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7. Abstract This test plan outlines a method of testing the flowmeter and characterizes the natural breathing of the 241-C-103 tank. It will show the effects 241-C-102 and 241-C-101 tanks have on this natural breathing and vapor emission.		
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REV. 0

TEST PLAN
241-C-103 NATURAL BREATHING CHARACTERISTICS
EVALUATION
USING THE ULTRA SENSITIVE FLOWMETER

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December 1994

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TEST PLAN
241-C-103 NATURAL BREATHING CHARACTERISTICS
EVALUATION USING THE ULTRA SENSITIVE FLOWMETER

1.0 INTRODUCTION

To facilitate the reduction of worker exposure to hazardous fumes and vapors, it is imperative to characterize and measure flows out of waste tanks that breathe due to atmospheric pressure changes. These measurements will lead to a better understanding of how these tanks breathe and thus will aid in better worker exposure control at lower cost.

2.0 TEST OBJECTIVE

Collect data required to plot the normal flow into and out of tank 241-C-103 (C-103) as a function of the atmospheric pressure and temperature change. Determine the effects tanks 241-C-102 (C-102) and 241-C-101 (C-101) have on this breathing rate. An effort will also be made to evaluate leakage into and out of this tank system.

3.0 TEST PROGRAM

3.1 TEST SETUP

3.1.1 Single Tank Evaluation Test

To simulate flow out of one tank, the ultra sensitive flowmeter will be connected to the exhaust side of the C-103 high-efficiency particulate air (HEPA) filter. Valves on tanks C-101 and C-102 will be closed. Air to the manual level gauge on C-102 will be set so the total flow will not exceed 2 cfm. Note: there is a single manual level gauge on C-102, C-101 and C-103. have automatic FICs, which do not use purge air.

3.1.2 Double Tank Evaluation Test

To simulate flow out of a tank system containing two tanks, the flowmeter will remain connected to the exhaust side of the C-103 HEPA filter. The valve on tank C-101 will be opened. Valve on tank C-102 will be kept closed. Air to the manual level gauge on C-102 will remain set as before (so the total flow will not exceed 2 cfm before opening the valve on C-101).

3.1.3 Triple Tank Evaluation Test

To simulate flow out of a tank system containing three tanks ganged together and three openings (one on each tank), the flowmeter will be left connected to the exhaust side of the C-103 HEPA filter. Valves on tanks C-101 and C-102 will be opened. Air to the manual FIC on C-102 will be set so the total flow will not exceed 2 cfm.

3.1.4 Leakage Evaluation Test

The flowmeter will remain connected to the exhaust side of the C-103 HEPA filter. Valves on tanks C-101 and C-102 will be closed. Air to the manual FICs will be varied in one cfm increments until the total flow is increased.

3.2 TEST INSTRUMENTATION

- 3.2.1 The primary instrument is the Westinghouse Hanford Company developed ultra sensitive vapor flowmeter with its recorder.
- 3.2.2 A thermocouple will be used to measure flowmeter inlet temperatures, and these temperatures will be recorded on the monitor's recorder.
- 3.2.3 Atmospheric pressure will be measured and recorded by the C-Farm weather station. (This portion may be changed by using a special pickup at the exhaust diffuser and a separate recorder.)
- 3.2.4 A thermocouple will be used to measure the atmospheric (ambient) temperature, and these temperatures will be recorded on the C-farm weather station recorder.

3.3 TESTING

Testing will be the monitoring of the tanks for a 14-day duration for each of the four configurations. The chart paper will be retrieved on a daily except on week ends as will be all the other supporting data, such as atmospheric conditions (wind, wind direction, pressure, laps rate the rate at which the atmospheric pressure changes, and temperature). Every 30 to 35 days, the flow monitor will be tested using the portable calibrated air source.

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This test is to evaluate the flow meter's performance, i.e. is there a change in the calibration due to some interaction with the tank's vapors.

Required minimum data:

1. Flow meter readings
 - a. Vapor flow
 - b. Vapor temperature
2. Atmospheric conditions
 - a. Pressure
 - b. Temperature
 - c. Wind conditions
 - d. General weather
Sunny, rain, overcast, etc
3. Tank temperature
4. Valve settings