JUN 19 1995

Sta. #4

59 ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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1	1	Responsible Eng. DK DEFORD	<i>[Signature]</i>	5/9/95	H5-09	Central Files	<i>[Signature]</i>	5/9/95	H5-09	3	
1	1	Responsible QA T. C. TRIPLE	<i>[Signature]</i>	5/9/95	H5-09	C. S. T. I. (2)	<i>[Signature]</i>	5/9/95	H5-09		
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Document Number: WHC-SD-WM-ATP-132, REV 0

Document Title: IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

Release Date: 6/16/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

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June 16, 1995

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7. Abstract

THIS TEST PROCEDURE VERIFIES THE ADEQUACY OF THE IMPROVED IN SITU VAPOR SAMPLING SYSTEM.

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DATE JUN 19 1995

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IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

APPROVAL DESIGNATOR SQ

DK DEFORD
MAY, 1995

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TJ

MASTER

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

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1.0 PURPOSE

The purpose of this system acceptance test procedure (STP) is to demonstrate that the In Situ Vapor Sampling (ISVS) System is in good working order, and capable of measuring flow volumes as designed. Actual test execution steps are in section 9.

2.0 REFERENCES

- WHC-SD-WM-ETP-138 In Situ Vapor Sampling (ISVS) System Development Task Plan

3.0 RESPONSIBILITIES

Each organization participating in the conduct of this STP will designate personnel for the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the Recorder for listing on the Recorder's copy of the Test Execution Sheet prior to the performance of any part of this STP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in system testing.
- 3.1.4 Ensure informal testing and inspection has been completed.
- 3.1.5 Schedule and conduct a pre-STP meeting with test participants.
- 3.1.6 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.7 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.8 Sign Test Execution Sheet when STP is approved and accepted.
- 3.1.9 Take necessary action to clear exceptions to the STP.
- 3.1.10 Sign Exception Sheet when exception has been resolved.

- 3.1.11 Provide a distribution list for the approved and accepted STP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all system testing.
- 3.2.2 Stop any test which may cause damage to the system until the test procedure has been revised or the condition has been corrected.
- 3.2.3 Approve field changes to the STP.
- 3.2.4 Obtain revisions to the STP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.5 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.6 Obtain from the WHC project engineer any information or changes necessary to clear or resolve exceptions.
- 3.2.7 Sign Test Execution Sheet when STP has been performed.
- 3.2.8 Sign Test Exception Sheet when acceptable retest has been performed.
- 3.2.9 Obtain required signatures on the STP Master prior to reproduction and distribution.

3.3 WHC SAFETY

- 3.3.1 Witness the tests if desired.
- 3.3.2 Evaluate results of testing with the test director after completion of the system test.
- 3.3.3 Sign Test Execution Sheet when STP has been performed and when the STP is approved and accepted.
- 3.3.4 Sign Test Exception Sheet when acceptable retest has been performed.

3.4 RECORDER

- 3.4.1 Perform all recording using black ink.
- 3.4.2 Record names of all designated personnel on Recorder's copy of STP prior to start of testing.
- 3.4.3 Observe tests, record test data and maintain test data sheets.
- 3.4.4 Sign the Test Execution Sheet and Exception sheet(s) as the Recorder.
- 3.4.5 Initial every test step on the Recorder's copy as it is completed, next to the step number or on a table, when provided. Sign and date each section of the STP when it is completed.
- 3.4.6 Record authorized field changes to the STP.
- 3.4.7 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.8 Assign page numbers to Data Sheets and Exception Sheets, after STP is complete. Record page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with Recorder's signature and dates for each step to the Master in ink or typed. Submit the completed Master to the test director for approval signatures and distribution. Retain the Recorder's copy and a copy of the Master in the field project files.

3.5 WHC QA

- 3.5.1 Witness the tests if desired.
- 3.5.2 Evaluate results of testing and field changes to STP.
- 3.5.3 Sign Test Execution Sheet when STP is approved and accepted.
- 3.5.4 Sign Test Exception Sheet when exception has been resolved.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and the environment. Facility line managers shall ensure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the operations manuals and as directed by the WHC test director.

4.0 STP CHANGE CONTROL

System testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required field changes must be approved by the test director. Field changes shall be recorded as an exception.

5.0 TEST EXECUTION

The system test procedures detailed in Section 9 shall be performed in sequential steps starting with Section 9.1. As required by Section 3.4, the Recorder shall initial every test step in the space provided on the Recorder's copy of the STP as each step is completed and sign and date each section as it is completed. Any step that requires data to be recorded must also be recorded on the Test Data Sheet.

NOTE: Where the test procedure specifies "Measure" (the temperature, pressure, etc.) an independent calibrated device (other than a part of ISVS) is required. Where "Read" (the temperature, pressure, etc.) is specified, the internal instruments are to be used. Where calculation is called for, record the raw data and show the calculation used.

5.1 WITHOUT EXCEPTION

- 5.1.1 Recorder check applicable space on Test Execution Sheet to show that the STP has been performed and no exceptions have been recorded.
- 5.1.2 All parties sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of STP to the project engineer.

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5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Recorder check applicable space on Test Execution Sheet to show that the STP has been performed with exceptions recorded and resolved.
- 5.2.2 All parties sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of STP to the project engineer.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Recorder check applicable space on Test Execution Sheet to show that the STP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.
- 5.3.2 All parties sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of STP to the project engineer.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the STP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may be different than planned action.
- 6.3.2 When action taken results in an acceptable retest, check 'ACCEPTABLE' and sign and date the Retest Execution section of the Test Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, check 'UNACCEPTABLE' under the Retest Execution section of the Test Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer, when requested by the test director, provides final approval and acceptance of exception by checking one of the following on Test Exception Sheet:
 - Retest approved and accepted: applicable when Retest Execution section is completed.
 - Exception accepted as is: requires detailed explanation.
 - Other: requires detailed explanation.
- 6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets with the completed test report.

7.0 SYSTEM DESCRIPTION

The In Situ Vapor Sampling System is a essentially a hand cart fitted with a vacuum pump capable of drawing tank gases (essentially air with traces of other chemicals) through the HEPA filter, the sorbent trains, and the tubing bundle. It has four stations with valves and flowmeters which can be used

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to measure the volume of air drawn through the manifold. A separate connection is available for SUMMA sampling.

The cart has several built-in safety devices: each station has a water trap to protect the system in the event that the tubing bundle is lowered into something other than tank air, and there is also a final HEPA filter in each line to protect the equipment.

The flow of air through the system is controlled by manually operated ball and needle valves. The system utilities and controls include electrical power, a flow system panel with manual valves, electronic flow monitors, and corresponding flow totalizers. Temperature measurement is provided at the tank end of the sample tube bundle, within the collector manifold, and inside and outside of the electronics enclosure.

SUMMA is a registered trademark of Molex, Inc. Cleveland OH

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8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 PRESTART TEST CONDITIONS

The following conditions shall exist at the start of the system testing.

- ___ 8.1.1 System has been inspected for workmanship and for compliance with design.
- ___ 8.1.2 Personnel responsible for directing and witnessing the performance of the tests described in this STP have read and understand appropriate vendor information (VI) pertaining to the operation of the equipment to be tested.
- ___ 8.1.3 All test instruments have been calibrated and are within their calibration period. Calibration information shall be recorded in the test data sheet.
- ___ 8.1.4 Procedures for the operation of ISVS are available.
- ___ 8.1.5 A Safety representative has been identified and will witness test or chooses not to.

Safety/Date

- ___ 8.1.6 A Quality Assurance representative has been identified and will witness test or chooses not to.

QA/Date

8.2 EQUIPMENT REQUIRED

Calibrated thermocouple readers.
Calibrated MKS flow controllers accurate within 2%.
Calibrated MKS pressure measurement.
A cooler with dry ice for lowering the internal temperature.
A "cold cell" capable of holding the ISVS electronics enclosure.

Test Director/Date

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FIGURE 1

FLOW DIAGRAM

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9.0 TEST PROCEDURE FOR THE SAMPLING SYSTEM

This procedure will demonstrate that the in situ vapor sampling system works per the design parameters of WHC-SD-WM-ETP-138.

9.1 HEATER CHECKOUT

The heater is intended to maintain internal temperature within the operating range of the electronic components. This section verifies the effectiveness of the heating system and determines the maximum temperature differential the system is capable of maintaining.

- ___ 9.1.1 When the ISVS has been sitting undisturbed overnight inside a building, and before supplying power to the ISVS, perform a check of its temperature measurement devices. Measure and record the room temperature. Read and record T1, T2, T3, and T4. Values shall agree within 2°C.
- ___ 9.1.2 During sampling T2 would be the thermocouple placed into the tank with the sample media. For this test it will be used to monitor the temperature inside the electronics enclosure. Install T2 inside, near the bottom of the electronics enclosure.
- ___ 9.1.3 Place the ISVS (or just the electronics enclosure if required) into the cold cell in 622F. The removable insulation sheet on the floor of the enclosure must be in place. The cold cell shall be maintained below 0°C during this test. Supply power to the ISVS, and make a temporary seal around the entry point for the power cord.
- ___ 9.1.4 Measure and record the cold cell temperature.
- ___ 9.1.5 Turn the ISVS heater thermostat to maximum and close the door.
- ___ 9.1.6 Allow the heater to run while monitoring the temperature readings inside the cold cell and at T2. It will take some time to reach its maximum temperature. The maximum is reached when the temperature rises to 100°F or if the temperature has not risen for five minutes while the heater continues to operate.
- ___ 9.1.7 Measure and record the cold cell temperature and the maximum internal temperature. Calculate the temperature differential maintained by the heater. The heater shall

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maintain a differential of at least 30°C to ensure the internal temperature will be above 0°C in all weather conditions.

9.1.8 The lowest outside temperature ever recorded at Hanford was -30°C. Use the differential obtained above to determine the lowest internal temperature at which the electronics would be expected to operate. This temperature will be used later in this STP.

9.1.9 If the ISVS was disassembled to fit into the cold cell, reassemble it.

9.2 STARTUP AND OPERATIONAL MODE

9.2.1 Install all flex tubing and CLOSE all valves. Cap SUMMA station.

9.2.2 Valve V-8 shall remain closed and capped throughout this STP.

9.2.3 Install a tee test connection to the MKS pressure standard in the flex tubing between the manifold and the check valve.

9.2.4 Turn the MKS flow control and pressure systems ON for warmup. Warmup time is 30 minutes.

9.2.5 Supply power to ISVS.

9.2.6 Connect the power strip cord to the external outlet. Verify that all flow monitors and totalizers are ON. Warmup time is 30 minutes.

9.2.7 Switch the totalizers back and forth from flow display to total display. Verify that the RESET TOTALIZERS button causes the totals to reset to zero. Set the totalizers to display flow rates.

9.2.8 Set the thermostat on the internal heater to minimum.

9.2.9 Turn vacuum pump ON. Ensure the pump is operating. Turn the pump OFF.

9.2.10 Ensure the warmup times above have been met before continuing.

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NOTE: Startup is now complete. This condition is defined as Operational Mode:

- System is plumbed and all valves are closed.
- All equipment turned on and adequately warmed up.

Each subsequent section of this STP will begin with ISVS in this Operational Mode, and will return to Operational Mode when completed.

9.3 VACUUM LEAK TEST OF SYSTEM

Verifies the sample system and each valve is leak tight to a level that will not adversely impact sampling data.

- ___ 9.3.1 Ensure ISVS is in operational mode.
- ___ 9.3.2 Open V1, V2, V3, V4, V5, V6, and V7. Turn the vacuum pump ON.
- ___ 9.3.3 Adjust flows at all rotameters to the 150 mark.
- ___ 9.3.4 Close V1, V2, V3, V4, and V6.
- ___ 9.3.5 Evacuate the system for 5 minutes. Close V7. Turn the vacuum pump OFF.
- ___ 9.3.6 Measure and record the internal pressure with the MKS pressure standard system.
- ___ 9.3.7 Read and record the pressure at PI-1. Convert the gage reading to Torr. The values shall agree within 12 Torr (1/2 in Hg).
- ___ 9.3.8 Allow the system to remain undisturbed for 10 minutes.

NOTE: The system shall lose vacuum at a rate no greater than 3 in Hg/hr (12 Torr in 10 minutes). If the system loses vacuum at a rate greater than this limit, the connections throughout the sample stream shall be corrected as necessary to meet the leak requirements. Once corrections have been made to the sample line the leak test shall be repeated until it passes.

- ___ 9.3.9 Measure and record the pressure at the MKS pressure standard.

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- 9.3.10 Relieve the vacuum by opening V6. Close V5 when pressure has normalized.
- 9.3.11 Open V7. Turn the vacuum pump ON. Evacuate the system for 5 minutes. Close V7. Turn the vacuum pump OFF. Measure and record the pressure at the MKS pressure standard.
- 9.3.12 Allow the system to remain undisturbed for 10 minutes.
NOTE: The criteria of 9.3.8 apply.
- 9.3.13 Measure and record the pressure at the MKS pressure standard. Relieve the vacuum by opening V5.
- 9.3.14 Open V1-V4. Blank sample ports 1-5 with leak-tight terminations.
- 9.3.15 Open V7. Turn the vacuum pump ON. Evacuate the system for 5 minutes. Close V7. Turn the vacuum pump OFF. Measure and record the pressure at the MKS pressure standard.
- 9.3.16 Allow the system to remain undisturbed for 10 minutes.
NOTE: The criteria of 9.3.8 apply.
- 9.3.17 Measure and record the pressure at the MKS pressure standard. Relieve the vacuum by removing the sample port blanks.

9.4 FLOW RATE MEASUREMENT

Verifies flow monitors accurately measure air flow.

- 9.4.1 Ensure ISVS is in Operational Mode. This section is carried out at "room temperature". Measure and record ambient temperature.
- 9.4.2 Attach a calibrated MKS flow controller (channel 1) to sample port 1. Insert another calibrated MKS flow controller (channel 2) in the line between the outlet of flow monitor 1 and rotameter 1. Set the controller on channel 1 to 550 sccm. Set the controller on channel 2 to 500 sccm.
- 9.4.3 Turn the vacuum pump ON. Open V-1 and V-7. Open the control knob on rotameter 1 fully.

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- ___ 9.4.4 Allow the system flow to stabilize, then read and record the output displayed on flow monitor 1 and totalizer 1. Record the displayed flow on channels 1 and 2.
- ___ 9.4.5 Using the controller on channel 2 to control the flow, repeat the comparison at 400 sccm, 300 sccm, 200 sccm, 100 sccm and 20 sccm. The required accuracy of the system is "plus or minus 10 percent" for total volume. The advertised accuracy of the flow monitors is plus or minus two percent of full scale, or +/- 10 sccm. The reading at the totalizer shall meet plus or minus 10 percent of the measured value at channel 2 for flow settings of 100 sccm and above, while +/- 10 will be required for the 20 sccm setting.
- ___ 9.4.6 Return the system to standby mode.
- ___ 9.4.7 Attach a calibrated MKS flow controller (channel 1) to sample port 2. Insert another calibrated MKS flow controller (channel 2) in the line between the outlet of flow monitor 2 and rotameter 2. Set the controllers per 9.4.2.
- ___ 9.4.8 Turn the vacuum pump ON. Open V-2 and V-7. Open the control knob on rotameter 2 fully.
- ___ 9.4.9 Allow the system flow to stabilize, then read and record the output displayed on flow monitor 2 and totalizer 2. Record the displayed flow on channels 1 and 2.
- ___ 9.4.10 Using the controller on channel 2 to control the flow, repeat the comparison at 400 sccm, 300 sccm, 200 sccm, 100 sccm and 20 sccm. The criteria of 9.4.5 apply.
- ___ 9.4.11 Return the system to standby mode.
- ___ 9.4.12 Attach a calibrated MKS flow controller (channel 1) to sample port 3. Insert another calibrated MKS flow controller (channel 2) in the line between the outlet of flow monitor 3 and rotameter 3. Set the controllers per 9.4.2.
- ___ 9.4.13 Turn the vacuum pump ON. Open V-3 and V-7. Open the control knob on rotameter 3 fully.
- ___ 9.4.14 Allow the system flow to stabilize, then read and record the output displayed on flow monitor 3 and totalizer 3. Record the displayed flow on channels 1 and 2.

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- 9.4.15 Using the controller on channel 2 to control the flow, repeat the comparison at 400 sccm, 300 sccm, 200 sccm, 100 sccm and 20 sccm. The criteria of 9.4.5 apply.
- 9.4.16 Return the system to standby mode.
- 9.4.17 Attach a calibrated MKS flow controller (channel 1) to sample port 4. Insert another calibrated MKS flow controller (channel 2) in the line between the outlet of flow monitor 4 and rotameter 4. Set the controllers per 9.4.2.
- 9.4.18 Turn the vacuum pump ON. Open V-4 and V-7. Open the control knob on rotameter 4 fully.
- 9.4.19 Allow the system flow to stabilize, then read and record the output displayed on flow monitor 4 and totalizer 4. Record the displayed flow on channels 1 and 2.
- 9.4.20 Using the controller on channel 2 to control the flow, repeat the comparison at 400 sccm, 300 sccm, 200 sccm, 100 sccm and 20 sccm. The criteria of 9.4.5 apply.
- 9.4.21 Return the system to standby mode.

9.5 FLOW RATE MEASUREMENT AT LOW TEMPERATURE

Verifies flow monitors accurately measure air flow at low ambient temperature. Simulates ISVS operation on a cold day.

- 9.5.1 Ensure ISVS is in Operational Mode. The removable insulation sheet on the floor of the enclosure must be removed. Set the thermostat on the internal heater to minimum (0°F).
- 9.5.2 Attach a calibrated MKS flow controller (channel 1) to sample port 1. Reroute the flex tubing to place the four flow monitors in series, in numerical order. Insert another calibrated MKS flow controller (channel 2) in a temporary line between the outlet of flow monitor 4 and rotameter 1. Set the controller on channel 1 to 500 sccm. Set the controller on channel 2 to 250 sccm.
- 9.5.3 Turn the vacuum pump ON. Open V-1 and V-7. Open the control knob on rotameter 1 fully.

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- 9.5.4 Allow the system flow to stabilize, then read and record the output displayed on flow totalizers 1-4. Record the displayed flow on channels 1 and 2.
- 9.5.5 Using the fan to draw cold air into the enclosure from a cooler filled with dry ice, lower the temperature in the enclosure to the temperature calculated in 9.1.8 or lower.
- 9.5.6 While monitoring the temperature reading at T2, periodically read and record the output displayed on flow totalizers 1-4. Record the displayed flow on channels 1 and 2, and the temperature at T2. The flow reading at totalizers 1-4 shall not vary from the setpoint by more than 10%.
- 9.5.7 Return the system to standby mode, or proceed directly to section 9.6.

9.6 FLOW RATE MEASUREMENT AT ELEVATED TEMPERATURE

Verifies flow monitors accurately measure air flow at elevated ambient temperature. Simulates ISVS operation on a hot day.

- 9.6.1 Ensure ISVS is in Operational Mode or continue from section 9.5. The removable insulation sheet on the floor of the enclosure must be reinstalled. Set the thermostat on the internal heater to maximum.
- 9.6.2 If necessary, attach a calibrated MKS flow controller (channel 1) to sample port 1. Reroute the flex tubing to place the four flow monitors in series in numerical order. Insert another calibrated MKS flow controller (channel 2) in a temporary line between the outlet of flow monitor 4 and rotameter 1. Set the controller on channel 1 to 500 sccm. Set the controller on channel 2 to 250 sccm.
- 9.6.3 Turn the vacuum pump ON. Open V-1 and V-7. Open the control knob on rotameter 1 fully.
- 9.6.4 Allow the system flow to stabilize, then read and record the output displayed on flow totalizers 1-4. Record the displayed flow on channels 1 and 2.
- 9.6.5 Allow the heater to run while monitoring the temperature reading at T2. It will take some time to reach its maximum temperature. The maximum is reached when the temperature rises to 110°F or if the temperature has not risen for five minutes while the heater continues to operate.

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9.6.6 While monitoring the temperature reading at T2, periodically read and record the output displayed on flow totalizers 1-4. Record the displayed flow on channels 1 and 2 and the temperature at T2. The flow measured by flow monitors 1-4 shall not vary from the setpoint by more than ten percent.

9.6.7 Return the system to standby mode.

9.7 REVIEW

Check that steps 9.1.1 through 9.6.7 inclusive have been completed.

Test Director/Date

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10.0 DATA SHEETS

10.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE (ISVS STP)
3. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
4. Test Performed By--Print the name of the person performing the test.
5. Procedure Number--Paragraph number from the procedure.
6. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
7. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a pressure may have a value of 204 Torr, whereas a valve may have a value of OPEN, CLOSED, or OPERATES CORRECTLY, as appropriate.
8. Range--This column indicates the anticipated value of the item being measured.
9. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the range.
10. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

10.2 TEST EXCEPTION SHEETS

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the system test unnecessary).
2. Entire system test to be repeated after the discrepancy has been corrected.
3. System Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

10.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the System Test Procedure.

Test Log Sheets are included in Appendix C.

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

APPENDIX A: TEST DATA SHEETS

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Ambient temperature		record actual		
	T1		values shall agree within 2°C.		
	T2				
	T3				
	T4				
9.1.4	Cold cell temperature		record actual		
9.1.7	Cold cell temperature		record actual		
	maximum internal temperature		record actual		
	calculated difference		calculate and record 30°C minimum		
9.1.8	calculated lower limit		calculate and record 0°C minimum		

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.6	MKS pressure reading		record actual		
9.3.7	Gage reading	inHg Torr	agrees with 9.3.6 within 12 Torr		
9.3.9	Pressure		agrees with 9.3.6 within 12 Torr		
9.3.11	Pressure		record actual		
9.3.13	Pressure		agrees with 9.3.11 within 12 Torr		
9.3.15	Pressure		record actual		
9.3.17	Pressure		agrees with 9.3.15 within 12 Torr		

Test Witnesses:

 Test Director/Date

 Recorder/Date

 Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.4.1	ambient temperature		record actual		
9.4.4	monitor 1 totalizer 1 channel 1 channel 2		totalizer values shall agree within 10%		
9.4.5	@400 sccm monitor 1 totalizer 1 channel 2		totalizer values shall agree within 10% (10 sccm for 20 sccm setting)		
	@300 sccm monitor 1 totalizer 1 channel 2				
	@200 sccm monitor 1 totalizer 1 channel 2				
	@100 sccm monitor 1 totalizer 1 channel 2				
	@20 sccm monitor 1 totalizer 1 channel 2				

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.4.9	monitor 2 totalizer 2 channel 1 channel 2		totalizer values shall agree within 10%		
9.4.10	@400 sccm monitor 2 totalizer 2 channel 2		totalizer values shall agree within 10% (10 sccm for 20 sccm setting)		
	@300 sccm monitor 2 totalizer 2 channel 2				
	@200 sccm monitor 2 totalizer 2 channel 2				
	@100 sccm monitor 2 totalizer 2 channel 2				
	@20 sccm monitor 2 totalizer 2 channel 2				

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.4.14	monitor 3 totalizer 3 channel 1 channel 2		totalizer values shall agree within 10%		
9.4.15	@400 sccm monitor 3 totalizer 3 channel 2		totalizer values shall agree within 10% (10 sccm for 20 sccm setting)		
	@300 sccm monitor 3 totalizer 3 channel 2				
	@200 sccm monitor 3 totalizer 3 channel 2				
	@100 sccm monitor 3 totalizer 3 channel 2				
	@20 sccm monitor 3 totalizer 3 channel 2				

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.4.19	monitor 4 totalizer 4 channel 1 channel 2		totalizer values shall agree within 10%		
9.4.20	@400 sccm monitor 4 totalizer 4 channel 2		totalizer values shall agree within 10% (10 sccm for 20 sccm setting)		
	@300 sccm monitor 4 totalizer 4 channel 2				
	@200 sccm monitor 4 totalizer 4 channel 2				
	@100 sccm monitor 4 totalizer 4 channel 2				
	@20 sccm monitor 4 totalizer 4 channel 2				

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.5.4	totalizer 1 totalizer 2 totalizer 3 totalizer 4 channel 1 channel 2		values shall agree within 10%		
9.5.6	use chart on next sheet	see chart	values shall agree within 10%		

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

[illegible]

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEST DATA SHEET

Date:			ISVS NUMBER 1		
Title of Test: ISVS STP			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.6.4	totalizer 1 totalizer 2 totalizer 3 totalizer 4 channel 1 channel 2		values shall agree within 10%		
9.6.6	use chart on next sheet	see chart	values shall agree within 10%		

Test Witnesses:

Test Director/Date

Recorder/Date

Witness/Date (if available)

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

TEMP 12	CHAN. 1	CHAN. 2	TOT. 1	TOT. 2	TOT. 3	TOT. 4			
TEMP 12	CHAN. 1	CHAN. 2	TOT. 1	TOT. 2	TOT. 3	TOT. 4			
TEMP 12	CHAN. 1	CHAN. 2	TOT. 1	TOT. 2	TOT. 3	TOT. 4			

IN SITU VAPOR SAMPLING SYSTEM TEST PROCEDURE

APPENDIX B: TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

ISVS Number: 1			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	WHC QA	WHC SAFETY

OBJECTING PARTY: _____

RETEST EXECUTION: ☐ ACCEPTABLE ☐ UNACCEPTABLE

Recorder/Date _____ Test Director/Date _____

WHC Safety/Date _____

EXCEPTION DISPOSITION: ☐ RETEST APPROVED AND ACCEPTED

☐ EXCEPTION ACCEPTED AS-IS

☐ OTHER: _____

Explanation: _____

WHC Project Engineer/Date _____

WHC QA/Date _____

APPENDIX C: TEST LOG SHEET

TEST LOG

[illegible]

TEST EXECUTION SHEET

Date:

Document Number: WHC-SD-WM-ATP-132

ISVS Number: 1

TEST PERSONNEL

WHC PROJECT ENGINEER:

TEST DIRECTOR:

RECORDER:

WITNESS:

TEST EXECUTION

Test Director/Date

Recorder/Date

Witness/Date (if available)

WHC TEST APPROVAL AND ACCEPTANCE

Without
Exception

With
Exception/Resolved

With
Exception/Outstanding

Project Engineer/Date

Quality Assurance/Date

Safety/Date

DOCUMENT

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