor Sampling System

**G.S. Caprio**

SGN Eurisys Services Company, Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 614232 UC: 2070  
Org Code: 8C530 Charge Code: E62000  
B&R Code: EW3120074 Total Pages: 34

Key Words: 241-BX-105, VSS, SUMMA™, TST, SORBENT, TANK

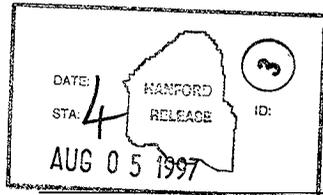
Abstract: THIS DOCUMENT PRESENTS SAMPLING DATA RESULTING FROM THE APRIL 24, 1996 SAMPLING OF SST 241-BX-105

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

*[Signature]*  
Release Approval

8/5/97  
Date



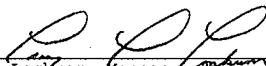
**Approved for Public Release**

APPROVALS

Document title: Vapor and Gas Sampling of Single-Shell Tank 241-EX-105  
Using the Vapor Sampling System

Approved by: \_\_\_\_\_  
G. S. Caprio, Field Scientist Date  
Vapor Sampling Project  
Special Analytical Studies

Approved by: \_\_\_\_\_  
R. D. Mahon, Project Lead Date  
Vapor Sampling Project  
Special Analytical Studies

Approved by: \_\_\_\_\_  
  
L. L. Lockrem, Manager Date 7/17/97  
Special Analytical Studies

**CONTENTS**

1.0	SCOPE . . . . .	1
2.0	SAMPLING EQUIPMENT DESCRIPTION . . . . .	1
2.1	VAPOR SAMPLING SYSTEM . . . . .	1
3.0	SAMPLING EVENT DESCRIPTION . . . . .	3
3.1	SPECIFICATIONS . . . . .	3
3.2	OPERATIONS AND SAMPLING PERSONNEL . . . . .	3
3.3	INDUSTRIAL HYGIENE FIELD RESULTS . . . . .	3
3.4	AMBIENT CONDITIONS . . . . .	3
3.5	SAMPLE COLLECTION . . . . .	3
3.6	FIELD GC/FID RESULTS . . . . .	4
3.7	RADIATION SCREENING . . . . .	4
4.0	SAMPLE CHAIN OF CUSTODY: RECEIPT, STORAGE, AND SHIPMENT . . . . .	6
5.0	QUALITY ASSURANCE AND CONTROLS . . . . .	7
5.1	VAPOR SAMPLING SYSTEM CLEANING . . . . .	7
5.2	INSTRUMENT CALIBRATION . . . . .	8
5.3	BLANK SAMPLES . . . . .	8
6.0	ANOMALIES . . . . .	8
7.0	REFERENCES . . . . .	9

**APPENDICES**

SAMPLE LOG SHEETS . . . . .	A-1
AMBIENT CONDITIONS . . . . .	B-1
CHAIN-OF-CUSTODY FORMS . . . . .	C-1

LIST OF TABLES

1. Flow Control Calibration . . . . .	2
2. TOC Results . . . . .	4
3. Radionuclide Analysis Results . . . . .	5
4. Pacific Northwest National Laboratory Samples . . . . .	6
5. Calibration Data . . . . .	7

## LIST OF TERMS

CGI	Combustible Gas Indicator
COC	Chain Of Custody
DOT	U.S. Department of Transportation
GC/FID	Gas Chromatograph/Flame Ionization Detector
GEA	Gamma Energy Analysis
NH <sub>3</sub>	Ammonia
NO <sub>2</sub>	Nitrogen Dioxide
NO	Nitric Oxide
H <sub>2</sub> O	Water Vapor
OPC	Offsite Property Control
OVM	Organic Vapor Meter
PNNL	Pacific Northwest National Laboratory
SAS	Special Analytical Studies
SML	Sampling and Mobile Laboratories
SST	Single-Shell Tank
TCP	Tank Characterization Plan
team	Vapor Team
TOC	Total Organic Carbon
TST	Triple Sorbent Trap
VSS	Vapor Sampling System
WHC	Westinghouse Hanford Company

This page intentionally left blank.

## VAPOR AND GAS SAMPLING OF SINGLE-SHELL TANK 241-BX-105 USING THE VAPOR SAMPLING SYSTEM

### 1.0 SCOPE

The Vapor Issue Resolution Program tasked the Vapor Team (the team) to collect representative headspace samples from Hanford Site single-shell tank (SST) 241-BX-105. This document presents sampling data resulting from the April 24, 1996 sampling of SST 241-BX-105. Analytical results will be presented in a separate report issued by Pacific Northwest National Laboratory (PNNL), which supplied and analyzed the sampling media.

### 2.0 SAMPLING EQUIPMENT DESCRIPTION

#### 2.1 VAPOR SAMPLING SYSTEM

The team, consisting of Sampling and Mobile Laboratories (SML) and Special Analytical Studies (SAS) personnel, used the vapor sampling system (VSS) to collect representative samples of the air, gases, and vapors from the headspace of SST 241-BX-105 with sorbent traps and SUMMA<sup>1</sup> canisters on April 24, 1996. Mahon et al. (1994) describes in detail the VSS, its performance, and its operation.

The VSS comprises a mobile laboratory connected to the vapor head space of the waste tank by stainless steel transfer tubing. A vacuum pump draws sample vapor from the tank headspace through the transfer tubing into the sampling manifold. Electrically activated, pneumatically actuated valves direct sample flow within the VSS. Instrumentation housed in the mobile laboratory monitors and controls system temperature, monitors absolute and differential system pressure, meters and controls vapor mass flow, and monitors total organic carbon (TOC) content of sample vapor using a gas chromatograph/flame ionization detector (GC/FID).

A key feature of the VSS is its use of heated transfer tubing and a heated sampling manifold. Maintaining the system at an elevated and controlled temperature prevents vapor condensation and reduces vapor adsorption on surfaces exposed to sample vapor. Mahon et al. (1994) describes various tests and observations that indicate the VSS sample transfer efficiency is consistently high.

Highly accurate mass flow controllers control the sample vapor flow rate through the sorbent traps at the sorbent trap station. The controllers FICV-1 through FICV-9 are mounted on top of the sorbent station between the inlet and outlet valves of their respective sampling ports. While controllers FICV-10 and FICV-11 are located downstream of the sorbent trap station and the in-line driers, which remove moisture from the sample vapor before it is metered. Errors associated with the mass flow controllers were determined by the Westinghouse Hanford Company (WHC) Standards Laboratory before the SST 241-BX-105 sampling event (see Table 1).

The VSS is equipped with a Hewlett Packard 5890 Series II gas chromatograph (GC) which is equipped with a flame-ionization detector (FID), 1 mL sample loop, 10 port injection valve, 2 meter chromatographic column, programmable

---

<sup>1</sup>SUMMA is a registered trademark of Moleetrics, Inc., Cleveland, Ohio.

oven, and a portable computer loaded with the HP-Chemstation<sup>2</sup> software providing computer control. The oven is programmed to heat from 50°C to 270°C at a rate of 70°C per minute. Helium is the carrier gas, air and hydrogen the combustion gases, and nitrogen the make-up gas. The GC is plumbed to accept sample from the VSS manifold to the sample loop. After the sample is transferred into the sample loop and reaches equilibrium, the run is initiated by the operator from the computer. HP-Chemstation software activates the 10 port valve which transfers a sample from the sample loop to the HP-5 column. The column is 2m long and has an inside diameter of 0.25mm which is coated with a chemically bonded phenyl methyl silicone layer to minimize sample interference. The sample passes through the column to the FID which generates a TOC signal for that sample. The data is then transmitted to the computer where it is stored for future retrieval and analysis. The GC/FID is configured to confirm sampling system cleanliness, and to quantitatively estimate TOC concentration in ambient air and tank vapor samples in real time.

Table 1. Flow Control Calibration.

Flow-indicating Control valve	Typically used Flow (stdcm <sup>3</sup> /min)	% Change from 647 to Actual	% Change from Datalogger to Actual
1	200	-0.7	-0.85
2	200	0.05	-0.10
3	200	-0.45	-0.60
4	200	0.05	-0.10
5	200	0.55	0.35
6	200	0.25	0.05
7	200	0.4	0.20
8	200	0.25	-1.81
9	50	-0.128	-0.27
10	200	-1.1	-1.20
11	5000	0.332	0.17

The system is multi-point calibrated at the weather station on an as available basis and last performed January 1995. The GC/FID displays a high degree of stability over a period of months. For further details, see Section 3.6, Field GC/FID Results.

Sorbent trap samples, pencil size stainless steel or glass tubes containing vapor adsorbing media, are collected at the sorbent trap station of the sampling manifold. The rate and duration of flow, as specified by the analytical laboratory providing the sample media, determines the total volume of vapor to be passed through the tube. Virtually all the target analytes are then trapped in the tube by the adsorbing media. Analyte concentration in the tank vapor can then be ascertained from the sorbent media analysis knowing the total volume of vapor which passed through the sorbent trap.

SUMMA<sup>®</sup> canisters, stainless steel vessels with their internal surfaces chemically passivated by the SUMMA<sup>®</sup> process to minimize adsorption of gases and vapors, are used to sample tank vapor from the SUMMA<sup>®</sup> sampling station on

<sup>2</sup>HP-CHEMSTATION is a Registered Trademark of the Hewlett Packard Company, Avondale, Pennsylvania.

the sampling manifold. The precleaned and evacuated SUMMA™ canisters are filled with sample vapor by opening a manually operated valve, which is then shut after pressure equilibration to seal the sample inside. SUMMA™ canisters allow a 6 liter sample to be transported to an analytical laboratory.

### 3.0 SAMPLING EVENT DESCRIPTION

#### 3.1 SPECIFICATIONS

The Vapor Issue Resolution Program specifies sampling requirements in WHC-SD-WM-TP-335 Rev 2, *Vapor Sampling and Analysis Plan* (Homi 1996), which also specifies the types and number of samples to be collected, flow rates, and durations. These key sampling parameters are summarized on the sample log sheets in Appendix A. In addition to the sample log sheets, checksheets for each individual sample help ensure correct sampling procedures. The team retains these documents in this event's project-specific file, S6-045.

#### 3.2 OPERATIONS AND SAMPLING PERSONNEL

Dan Niebuhr was the Tank Farm Operations person-in-charge. The team members included:

G. S. Caprio, Field Scientist  
R. D. Mahon, Vapor Sampling Lead.

The VSS was set up at SST 241-BX-105 on April 23, 1996 and was allowed to warm up overnight. Sampling began shortly after 12:30 p.m. on April 24, 1996, and was completed by 3:00 p.m. the same day.

#### 3.3 INDUSTRIAL HYGIENE FIELD RESULTS

Prior to hooking up to SST 241-BX-105, an industrial hygiene technician field tested tank vapors. The technician purged the instrument/vent header for 5 minutes and then field measured vapor stream contents using a combustible gas indicator (CGI) and an organic vapor meter (OVM). The measurements were verbally reported as; LEL 0%, NH<sub>3</sub> 200ppm, O<sub>2</sub> 20.8%, and TOC 8.4ppm.

#### 3.4 AMBIENT CONDITIONS

The weather the day of the sampling event, April 24, 1996, was cool and partly cloudy with winds from the southwest at about 20 miles per hour. Graphs of ambient temperatures and pressures taken at the Hanford Meteorological Station, which is about 5 miles west of EX-Farm, are provided in Appendix B.

#### 3.5 SAMPLE COLLECTION

The hot-water-jacketed sampling probe was located in Riser 6 of SST 241-BX-105. The probe length, from the sample inlet to the top of the riser flange, was 6.1 meters.

All zones of the VSS were heated to 60°C during setup of the VSS at SST 241-BX-105 on April 23, 1996. The team stabilized the VSS temperature zones by 12:30 p.m. on April 24, 1996, and the system was ready to collect samples. Measured according to the VSS operating procedure, the pressure and temperature of SST 241-BX-105 were 990 mbar (742.3 torr) and 17°C, respectively. The sample log sheets (Appendix A) provide a complete

chronology of the sample event including start and end times, flow rates, volumes, and specific sample identifiers.

Approximately 25 hours before the first samples were collected, the team began heating the VSS transfer tubing and sampling manifold. During this warmup period, the team began a purge of all vapor transfer tubing and the sampling manifold with ambient air. Prior to sampling tank vapors on April 24, 1996, the team collected two SUMMA™ canister samples of ambient air, one manually 10 meters upwind of the VSS connection with SST 241-BX-105, and the other using the VSS sampling manifold. The former was collected to establish background levels of trace organic vapors, and the latter was collected to establish the cleanliness of the sampling manifold.

A leak check of the VSS sampling manifold and transfer tubing was performed. The system was evacuated to 275 mbar (206.2 torr) and leakage of ambient air into the system was observed by monitoring system pressure for 15 minutes. Leakage resulted in an increase of 7.07 mbar (5.3 torr) in system pressure during the 15 minute test. Given a system volume of not more than 10 L, this pressure increase corresponds to a leak rate of approximately 17.14 ml/min. This leak rate was then estimated for average SUMMA™, Triple Sorbent Trap (TST), and sorbent sampling pressures. It was found that for the SUMMA™ canisters, dilution by ambient air was approximately 0.2%, for TST traps sampled at 100 ml/min was 1.4%, and for sorbent traps sampled at 200 ml/min the dilution was approximately 0.6%.

The sampling valve was opened and the VSS was purged with sample vapor from SST 241-BX-105 for 30 minutes at a total flow rate of 5.46 L/min. This purge was performed to flush ambient air from the system and saturate the system's active adsorption sites. Because the volume of transfer tubing and the sampling manifold upstream of the sampling devices is estimated to be no more than 10 L, this purge provided about 16.4 air turnovers in the system.

PNNL provided all SUMMA™ canisters, sorbent traps for organic vapors, ammonia (NH<sub>3</sub>), NO<sub>x</sub>, and water vapor (H<sub>2</sub>O), and TST sorbent traps.

### 3.6 FIELD GC/FID RESULTS

The GC was single point calibrated on the day of sampling using 6.0 ppmC Propane standard by Scott Specialty Gas. The standard is an E.P.A. Protocol Gas that is ± 2% NIST traceable.

Table 2 displays the Field GC/FID results from the sampling of 241-BX-105.

Table 2. TOC Results.

Number of Runs	Description	Average TOC Concentration (ppmC)	% Standard Deviation
3	Propane	6.00	1.18
4	Ambient	3.70	1.00
3	Tank Vapor	7.17	1.25

### 3.7 RADIATION SCREENING

Samples are unconditionally released from the SST farm in accordance with 1995-33300-RSP-03, *Release of Vapor Sampling Equipment* (WHC 1995c). Radiological screening results are used to determine (1) if the samples must be shipped as radioactive or nonradioactive in accordance with U.S. Department

of Transportation (DOT) regulations and (2) if the samples meet the laboratory acceptance criteria.

The DOT limits for shipping a nonradioactive sample are 2000 combined pCi/g of beta-gamma activity and alpha activity. Samples exceeding these DOT limits may be shipped as radioactive material if the samples do not exceed the following laboratory acceptance criteria:

PNNL:       Beta-gamma activity <400 pCi/g of sample media.  
              Alpha activity <100 pCi/g of sample media.

To protect the sampling manifold and sampling devices from radioactive particulates, all sample vapor for the April 24, 1996, SST 241-BX-105 vapor sampling event was drawn through a series of four filters placed upstream of the sampling manifold. These four filters were in place any time tank vapors were flowing through the system. When sampling was complete, the filters were removed and assigned unique sample identifiers. All four filters were submitted to Laboratory 222-S for total alpha, total beta, and gamma energy analysis (GEA). The filter closest to the sampling manifold was analyzed to determine if the samples met DOT shipping criteria and laboratory acceptance criteria. Moisture from the tank vapors was collected in a silica gel trap through one of the sorbent station ports and analyzed for tritiated water. SST 241-BX-105 filter and silica gel analysis results are shown in Table 3. The vapor team scientists use the activity results in Table 3 to calculate pCi/g of sample media. The team maintains this information in the project-specific file. The results in Table 3 indicate that the samples collected from SST 241-BX-105 met the laboratory acceptance criteria and the DOT definition of a nonradioactive shipment.

Table 3. Radionuclide Analysis Results.

Filter	Sample Identifier	Activity Results <sup>a</sup> (pCi/sample)	Activity <sup>b</sup> (pCi/L of tank gas)
Upstream filter (box)	S6045-A21.OU1	Total Alpha = 2430 Total Beta = 3100 GEA = <detectable	= 8.83 = 11.26 = <detectable
Downstream filter (box)	S6045-A22.OD1	Total Alpha = 0.55 Total Beta = 1.84 GEA = <detectable	= 0.002 = 0.01 = <detectable
Upstream filter (VSS)	S6045-A23.OU2	Total Alpha = 0.42 Total Beta = 2.95 GEA = <detectable	= 0.002 = 0.01 = <detectable
Downstream filter (VSS)	S6045-A24.OD2	Total Alpha = 0.49 Total Beta = 2.09 GEA = <detectable	= 0.002 = 0.01 = <detectable
Tritium trap	S6045-A03.OT1	Total activity = <10.2	= <10.2 <sup>c</sup>

NOTES:

<sup>a</sup>The samples are nonradioactive. These results were evaluated against laboratory acceptance criteria and DOT limits.

<sup>b</sup>All less than (<) values represent the minimum detection limits at Laboratory 222-S.

<sup>c</sup>Numbers based on an approximation of the total volume of tank vapor through the filters. Appendix A and the sample checksheets were used to estimate a total flow through the VSS of 275.2 L.

<sup>d</sup>Number is calculated using a total volume of 1 L passing through the tritium trap.

## 4.0 SAMPLE CHAIN OF CUSTODY: RECEIPT, STORAGE, AND SHIPMENT

All sorbent trains, TSTs, and SUMMA™ canisters received from PNNL are kept in a custody locked storage area maintained by SML. Sorbent trains, tubes and traps were maintained at  $4 \pm 2$  °C in a refrigeration unit. SUMMA™ canisters were stored in the same locked storage area, but were not refrigerated. The sample media was picked up from PNNL by SML and transported in a government vehicle to a custody locked storage area.

After sampling, the PNNL sorbent tubes, TSTs, and SUMMA™ canisters were transported by government vehicle directly to PNNL and delivered to J. A. Edwards on May 15, 1996. Table 4 lists the sample identifiers, sample types, and COC form numbers for all PNNL samples.

Table 4. Pacific Northwest National Laboratory Samples.

Sample Identifier	Sample Type	COC Number
S6045-A01.006	Ambient upwind SUMMA™	100075
S6045-A02.007	Ambient SUMMA™ (VSS)	100075
S6045-A04.008	SUMMA™	100075
S6045-A05.012	SUMMA™	100075
S6045-A06.023	SUMMA™	100075
S6045-A07.S61	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	100077
S6045-A08.S62	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	100077
S6045-A09.S63	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	100077
S6045-A10.S64	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O sorbent	100077
S6045-A15.S65	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O field blank	100077
S6045-A16.S66	NH <sub>3</sub> /NO <sub>x</sub> /H <sub>2</sub> O field blank	100077
S6045-A11.953	TST	100076
S6045-A12.954	TST	100076
S6045-A13.955	TST	100076
S6045-A14.956	TST	100076
S6045-A17.957	TST Field Blank	100076
S6045-A18.958	TST Field Blank	100076
S6045-A19.960	TST Trip Blank	100076
S6045-A20.961	TST Trip Blank	100076

From the time that samples are received by SML until they are shipped back to the analytical laboratory, all COCs are maintained by SML in accordance with WHC-IP-1127-1.3, *Chain-of-Custody/Special Analysis Request for RCRA and CERCLA Protocol Samples* (WHC 1995a). Copies of the completed COC forms for this sampling event are included in Appendix C.

## 5.0 QUALITY ASSURANCE AND CONTROLS

## 5.1 VAPOR SAMPLING SYSTEM CLEANING

Immediately prior to sampling of SST 241-BX-105, the VSS manifold and vapor sample transfer tubing was heated to 60 °C and ambient air was purged through the system for 78 minutes. Also, all pertinent system valves were actuated to release any contaminants that may have collected in the VSS valves themselves. After this purge an ambient air sample was drawn through the VSS manifold and a GC/FID run was initiated. No significant level of contaminants was detected. A second ambient air GC/FID run confirmed that the VSS manifold and transfer tubing was free of organic remnant residue down to ambient levels. A SUNMA<sup>®</sup> canister ambient air sample was then collected to confirm by laboratory analysis that the VSS sampling manifold was free of trace organic contaminants (or to determine which contaminants were present and at what concentration), as discussed in Section 3.5. For further details, refer to Appendix E of WHC-IP-1127-4.10 (WHC 1995b) and the project-specific file located with the team.

Table 5. Calibration Data.

Element	Calibration Date	Expiration Date	WHC Standards Laboratory Code
FICV-1	5/08/95	5/08/96	518-28-03-012
FICV-2	5/08/95	5/08/96	518-28-03-008
FICV-3	5/08/95	5/08/96	518-28-03-004
FICV-4	5/08/95	5/08/96	518-28-03-006
FICV-5	5/08/95	5/08/96	518-28-03-011
FICV-6	5/08/95	5/08/96	518-28-03-009
FICV-7	5/08/95	5/08/96	518-28-03-014
FICV-8	5/08/95	5/08/96	518-28-03-013
FICV-9	5/08/95	5/08/96	518-28-03-007
FICV-10	5/08/95	5/08/96	518-28-03-010
FICV-11	5/08/95	5/08/96	518-28-03-005
PE-1	5/04/95	5/04/96	518-80-02-005
PE-2	5/04/95	5/04/96	518-80-02-006
PE-3	5/04/95	5/04/96	518-80-02-008
PE-4	5/04/95	5/04/96	518-80-02-007
PD-1	5/04/95	5/04/96	518-80-02-004
PD-2	5/04/95	5/04/96	518-80-02-003
Temperature Control System	08/25/95	08/25/96	804-67-74-009

## 5.2 INSTRUMENT CALIBRATION

Instruments located in the VSS are calibrated on an annual basis at the WHC Standards Laboratory. VSS instrumentation calibration data, maintained in files by the team, are summarized in Table 5. According to the calibration schedule shown in Table 5, all instrumentation was within its calibration period during the SST 241-BX-105 sampling event.

Due to calibration discrepancies, the mass flow measurements for this sampling event may have an error of 6% to 14%. A detailed description of this discrepancy can be found in internal memo 75820-96-028.

## 5.3 BLANK SAMPLES

Trip blanks are samples that accompany the sample media from the point of generation through sample analysis. They are transported to the field with the sample collection media but remain unopened during the sampling event. Analysis of trip blanks is used to assess cross-contamination of sample media during field transport and storage.

Field blanks are sampling devices similar to trip blanks. They are prepared and handled in the same manner as the sampling media, but no tank vapors are drawn through them.

Spiked blanks are prepared as regular sampling media but also contain a known amount of special analyte. Tank vapors are drawn through these blanks and they are handled and analyzed just like any other sample. Analysis of the spiked blanks is used to evaluate potential sample loss during shipment or storage.

Ambient blanks are samples of ambient air collected at the sampling location. Analysis of ambient blanks is used to assess contamination that may be present in the atmosphere or in the transfer tubing or sampling manifold of the VSS immediately prior to sampling operations.

Table 4 lists sample blanks used during the sampling of SST 241-BX-105.

## 6.0 ANOMALIES

All samples were collected in accordance with the TCP and WHC-IP-1127-4.5, *Collection of SUMMA Canisters and Sorbent Tube Samples Using the Vapor Sampling System* (1995b). There were no anomalies during the VSS sampling event.

## 7.0 REFERENCES

- 49 CFR 100-177, 1992, "Transportation," *Code of Federal Regulations*, as amended.
- Homi, C. S., 1996, *Vapor Sampling and Analysis Plan*, WHC-SD-WM-TP-335 Rev. 1D, Westinghouse Hanford Company, Richland, Washington.
- Mahon, R. D., C. M. Jones, and M. S. Story, 1994 (draft), *Evaluation of the Capabilities and Use of the Vapor Sampling System for Tank Headspace Sampling and Characterization*, SD-WM-RPT-094, Westinghouse Hanford Company, Richland, Washington.
- Trible, T. C., Viswanath, R. S., 1996c, *Recommendation concerning the ISVS/VSS comparison study data with respect to calibration errors in Mass flow monitors and controllers*, (internal memo 75820-96-028 to L.D. Pennington, August 28), Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995a, *Chain-of-Custody/Special Analysis Request for RCRA and CERCLA Protocol Samples*, Procedure WHC-IP-1127-1.3, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995b, *Collection of SUMMA Canisters and Sorbent Tube Samples Using the Vapor Sampling System (VSS)*, Procedure WHC-IP-1127-4.5, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1995c, *Release of Vapor Sampling Equipment*, Procedure 1995-33300-RSP-03, Westinghouse Hanford Company, Richland, Washington.

This page intentionally left blank.

**APPENDIX A**  
**SAMPLE LOG SHEETS**

This page intentionally left blank.

VSS Sampling of  
 BX-105  
 Date: 4/24/96  
 VSS Personnel: Glenn Caprio and Rick Mahon

Set up VSS (Section A)(Temperature set point = 60°C)

Ensure HEPA filters are installed

Ensure connection to sample probe

System status check sheet. (Verify zones are to temp)

Tank Temperature 17.0 C

GC Standard Runs

GC Ambient Air Runs through port 10

Trailer Personnel: None

WHC Sample ID	ORNL/PNL Sample ID	Port Valve #	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
Purge with ambient air for 30 min.											
S6045- A01_006	006	Upwind	AMBIENT #1	5500	30	165000	5500	1120	1238	78	
GC Run #1 Ambient air/Cleanliness check											
S6045- A02 007	007	15	AMBIENT #2		1			1243	1244	1	
GC Run#2 Ambient air											
					1			1247			
								1252	1253	1	
LEAK CHECK(APPENDIX A) Leak Rate: 21.2 Torr/Hr											
Purge with tank air for 30 min											
				5500	30	165000	5500	1324	1354	30	165.00
Measure tank pressure PE-1 = 742.3 Torr											
GCRUN #3 (Tank run #1) 1358											
S6045- A03 OT1	S96WV0050	5	Tritium Trap	200	5	1000	200.00	1401	1406	5	1.00
S6045- A04 008	008	11	SUMMA #3		1			1410	1411	1	6.00
S6045- A05 012	012	13	SUMMA #4		1			1414	1415	1	6.00
S6045- A06 023	023	15	SUMMA #5		1			1418	1419	1	6.00
GCRUN #4 (Tank run # 2) 1421											

BX-105.XLS 4/29/96 7:52 AM

1 of 5

VSS Sampling of  
BX-105

WHC Sample ID	ORNL/PNL Sample ID	Port Valve #	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
S6045- A07 S61	#561	1	NH3/NOx/H2O (#1)	200	10	2000	200.00	1434	1444	10	2.00
S6045- A08 S62	#562	2	NH3/NOx/H2O (#2)	200	10	2000	200.00	1434	1444	10	2.00
S6045- A09 S63	#563	3	NH3/NOx/H2O (#3)	200	10	2000	200.00	1434	1444	10	2.00
S6045- A10 S64	#564	4	NH3/NOx/H2O (#4)	200	10	2000	200.00	1434	1444	10	2.00
S6045- A11 953	#953	5	TST #1	100	2	200	100.00	1434	1436	2	0.20
S6045- A12 954	#954	6	TST #2	100	2	200	100.00	1434	1436	2	0.20
S6045- A13 955	#955	7	TST #3	100	2	200	100.00	1434	1436	2	0.20
S6045- A14 956	#956	8	TST #4	100	2	200	100.00	1434	1436	2	0.20
S6045- A17 957	#957		TST FIELD BLANK #1					1444	1445	1	
S6045- A18 958	#958		TST FIELD BLANK #2					1444	1445	.1	
S6045- A15 S65	#565		NH3/NOx/H2O FIELD BLANK #1					1500	1501	1	
S6045- A16 S66	#566		NH3/NOx/H2O FIELD BLANK #2					1500	1501	1	
GCRUN #5 (Tank run #3)								1446			

TOTAL TANK GAS USED DURING SAMPLING RUNS

27.80

VSS Sampling of  
BX-105

WHC Sample ID	ORNL/PNL Sample ID	Port Valve #	Description	Desired Flow Rate SCCM	Desired Duration (min.)	Desired Total Flow SCCM	Actual Flow Rate SCCM	Actual Start Time	Actual End Time	Actual Total Time (min.)	Actual Total Flow Liters
S6045- A21 OU1	S96WV0046		Upstream HEPA(box)								
S6045- A22 OD1	S96WV0047		Downstream HEPA(box)								
S6045 A23 OU2	S96WV0048		Upstream HEPA(VSS)								
S6045- A24 OD2	S96WV0049		Downstream HEPA (VSS)								
<b>Trip Blanks (DO NOT EXPOSE)</b>											
S6045- A19 960	TST#960		TST TRIP #1								
S6045- A20 961	TST#961		TST TRIP #2								

BX-105  
TOTAL TANK VAPOR USED

	NUMBER OF EVENTS	TIME IN MINUTES	VOLUME IN SCCM	TOTAL VOLUME, LITERS
LEAK CHECKS	1	15	5600	5.60
TANK PURGE PUMP DOWNS	3	1	5600	16.80
TANK PURGE TIME (From Spreadsheet)	1	30	5500	165.00
GC PURGES	3	2	5000	30.00
SUMMA PURGES	3	2	5000	30.00
ALL SAMPLES COLLECTED				27.80
TOTAL FOR TANK SAMPLING RUN				275.20

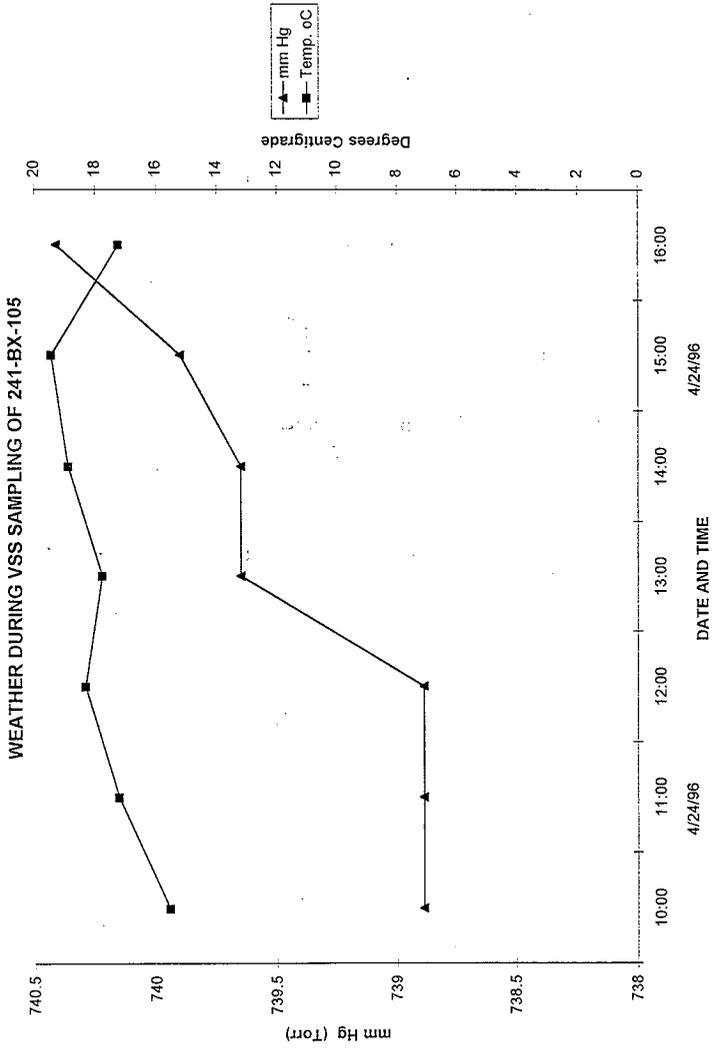
VSS SAMPLING RADIOLOGICAL SCREENING RESULTS  
BX-105

S6045-A21.0U1 / S98WV0046 FILTER BOX UPSTREAM FILTER	Liters 275.20	pCi / liter 8.83	pCi / liter 11.26	pCi / liter 11.26	S6045-A22.0D1 / S98WV0047 FILTER BOX DOWNSTREAM FILTER	Liters 275.20	pCi / liter 0.55	pCi / liter 0.01
TOTAL VOLUME	2430.00	< 14.17	< 11.26	< 11.26	TOTAL VOLUME	275.20	1.84	< Detectable
ALPHA	3100.00	< 14.17	< Detectable	< Detectable	ALPHA	275.20	< 17.75	< Detectable
BETA	< 14.17	< 11.26	< 11.26	< 11.26	BETA	< 17.75	< 17.75	< Detectable
GEA - Co-60	< 14.17	< 11.26	< 11.26	< 11.26	GEA - Co-60	< 17.75	< 17.75	< Detectable
Cs-134	< 14.17	< 11.26	< 11.26	< 11.26	Cs-134	< 17.75	< 17.75	< Detectable
Cs-137	< 14.17	< 11.26	< 11.26	< 11.26	Cs-137	< 17.75	< 17.75	< Detectable
Eu-152	< 14.17	< 11.26	< 11.26	< 11.26	Eu-152	< 17.75	< 17.75	< Detectable
Eu-154	< 14.17	< 11.26	< 11.26	< 11.26	Eu-154	< 17.75	< 17.75	< Detectable
Eu-155	< 14.17	< 11.26	< 11.26	< 11.26	Eu-155	< 17.75	< 17.75	< Detectable
S6045-A23.0U2 / S98WV0048 VSS UPSTREAM FILTER	Liters 275.20	pCi / liter 0.42	pCi / liter 0.00	pCi / liter 0.00	S6045-A24.0D2 / S98WV0049 VSS DOWNSTREAM FILTER	Liters 275.20	pCi / liter 0.46	pCi / liter 0.00
TOTAL VOLUME	2430.00	< 2.95	< 0.01	< 0.01	TOTAL VOLUME	275.20	0.46	< Detectable
ALPHA	3100.00	< 2.95	< 0.01	< 0.01	ALPHA	275.20	< 0.46	< Detectable
BETA	< 2.95	< 0.01	< 0.01	< 0.01	BETA	< 0.46	< 0.46	< Detectable
GEA - Co-60	< 2.95	< 0.01	< 0.01	< 0.01	GEA - Co-60	< 0.46	< 0.46	< Detectable
Cs-134	< 2.95	< 0.01	< 0.01	< 0.01	Cs-134	< 0.46	< 0.46	< Detectable
Cs-137	< 2.95	< 0.01	< 0.01	< 0.01	Cs-137	< 0.46	< 0.46	< Detectable
Eu-152	< 2.95	< 0.01	< 0.01	< 0.01	Eu-152	< 0.46	< 0.46	< Detectable
Eu-154	< 2.95	< 0.01	< 0.01	< 0.01	Eu-154	< 0.46	< 0.46	< Detectable
Eu-155	< 2.95	< 0.01	< 0.01	< 0.01	Eu-155	< 0.46	< 0.46	< Detectable
S6045-A03.0T1 / S98WV0050 TRITIUM TRAP	Liters 1	pCi / liter < 10.20	#VALUE!	#VALUE!				
TOTAL VOLUME	1	< 10.20						
TOTAL ACTIVITY								
SAMPLE EXPOSURE ANALYSIS USING VSS DOWNSTREAM FILTER ANALYSIS AS POSSIBLE EXPOSURE LEVEL = BETA and ALPHA Less than DOT shipping limits								
SORBENT SAMPLING Used 5 g for sorbent mass								
TOTAL VOLUME PER SAMPLE	2.00	Liters			TST SAMPLING Used 4.5 g for TST mass			
Tridium per Sample	#VALUE!	pCi per gram	#VALUE!	#VALUE!	Tridium per Sample	0.20	Liter	
NH3 (5 gram)	0.00	pCi per gram	0.00	0.00	ALPHA per Sample	#VALUE!	pCi per gram	
H2O (5 gram)	0.00	pCi per gram	0.00	0.00	TST (4.5 gram)	0.00	pCi per gram	
ALPHA (5 gram)	0.00	pCi per gram	0.00	0.00	BETA per Sample	0.00	pCi per gram	
H2O (5 gram)	0.00	pCi per gram	0.00	0.00	GEA per Sample	< Detectable	pCi per gram	
H2O (5 gram)	0.00	pCi per gram	0.00	0.00				
NH3 (5 gram)	0.00	pCi per gram	0.00	0.00				
H2O (5 gram)	0.00	pCi per gram	0.00	0.00				
GEA per Sample	< Detectable	pCi per gram						
SUMMA SAMPLING								
TOTAL VOLUME PER CANISTER	6	Liters (at 300K, 1 bar = 1.161 g/L)						
Tridium PER SAMPLE	#VALUE!	pCi per gram						
BETA PER SAMPLE	0.01	pCi per gram						
ALPHA PER SAMPLE	0.00	pCi per gram						
GEA PER SAMPLE	< Detectable	pCi per gram						

This page intentionally left blank.

**APPENDIX B**  
**AMBIENT CONDITIONS**

This page intentionally left blank.



This page intentionally left blank.

**APPENDIX C**  
**CHAIN-OF-CUSTODY FORMS**

This page intentionally left blank.

<b>Battelle Pacific National Northwest Lab</b>	<b>CHAIN OF CUSTODY</b>	<b>WHC 100075</b>
--	-------------------------	-------------------

Custody Form Initiator	J. A. Edwards - PNNL	Telephone (509) 373-0141 Page 85-3009 / FAX 378-0418
Company Contact	R. D. Mahon - WHC	Telephone (509) 373-2891 Page 85-9656 / FAX 373-3793
Project Designation/Sampling Locations	200 West Tank Farm 241-B X-105 Tank Vapor Sample SAF S6045 (VSS Truck)	Collection date 04 - 24 - 96 Preparation date 04 - 22 - 96
Ice Chest No.		Field Logbook No. WHC- <u>N-647-1e</u>
Bill of Lading/Airbill No.	N/A	Offsite Property No. N/A
Method of Shipment	Government Truck	
Shipped to	PNNL	
Possible Sample Hazards/Remarks	Unknown at time of sampling	

Sample Identification

S6045 - A01 . 006 .	Collect Ambient Air Sample SUMMA #1	Upwind of Tank
S6045 - A02 . 007 .	Collect Ambient Air Sample SUMMA #2	Through VSS
S6045 - A04 . 008 .	Collect SUMMA #3	
S6045 - A05 . 012 .	Collect SUMMA #4	
S6045 - A06 . 023 .	Collect SUMMA #5	

[ ] Field Transfer of Custody		[ X ] Chain of Possession		(Sign and Print Names)		
Relinquished By	Date	Time	Received By	Date	Time	
J A Edwards <i>J A Edwards</i>	04-23-96	1440	<i>C S Mclilla</i> C.S. McCalla	04-22-96	1440	
<i>C S Mclilla</i> C.S. McCalla	4-23-96	1530	<i>R D Mahon</i> R.D. Mahon	04-23-96	1530	
<i>R D Mahon</i> R.D. Mahon	05-15-96	1314	<i>ES Caprio</i> E.S. Caprio	05-15-96	1314	
<i>ES Caprio</i> E.S. Caprio	5-15-96	1425	<i>J A Edwards</i> J.A. Edwards	5-15-96	1425	

Final Sample Disposition

Comments:

<p><u>PNNL (onlv) Checklist</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Media labeled and checked?</li> <li><input type="checkbox"/> Letter of instruction?</li> <li><input type="checkbox"/> Media in good condition?</li> <li><input type="checkbox"/> COC info/signatures complete?</li> <li><input type="checkbox"/> Rad release stickers on samples?</li> <li><input type="checkbox"/> Activity report from 2225?</li> <li><input type="checkbox"/> RSR/copy? (a ≤100/B ≤400 pCi/g)</li> <li><input type="checkbox"/> COC copy for LRB, RIDS filed?</li> </ul>	<p><u>Pick-up / Delivery</u></p> <p><input checked="" type="checkbox"/> Y/N</p> <p>POC <i>AE</i></p>	<p><u>Comments:</u></p> <p>POC <i>AE</i></p>
---	---	--

(Revised 11/30/95 PNNL)

**Battelle Pacific  
Northwest Laboratory**

**CHAIN OF CUSTODY**

**WHC 100076**

Custody Form Initiator J. A. Edwards - PNL  
 Company Contact R. D. Mahon - WHC  
 Project Designation/Sampling Locations 200 West Tank Farm  
 241-BX-105 Tank Vapor Sample SAF S6045  
 (VSS Truck)  
 Ice Chest No.  
 Erco Hi/Lo thermometer No. PNL-T-00<sup>5</sup>  
 Bill of Lading/Airbill No. N/A  
 Method of Shipment Government Truck  
 Shipped to WHC  
 Possible Sample Hazards/Remarks Unknown at time of sampling

Telephone (509) 373-0141  
 Page 85-3009 / P8-08 / FAX 376-0418  
 Telephone (509) 373-7437  
 Page 85-9656 / S3-27 / FAX 373-7076  
 Collection date 04 - 24 - 96  
 Preparation date 04 - 20 - 96  
 Field Logbook No. WHC- N-697-10

**Sample Identification**

S6045 - A11 - 953 PNL Triple Sorbent Trap (TST) Sample # 1  
 S6045 - A12 - 954 PNL TST Sample # 2  
 S6045 - A13 - 955 PNL TST Sample # 3  
 S6045 - A14 - 956 PNL TST Sample # 4  
 S6045 - A17 - 957 Open, close & store TST Field Blank # 1 In VSS truck  
 S6045 - A18 - 958 Open, close & store TST Field Blank # 2 In VSS truck  
 S6045 - A19 - 960 Store TST Trip Blank #1  
 S6045 - A20 - 961 Store TST Trip Blank #2

[ ] Field Transfer of Custody		[ X ] Chain of Possession		(Sign and Print Names)	
Relinquished By	Date	Time	Received By	Date	Time
JL Jylva	04-23-96	1230	JA Edwards	04-23-96	1230
JA Edwards	04-23-96	1445	CS McMillan	04-23-96	1445
CS McMillan	04-23-96	1530	RD Mahon	04-23-96	1530
RD Mahon	05-15-96	1314	ES Caprio	05-15-96	1314
ES Caprio	05-15-96	1415	JA Edwards	05-15-96	1415

**Final Sample Disposition**

**Comments:**

- PNL (only) Checklist**
- Media labeled and checked?  Y  N
  - Letter of instruction?  Y  N
  - Media in good condition?  Y  N
  - COC info/signatures complete?  Y  N
  - Sorbents shipped on ice (<5°C)?  Y  N
  - Hi/Lo thermometer - Keep upright!  Y  N
  - Hi/Lo thermometer  Y  N
  - Rad release stickers on samples?  Y  N
  - Activity report from 2225?  Y  N
  - COC copy for LRB, RIDS filed?  Y  N

**Comments:**

Cooler Temperature Status  
 HI: -22 °C / Lo -22 °C (pick up at PNL to WHC)  
 HI: \_\_\_ °C / Lo \_\_\_ °C (delivery at WHC from PNL)  
 HI: \_\_\_ °C / Lo \_\_\_ °C (at return to PNL from WHC)  
 HI: +5 °C / Lo -14 °C (at delivery from WHC to PNL)

POC  POC

(Revised 06/21/95 PNL)

Battelle Pacific  
National Northwest Lab

CHAIN OF CUSTODY

WHC 100077

Custody Form Initiator J. A. Edwards - PNNL Telephone (509) 373-0141  
Page 85-3009 / FAX 376-0418

Company Contact R. D. Mahon - WHC Telephone (509) 373-7437  
Page 85-9656 / FAX 373-3793

Project Designation/Sampling Locations 200 West Tank Farm  
241-BX-105 Tank Vapor Sample SAF S6045  
VSS Collection date 04 - 24 - 96  
Preparation date 04 - 22 - 96

Ice Chest No. Field Logbook No. WHC- N-647 b

Bill of Lading/Airbill No. N/A Offsite Property No. N/A

Method of Shipment Government Truck

Shipped to PNNL

Possible Sample Hazards/Remarks Unknown at time of sampling

Sample Identification

S6045 - A07 . S61 - Collect NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O Sorbent Trap  
S6045 - A08 . S62 - Collect NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O Sorbent Trap  
S6045 - A09 . S63 - Collect NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O Sorbent Trap  
S6045 - A10 . S64 - Collect NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O Sorbent Trap

S6045 - A15 . S65 - Open, close and store NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O field blank #1  
S6045 - A16 . S66 - Open, close and store NH<sub>3</sub>/NO<sub>x</sub>/H<sub>2</sub>O field blank #2

[ ] Field Transfer of Custody		[ X ] Chain of Possession		(Sign and Print Names)	
Relinquished By	Date	Time	Received By	Date	Time
G W Dennis / <u>J.A. Edwards</u>	04-22-96	1330	<u>J.A. Edwards</u> / <u>J.A. Edwards</u>	04-22-96	1330
<u>J.A. Edwards</u> / <u>J.A. Edwards</u>	04-23-96	1440	<u>CSullivan</u> / <u>CS. Wickla</u>	04-23-96	1440
<u>CS. Wickla</u> / <u>CS. Wickla</u>	04-23-96	1530	<u>RD Mahon</u> / <u>RD Mahon</u>	04-23-96	1530
<u>RD Mahon</u> / <u>RD Mahon</u>	05-15-96	1314	<u>GS CAPRIO</u> / <u>GS CAPRIO</u>	05-15-96	1314
<u>GS CAPRIO</u> / <u>GS CAPRIO</u>	5-15-96	1410	<u>J.A. Edwards</u> / <u>J.A. Edwards</u>	5-15-96	1410

Final Sample Disposition

Comments:

- |                                  |   |           |
|----------------------------------|---|-----------|
| PNNL (only) Checklist            | Pick-up / Delivery  | Comments: |
| Media labeled and checked?       | <input checked="" type="checkbox"/> N   |           |
| Letter of instruction?           | <input checked="" type="checkbox"/> N   |           |
| Media in good condition?         | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |
| COC info/signatures complete?    | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |
| Rad release stickers on samples? | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |
| Activity report from 222S?       | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |
| RSR/copy? (a ≤100/B ≤400 pCi/g)  | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |
| COC copy for LRB, RIDS filed?    | <input checked="" type="checkbox"/> N / <input checked="" type="checkbox"/> N |           |

POC (Signature) POC (Signature)

(Revised 11/30/95 PNNL)

<b>Westinghouse Hanford Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>										C.O.C# <b>/00/14/</b>	
Collector(s) <b>Glenn Caprio/Rick Mahon</b>		Contract/Requestor <b>Rick Mahon</b>		MSRN <b>S3-27</b>		FAX <b>373-7076</b>		Tel. No. <b>373-7437</b>		Purchase Order/Charge Code <b>E29937/75745</b>		Page <b>1</b> of <b>1</b>	
SAF Number <b>S6045</b>		Sample Origin <b>βX-105</b>		Legbook# <b>N/A</b>		Ice Chest# <b>N/A</b>		Temp. <b>N/A</b>		Bill of Lading/Air Bill No. <b>N/A</b>			
Project Title <b>Vapor Sampling</b>		Method of Shipment <b>Government Vehicle</b>		Date Turnaround <b>24 hr</b>		Offsite Property No. <b>N/A</b>		Preservative					
Shipped To (Lab) <b>222-S</b>		Date Turnaround <b>24 hr</b>		Sample Analysis									
Protocol <b>None</b>		No/Type Container											
Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis							
S6045-A21-001	S96W	X	4/24/04	1550	(D) petri dish	AT/IB/GEA							N/A
A22_001	S96W	X			(D) petri dish	AT/IB/GEA							N/A
A23_002	S96W	X			(D) petri dish	AT/IB/GEA							N/A
A24_002	S96W	X			(D) petri dish	AT/IB/GEA							N/A
S6045-A03.001	S96W	X			(S) silica gel	Total Activity							N/A
S5045 - 011	S96W	X			(S) silica gel	Total Activity							N/A
					( )								N/A
					( )								N/A
					( )								N/A
					( )								N/A
					( )								N/A
					( )								N/A
POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.		MSDS Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		SPECIAL INSTRUCTIONS Please fax the report to Rick Mahon at 373-7076 once the analysis is completed. The date and time of each analysis should be included in the report. Thanks.									
Relinquished By	Print <b>Glenn Caprio</b>	Signature <i>Glenn Caprio</i>	Date/Time <b>4/24/04/1455</b>	Received By	Print <b>Don B. Hardy</b>	Signature <i>Don B. Hardy</i>	Date/Time <b>4/24/04</b>	Matrix*		S <input type="checkbox"/> Soil      DS <input type="checkbox"/> Dens Solids SE <input type="checkbox"/> Sediment      DL <input type="checkbox"/> Dens Liquids SO <input type="checkbox"/> Solid      T <input type="checkbox"/> Tissue SL <input type="checkbox"/> Sludge      W <input type="checkbox"/> Waste W <input type="checkbox"/> Water      L <input type="checkbox"/> Liquid O <input type="checkbox"/> Oil      V <input type="checkbox"/> Vegetation A <input type="checkbox"/> Air      X <input type="checkbox"/> Other			
Relinquished By				Received By				Date/Time					
Relinquished By				Received By				Date/Time					
Relinquished By				Received By				Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method e.g. Return to customer per lab procedure, used in process.		Disposed By		Date/Time							
All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.													

## DISTRIBUTION SHEET

To Distribution	From Special Analytical Support, Numatec Hanford	Page 1 of 1 Date 8/7/97
Project Title/Work Order VAPOR AND GAS SAMPLING USING THE IN SITU VAPOR SAMPLING SYSTEM		EDT No. <u>614232</u> ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
<u>Lockheed Martin Hanford Company</u>					
L. L. Buckley	R2-12	X			
<u>Lockheed Martin Services, Inc.</u>					
Central Files	A3-88	X			
<u>SGN Eurisys Services Corporation</u>					
E. S. Mast	S3-90	X			
<u>PNNL</u>					
J. L. Huckaby	K6-80	X			