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ENGINEERING DATA TRANSMITTAL

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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-OTP-177, REV 0

Document Title: Contaminated Liquid Drain System Operability Test

Release Date: 4/26/95

**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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SUPPORTING DOCUMENT

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7. Abstract

Testing of instrumentaion, controls and equipment associated with the contaminated drain storage and load out system at the Waste Sampling and Characterization Facility (WSCF).

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8. RELEASE STAMP

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Contaminated Drain Sampler
Performance Test

1.0 NARRATIVE

Liquid chemical waste generated by the Waste Sampling and Characterization Facility is to be drained to collection tanks located below the surface in a concrete vault. Buried double wall pipe carries the waste from sinks in the laboratory rooms to the tanks which will be treated as a less than 90 day storage pad. Samples from the tanks will be taken and analyzed to characterize the waste for shipment. To minimize entry into the vault, which will be a permit space, remote sampling is being installed. The tanks with their associated pump-out system were installed as part of project W-011H, but have not been put into service as the initial volume is not large enough to justify their use. A comprehensive test of the tanks, pump-out, sampling, and instrumentation is needed before putting this system into service.

2.0 SCOPE

This plan provides for starting and testing of the liquid waste storage tanks with their associated instrumentation, load-out pump, piping, and newly installed remote sampling and recirculation pipe. Instrumentation and control circuits will be proven and samples will be taken to demonstrate adequate sampling. The system will be operated under direction of the test engineer to establish a more thorough understanding of its performance under various conditions.

3.0 EQUIPMENT

A water meter capable of measuring total flow that is accurate to $\pm \frac{1}{2} \%$ will be needed so actual volumes can be compared with those indicated by the tanks and their level controls. Miscellaneous hose and pipe adapters and fittings will also be required to connect to the tank system. No other equipment will be needed except standard hand tools needed to connect the meter and hoses to the system.

4.0 PRECAUTIONS

To prevent contamination, all flow paths to the tanks have been plugged. In addition isolation valves immediately upstream of the tanks will remain closed until testing is completed and the system is ready to be commissioned. Some of the work required by this plan will require entry into the tank vault. Precautions required by section 3.1 of the Westinghouse Industrial Hygiene manual shall be implemented. Care shall be taken when working on potentially wet surfaces to avoid slipping.

This procedure is intended to provide a method that will test the basic features of the tank sampling and load out system. Concurrent with this test it is desirable to further explore selected features of the sampler. This testing will be done in section 10. after the basic sampler test has been completed. It will be done at the discretion of the test engineer who will provide direction at that time. The test

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engineer will provide a narrative statement that will be appended to the completed test record to document his findings.

5.0 PREREQUISITES

Before starting this work verify that the tanks are empty and clean. Confirm that valves CD-V-6-CLW and CD-V-8-CLW are closed. Verify that power is available to all instrumentation and control panels. Prior to entering the tank vault assure that access requirements are fulfilled.

6.0 INITIAL FILLING

The following steps are designed to fill tank CD-TK-W1-CLW and provide a baseline for assessment of its level indicator. The tank will be partially filled with water and an initial calibration performed. The tank will then be pumped out to establish the baseline indication for an "empty" tank. For the purposes of future waste transfer operations the tank is considered "empty" when only liquid which cannot be pumped from the tank due to geometric constraints remains. The tank will then be filled with 900 gallons of metered water so that tank level readings can be compared with a known quantity.

- 6.1 Remove shower head from safety shower and connect fill line to valve CD-V-21-CLW.
- 6.2 Align system in accordance with the table 6.1.

Table 6.1

Valve Number	Position
CD-V-21-CLW	OPEN
CD-V-2-CLW	CLOSED
CD-V-3-CLW	CLOSED
CD-V-10-CLW	OPEN
CD-V-11-CLW	OPEN
CD-V-13-CLW	OPEN
CD-V-14-CLW	CLOSED
CD-V-16-CLW	CLOSED
CD-V-1-CLW	OPEN
CD-MOV-1-CLW	CLOSED
CD-MOV-2-CLW	CLOSED

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- 6.3 Connect hose to valve CD-V-1-CLW to run pump discharge out to area behind building.
- 6.4 Put approximately 100 gallons into tank CD-TK-W1-CLW.
- 6.5 Calibrate level indicator CD-LT-W1-CLW in accordance with CBRS loop CD004 sequence 1.
- 6.6 Move the control switch HS-CD1 for CD-MOV-1-CLW to the open position and verify that it opens.

_____ Date _____

<p>Caution: Interlocks that protect the transfer pump have not been proven. the pump must be monitored during this procedure to make sure it does not continue to operate after the tank is empty. The pump could be damaged if it is allowed to run dry.</p>

- 6.7 Verify/position switch XFR PMP CD-P1 to MNL (manual) position.
- 6.8 Press start button HS-CD-P1A START and verify that pump CD-P-1-CLW starts.

_____ Date _____

- 6.9 Monitor pump and tank and verify that the pump stops when tank is empty.

_____ Date _____

- 6.10 Press stop button HS-CD-P1A STOP and verify that pump CD-P-1-CLW is stopped.

_____ Date _____

- 6.11 Record water meter serial number and calibration date.

- 6.12 Record reading on fill line meter.

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6.13 Fill the tank in 100 gallon increments and record data as shown in the table 6.2 and 6.3 below. Record the levels indicated on the level instruments where low and high level alarms change state.

Table 6.2
Recorded Tank Volume

Tank Volume	Meter Reading (on fill line)	Tank Graduation Reading	CD-LI-WI-CLW Reading
100 gal			
200 gal			
300 gal			
400 gal			
500 gal			
600 gal			
700 gal			
800 gal			
900 gal			

Table 6.3
Recorded Alarm Levels

Alarm	Meter Reading	CD-LI-WI-CLW Reading
Low Low		
Low		
High		
High High		

6.14 Isolate the safety shower and remove the tank fill hose and meter.

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7.0 TANK TRANSFER

This section provides for transferring liquid from tank CD-TK-W1-CLW to tank CD-TK-N1-CLW through the sampling system. The time required for this transfer will be used for developing sample mixing methodology.

- 7.1 Verify/open the valves CD-V-14-CLW, CD-V-XX-CLW and CD-V-XX-CLW.
- 7.2 Verify/close valve CD-V-SS-CLW.
- 7.3 Press start button HS-CD-P1A START and verify that pump CD-P-1-CLW starts. Record the time that the pump was started.

_____ Date _____
_____ AM/PM _____

- 7.4 Monitor pump and tank and verify that the pump stops when tank is empty. Record the time the tank emptied.

_____ Date _____
_____ AM/PM _____

- 7.5 Press stop button HS-CD-P1A STOP and verify that pump CD-P-1-CLW is stopped.

_____ Date _____

8.0 TANK N1 LEVEL INDICATOR

In this section water will be incrementally transferred from tank CD-TK-N1-CLW to CD-TK-W1-CLW and tank level will be compared with measured quantities.

- 8.1 Install meter and jumper assembly between valves CD-V-01-CLW and CD-V-21-CLW and record meter reading.

_____ gal

- 8.2 Verify/open valves CD-V-12-CLW and CD-V-13-CLW.
- 8.3 Close valve CD-V-14-CLW.
- 8.4 Press start button HS-CD-P1A START and verify that pump CD-P-1-CLW starts.

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Date _____

- 8.5 Pump approximately 100 gallons into tank CD-TK-W1-CLW and record the meter reading and tank CD-TK-N1-CLW level as indicated on the tank graduations and CD-LI-N1-CLW.
- 8.6 Calibrate level indicator CD-LT-N1-CLW in accordance with CBRS loop CD003 sequence 1.
- 8.7 Pump water from tank CD-TK-N1-CLW in 100 gallon increments and record data as shown in tables 8.1 and 8.2 below. Record the levels indicated on the level instruments where low and high level alarms change state.

Table 8.1
Recorded Tank Volume

Tank Volume	Meter Reading (on fill line)	Tank Graduation Reading CD-TK-N1-CLW	CD-LI-N1-CLW Reading
800 gal			
700 gal			
600 gal			
500 gal			
400 gal			
300 gal			
200 gal			
100 gal			
empty			

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Table 8.2
Recorded Alarm Levels

Alarm	Meter Reading	CD-LI-NI-CLW Reading
Low Low		
Low		
High		
High High		

8.8 Verify that pump CD-P-1-CLW stops when tank is empty.

_____ Date _____

8.9 Press stop button HS-CD-PIA STOP and verify that pump CD-P-1-CLW is stopped.

9.0 CONTROL CHECK OUT

This section will document that valve and pump controls function as designed. The system is designed so that both motor operated valves cannot be open at the same time.

9.1 Verify/open CD-MOV-2-CLW.

9.2 Move the control switch HS-CD1 for CD-MOV-1-CLW to the OPEN position and verify that the valve remains closed.

_____ Date _____

9.3 Move the control switch HS-CD1 for CD-MOV-1-CLW to the CLOSED position.

9.2 Move the control switch HS-CD2 for CD-MOV-2-CLW to the CLOSED position and verify that the valve closes.

_____ Date _____

9.2 Move the control switch HS-CD1 for CD-MOV-1-CLW to the OPEN position and verify that the valve opens.

_____ Date _____

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- 9.2 Move the control switch HS-CD2 for CD-MOV-2-CLW to the OPEN position and verify that the valve remains closed.

_____ Date _____

10.0 SAMPLER TEST

In this section the stationary priority sampler will be tested. Water will be drawn from the tanks into a sample container using the test cycle.

- 10.1 Verify/open the valves CD-V-14-CLW, and CD-V-XX-CLW.
- 10.2 Verify/closed valve CD-V-XX-CLW.
- 10.3 Move the control switch HS-CD1 for CD-MOV-1-CLW to the OPEN position and verify that it opens.
- 10.4 Move the control switch HS-CD2 for CD-MOV-2-CLW to the CLOSED position and verify that it closes.
- 10.5 Verify power is supplied to the sampler.
- 10.6 Position a 5 liter carboy under sampler and run sampler discharge into the carboy.
- 10.7 Position the main power switch to the "ON" position.
- 10.8 Press start button HS-CD-P1A START and verify that pump CD-P-1-CLW starts.
- 10.9 Press the "TEST CYCLE" on the keypad to initiate the test cycle.
- 10.10 Verify sampler purge, chamber fill and transfer to sample bottle.

_____ Date _____

- 10.11 Press stop button HS-CD-P1A STOP and verify that pump CD-P-1-CLW stops.
- 10.12 Perform unstructured testing as directed by the test engineer.

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11.0 TANK LOAD OUT

In this section the system will be emptied, the tank pump out cycle time will be recorded and water will be disposed.

11.1 Remove jumper from valve CD-V-21-CLW.

11.2 Install the meter and a hose section on to valve CD-V-1-CLW that will discharge into the area west of building 6266A.

11.3 Move the control switch HS-CD2 for CD-MOV-2-CLW to the open position and verify that it opens.

11.4 Move the control switch HS-CD1 for CD-MOV-1-CLW to the closed position and verify that it closes.

11.5 Press start button HS-CD-P1A START and verify that pump CD-P-1-CLW starts. Record the time that the pump is started.

_____ Date _____

_____ AM/PM

11.6 Record the time that the tank becomes empty.

_____ AM/PM

11.7 Verify that pump CD-P-1-CLW stops when tank is empty.

_____ Date _____

11.8 Press stop button HS-CD-P1A STOP and verify that pump CD-P-1-CLW is stopped.

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Test Exceptions