35 Station 21

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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AND PACKAGING SYSTEM

Release Date: 3/17/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Chris Willingham
C. Willingham

3/17/95

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3. Number

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6. Author

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Signature

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7. Abstract

This document provides the feature test results for the Small Debris Collection and Packaging System.

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35 Station 21

ABSTRACT

Feature testing of the Small Debris Collection and Packaging System (SDCPS) was performed for the following reasons:

- *To assess the feasibility of using "drop-out" vessels to collect small debris (<2.5 cm) in MK-II fuel canisters while transferring sludge to the Weasel Pit.*
- *To evaluate system performance under conditions similar to those in the K-Basins (e.g., submerged under 4.9 meters of water and operated with long handled tools) while using a surrogate sludge mixed with debris.*
- *To determine if canister weight could be used to predict the volume of sludge and/or debris contained within the canisters during system operation.*

Using the Wilden¹ pump with the SDCPS, a variety of small debris was captured in the canisters; however, the majority of material captured by the canisters was sludge.

Using the Tri-Nuc² pump with the SDCPS, the test was aborted after approximately thirty seconds of sludge pumping because the increased vacuum introduced when the suction hose plugged caused the "drop-out" vessel to collapse.

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MASTER

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¹The Wilden pump is a registered trademark of the Wilden Pump & Engineering Company, Colton, California.

²The Tri-Nuc pump is a registered trademark of the TRI Nuclear Corporation, Baslston, New York.

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**FEATURE TEST REPORT
FOR
THE SMALL DEBRIS COLLECTION AND PACKAGING SYSTEM**

1.0 INTRODUCTION

The Spent Nuclear Fuel Equipment Engineering group performed feature testing of the Small Debris Collection and Packaging System (SDCPS) in the 305 Cold Test Facility from January 30, 1995, to February 1, 1995. Feature testing of the Small Debris Collection and Packaging System (SDCPS) was performed for the following reasons:

- To assess the feasibility of using "drop-out" vessels to collect small debris (<2.5 cm) in MK-II fuel canisters while transferring sludge to the Weasel Pit.
- To evaluate system performance under conditions similar to those in the K-Basins (e.g., submerged under 4.9 meters of water and operated with long handled tools) while using a surrogate sludge mixed with debris.
- To determine if canister weight could be used to predict the volume of sludge and/or debris contained within the canisters during system operation.

The cold testing procedure was based on WHC-SD-SNF-TP-007, *Test Plan for Sludge Retrieval and Packaging*, and WHC-SD-SNF-TC-001, *Test Procedure Forms for Sludge Retrieval and Packaging*.

2.0 DESCRIPTION OF TEST

The test basin dimensions are 4.6 m wide x 6.0 m long x 4.6 m deep (15 ft x 18 ft x 15 ft) which contains approximately 130 m³ (30,000 gallons) of water. A surrogate sludge consisting of gravel, sand, and assorted debris was introduced into the basin water to simulate K-Basin sludge. The surrogate was contained in one 122 cm x 122 cm x 30.5 cm high (4 ft x 4 ft x 1 ft) steel box for pumping through the SDCPS into an identical box.

The SDCPS consisted of a modified 322 liter (85 gallon) stainless steel overpack drum containing two MK-II fuel canisters, a fill funnel, and a fill head. The drum and components contained within were placed on top of a submersible scale near the steel box filled with surrogate sludge. A new vacuum head (Figure 1) was tested with the system.

There was a 7.6 m (25 ft) section of 5 cm (2 in) diameter hose installed between the vacuum head and the inlet to the "drop-out" drum. A 5 m (17 ft) section of the same hose was installed between the outlet of the "drop-out" drum and the pump. Approximately 15 m (50 ft) of hose was installed as the pump discharge hose.

Figure 1. New Vacuum Head

Both the Wilden™ M-8 pump and the Tri-Nuc™ UFV-260 with filter housing and 0.3 cm ($\frac{1}{8}$ in) baskets were tested with the system. During the first test, the Wilden™ M-8 pump was suspended under water approximately 3 m (10 ft) above the basin floor. Compressed air was supplied to the pump by a mobile, diesel powered compressor. During the second test, the Tri-Nuc™ UFV-260 with filter housing and 0.3 cm ($\frac{1}{8}$ in) baskets was installed on the basin floor.

The attached test traveler: SLUDGE-WP-006, *Small Debris Collection and Packaging System Feature Test*, was used for testing. See Figure 2 for test configuration.

Figure 2. Test Setup

3.0 TEST RESULTS

3.1 SYSTEM USING WILDEN™ PUMP

The first test was performed using the Wilden™ M-8 pump with the system. While pumping water, the pump flow rate was set to approximately 208 liters/min (55 gpm). Once the desired flow rate was established, the vacuum head was lowered into the surrogate sludge. The scale indication began to increase steadily until the indicator read approximately 63.5 kg (140 pounds). At that point, suction appeared to stop. The pump was stopped (if a diversion valve had been installed, the valve would have been actuated instead of stopping the pump) and debris fell from the vacuum head.

While maintaining the vacuum head above the surrogate, the pump was restarted and allowed to pump water for approximately 20-30 seconds. The vacuum head was lowered into the surrogate sludge and once again, the scale indication began to increase steadily. When the indicator read approximately 97.5 kg (215 pounds), the reading stabilized and suction appeared to stop. The pump was again stopped.

There was no evidence of debris blocking the vacuum head. While maintaining the vacuum head above the surrogate, the pump was restarted and allowed to pump water for approximately 20-30 seconds. The vacuum head was again lowered into the surrogate sludge; however, the scale indication remained at approximately 97.5 kg (215 pounds) and the suction did not appear to resume. Time elapsed for the events described above was approximately ten minutes.

By this time, the basin was clouded by the fines present in the surrogate sludge and visibility was poor, even with the aid of an underwater camera. The pump was stopped and the vacuum head was lifted to the edge of the basin and physically checked for blockage. There was no visible evidence of blockage.

The fill head was then removed from the drum and placed in the sandbox with the J-hook still attached. Although visibility was poor, it was determined that one canister (both sides) was over full; however, the amount of debris/sludge in the other canister could not be determined.

Due to poor visibility in the basin, the J-hook could not be removed from the fill head. Testing was temporarily suspended until the basin visibility could be improved. The Tri-Nuc™ UFV-260 pump fitted with 5 μ m filters was used to clear the basin.

Once visibility improved, the J-hook was removed from the fill head and the discharge sandbox was lifted. Physical inspection revealed the presence of small amount of fine sand particles and paper. The sandbox was lowered back to its position in the basin.

The funnel was removed from the drum using a J-hook and placed on the basin floor. During removal, some of the surrogate remaining on the top of the funnel fell into canisters, some fell into the drum, and a small fraction remained in the center of the funnel.

Next, the canisters were removed from the drum. In one canister, both sections were over filled. In the other canister, one section contained approximately 41.9 cm (16.5 in) of surrogate and the other contained only about 12.1 cm (4.75 in). This uneven distribution is attributed to the fact that one canister was located directly below the fill head inlet piping while the other was offset.

The drum was removed from the basin and found to contain 2.5-5 cm (1-2 in) of surrogate. It is believed that this sludge was introduced to the drum when the funnel was removed.

The sandbox containing the remaining surrogate was removed from the basin and placed on the main floor. A plastic tarp was placed over the remaining surrogate and both canisters were emptied on the tarp. Several small pieces of debris including nuts, bolts, a washer, pieces of rubber, and pieces of paper were present in the captured surrogate sludge.

The Tri-Nuc™ UFV-260 pump fitted with 1 μ m filters was operated over night to clear the basin.

3.2 SYSTEM USING TRI-NUC™ UFV-260 PUMP

The plastic tarp was removed from the sandbox and the surrogate/debris filled sandbox was reinstalled in the basin. The drum was placed back on the underwater scale. Using a J-hook, the canisters were then installed in the drum. No problems were encountered during installation of the canisters or removal of the J-hook. Following installation of both canisters into the drum, the funnel was installed on top of the canisters using the J-hook. Some difficulties were encountered in trying to set the funnel in place. J-hook removal proceeded without incident. The position of the fill head inlet piping was rotated approximately 45 degrees in an attempt to more evenly direct the flow. Then, the fill head was easily installed on the drum.

The Halliburton flow meter, ITT Dia-Flo weir-diaphragm flow control valve, counterweight, and 0.3 cm (1/8 in) screens were installed on the Tri-Nuc™ UFV-260 pump. Since the Tri-Nuc™ UFV-260 pump had been used for basin clarification, it was selected to be tested before the Tri-Nuc™ UFV-100. The pump was lowered into the basin and the system hoses were installed.

While pumping water through the system with the control valve wide open, the flow rate was approximately 530 liters/min (140 gpm). After pumping several liters (gallons) of water through the system to remove trapped air, the vacuum head was lowered into the surrogate sludge. Initially, suction at the vacuum head was good; however, after approximately thirty seconds (265 liters/70 gallons) the suction dropped off. The pump was stopped to see if debris was caught on the vacuum head. Nothing appeared to drop off the vacuum head, so the pump was restarted above the surrogate sludge. Upon lowering the vacuum head into the surrogate sludge, the flow rate dropped rapidly. The pump was immediately stopped.

Examination of the drum via underwater camera revealed that the drum had collapsed due to the vacuum introduced. The vacuum head was raised to the edge of the basin and physically checked for blockage. There was no visible evidence of blockage in the vacuum head.

The fill head was removed and the hoses disconnected. Sediment fell out of the hose installed between the vacuum head and the fill head. It is speculated that this was caused because the flow rate or the pulp density of the surrogate sludge being pumped was too great to allow for the sludge to pass through to the collection drum; thus, blocking the inlet. Because the pump was located downstream of the blockage, it continued to pull a vacuum which caused the drum to collapse.

Since the drum was damaged, further testing was canceled and test equipment was removed from the basin.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The SDCPS functioned when used with the Wilden™ pump. Since plugging occurred in the suction hose, the Tri-Nuc™ pump should not be used the SDCPS as presently designed.

Even if the drum had included vacuum relief or had been designed to withstand the vacuum introduced, it is believed that the system probably would not have functioned; the root of the problem was the blocked suction hose or high pulp density, not the drum failure.

Although the "drop-out" vessel used in conjunction with the Wilden™ pump was successful in capturing debris, the majority of surrogate captured was sludge rather than actual debris. If capturing sludge in canisters becomes desirable in the future, it is believed that this system could be improved to provide such a function; however, the more immediate need is the capability to capture debris in canisters while allowing the sludge to pass through the pump to the Weasel Pit for staging. This system as presently designed does not meet this need.

5.0 DISPOSITION OF TEST ITEMS

Test components specific to this activity will be maintained at the 305 Cold Test Facility until further testing requirements are identified. This system is not ready for use in the K-Basin.

6.0 REFERENCES

WHC-SD-SNF-TC-001, *Test Procedure Forms for Sludge Retrieval and Packaging*, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-SNF-TP-007, *Test Plan for Sludge Retrieval and Packaging*, Westinghouse Hanford Company, Richland, Washington.

Appendix A

TEST CONTROL COPY TEST TRAVELER

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Number SLUDGE-WP-006

Job Description
Small Debris Collection and Packaging System Feature Test

Work Order No.
LL23B

Prepared by
J. G. Wagner

System Engineer Approval
S. A. Brisbin *SABrisbin* 1/23/95

Phone
6-9180

Date Required
1/30/95

Approval Designator/Safety
Class
NA/4

QA Approval
NA

Date

System Manager Approval
C. J. Alderman *CJ Alderman* 1/26/95

Phone
6-1796

30% Bldg. Manager Approval

Date
1-26-95

Safety Approval
NA

Date

Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamped	Date	Notes
1.0	Pre-Operational Checkout		Q NA T <i>D. G. K.</i> N NA E <i>SAB</i> C NA	1-31-95 1-31-95	
1.1	Verify all test performer blanks in Section 7.0 and Appendixes A, B, C, and D are completed. Also stamp "TEST CONTROL COPY" per Section 3.4 on entire procedure.		Q NA T <i>D. G. K.</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	
1.2	Conduct a "pre-job briefing" of operations, including a review of all procedures, drawings and other engineering documents required to complete the test. Signoff Appendix G.		Q NA T <i>D. G. K.</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	
2.0	Calibration Checks: Verify that all instruments have vendor calibration data or current calibration stickers.		Q NA T <i>D. G. K.</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	List Instrument Number(s) Vendor data for scale + flow meter.
3.0	Verify the equipment list (Section 4.1).		Q NA T <i>D. G. K.</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	

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TEST TRAJECTORY CONTROL COPY (Continuation Sheet)		Page 2 of 9	Number SLUDGE-WP-006		
Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamp	Date	Notes
4.0	Complete the system and verify the test layout/schematic (Figure 1).		Q NA T <i>OK</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	
4.1	Install travel markers on the overhead crane. Markers shall be placed at hook elevation 5'-6" above top of grating.		Q NA T N NA E C NA		NOT PERFORMED delete SAB 1-30-95
4.2	Install the scale. Record the reading without any weight. Tare the scale, if required.		Q NA T <i>OK</i> N NA E <i>SAB</i> C NA	1-30-95 1-30-95	Scale Reading: 16# TARE TO 0# WEIGHED BUCKET $\frac{1}{2}$ LEAD BRICK 15# ON SCALE IN BREAK RM. 14# ON SCALE
4.3	Install the following on the scale: 1. Course Fraction Collection Vessel, 2. Two (2) Mk-II Canisters 3. Canister Fill Funnel Assembly 4. Modified Fill Head Assembly 5. Vac Head/Vessel Hose (25' min) 6. Vessel/Pump Hose (10' min)		Q NA T <i>OK</i> N NA E <i>SAB</i> C NA	1-31-95 1-31-95	Vac Head/Vessel Hose Length: 25' Vessel/Pump Hose Length: 17'
4.4	Record weight of the equipment listed in 4.3, then tare scale.		Q NA T <i>OK</i> N NA E <i>SAB</i> C NA	1-31-95 1-31-95	Scale Reading: 255#
5.0	Install the Wilden M-8 Pump and 100 feet of discharge hose. <i>~50</i> <i>SAB</i> <i>1-30-95</i>		Q NA T <i>OK</i> N NA E <i>SAB</i> C NA	1-31-95 1-31-95	

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TEST TRAVELER (Continuation Sheet)			Page 3 of 9	Number SLUDGE-WP-006	
Operation Number	Test Instruction	Add / No BS Ref. Dwg., Prop., Spec.	Completion Sig/Stamps	Date	Notes
5.1	Run the pump and adjust the flow rate to approximately 50 gpm per collection vessel and note air supply pressure.		Q NA T <u>OCY</u> N NA E <u>LAB</u> C NA	1-31-95 1-31-95	Flow rate: 55 gpm (0.725 gallons/stroke) 19 strokes/15 sec Air Pressure: 65 psi
5.2	Operate the system and collect/transfer sludge until the scale reads visually inspect approximately 400 pounds. Record the weight and remove the fill head. Record the height of sludge in each section of the two (2) Mk-II Canisters. Empty and reinstall the two canisters. Calculate the apparent sludge density. Note any debris collected.	Stopped at ~215 # poor suction Opened lid 2 cans were over full. This was because of position of inlet tube.	Q NA T <u>OCY</u> N NA E <u>LAB</u> C NA	1-31-95 1-31-95	Actual Weight: 215 # Height of Sludge: full Height of Sludge: full Height of Sludge: 16.5" Height of Sludge: 4.75" Sludge Volume: 3682 in ³ Apparent Sludge Density: .05 #/in ³ ~ 82.9 #/ft ³
5.3 Optional	Repeat Step 5.2 with a different target weight. Record the height of sludge in each section of the two (2) Mk-II Canisters. Empty and reinstall the two canisters. Note any debris collected.	Did not perform	Q NA T NA N NA E <u>LAB</u> C NA	1-31-95	Target Weight: Actual Weight: Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Sludge Volume: Apparent Sludge Density:
<p style="text-align: center;">NOTE</p> <p style="text-align: center;">STEP 5.2 MAY BE REPEATED SEVERAL TIMES.</p>					

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TEST TRAVELER

(Continuation Sheet)

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Number

SLUDGE-WP-006

Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamps	Date	Notes
5.4 Optional	After target weight has been optimized repeat Step 5.2 with a different flow rate per collection vessel. Record the height of sludge in each section of the two (2) Mk-II Canisters. Empty and reinstall the two canisters. Note any debris collected.		Q NA T NA N NA E <i>MB</i> C NA	Not <i>Done</i> 1-31-95	Flow rate: (0.725 gallons/stroke) Target Weight: Actual Weight: Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Sludge Volume: Apparent Sludge Density:
NOTE STEP 5.4 MAY BE REPEATED SEVERAL TIMES.					
5.5	Empty the two (2) Mk-II Canisters and the collection vessel, if required. Note any sludge build up, or debris collected, in the container. Remove the Wilden Pump and reinstall the canisters and sludge collection equipment.		Q NA T <i>OK</i> N NA E <i>MB</i> C NA	2-1-95 2-1-95	Note approximate volume (or mass) of sludge in the collection vessel. 15" deep 796 in ³
6.0	Install the UFV-100 ²⁶⁰ Tri-Nuc pump (100 ²⁶⁰ gpm) assembly as per attached Assembly and Operating Instructions.		Q NA T <i>OK</i> N NA E <i>MB</i> C NA	2-1-95 2-1-95	
6.1	Install 100 ²⁶⁰ feet of discharge hose, the diffuser, the Halliburton Flow Meter and the Flow Control Valve on one of the pump discharge connections, cap the other connection with the counterweight. Install the 1/8" diameter screens.		Q NA T <i>OK</i> N NA E <i>MB</i> C NA	2-1-95 2-1-95	

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TEST TRAVELER (Continuation Sheet)			Page 5 of 9	Number SLUDGE-WP-006	
Operation Number	Test Instruction	Add'l Comments Ref., Dwg., Proc., Spec.	Completion Sig/Stamps	Date	Notes
6.2	Connect the pumping system to the collection vessel.		Q NA T <u>OK</u> N NA E <u>OK</u> C NA	2-1-95 2-1-95	
7.0	Check for proper pump rotation per Section 3.7 of the Tri Nuclear Corporation Assembly and Operating Instructions. (Not required if flow rate is >110 gpm)		Q NA T NA N NA E <u>OK</u> C NA	2-1-95	Flow rate _____ gpm Not Performed - used 260 gpm pump already in service
7.1	Run the pump and adjust to the desired flow rate based upon above testing.		Q NA T <u>OK</u> N NA E <u>OK</u> C NA	2-1-95 2-1-95	Flow rate: 140 gpm Valve is wide open
7.2	Operate the system and collect/transfer sludge until the target weight has been collected. Record the weight and remove the fill head. Record the height of sludge in each section of the two (2) Mk-II Canisters. Calculate the apparent sludge density. Note any debris collected.	Pan System for ~30sec (60gal). Lost suction. Stopped pump. Restarted pump w/suction head above sludge in clear H ₂ O. Flow rate dropped. Stopped pump - drum had collapsed. Found sediment	Q NA T <u>OK</u> N NA E <u>OK</u> C NA → between the fill head + suction head.	2-1-95 2-1-95	Target Weight: 220# Actual Weight: 35# Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:
7.3 Optional	Repeat Step 7.2 with a different target weight.		Q NA T NA N NA E <u>OK</u> C NA	2-1-95	Target Weight: Actual Weight: Height of Sludge: Not Performed Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:

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TEST TRAVELER (Continuation Sheet)		Page	Number		
		6 of 9	SLUDGE-WP-006		
Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamps	Date	Notes
NOTE					
STEP 7.2 MAY BE REPEATED SEVERAL TIMES.					
7.4 Optional	After target weight has been optimized repeat Step 7.2 with a different flow rate per collection vessel. Record the height of sludge in each section of the two (2) Mk-II Canisters. Empty and reinstall the two canisters. Note any debris collected.		Q NA T NA N NA E <u>SAB</u> C NA	2-1-95	Flow rate: Target Weight: Actual Weight: <i>Not Performed</i> Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:
NOTE					
STEP 7.4 MAY BE REPEATED SEVERAL TIMES.					
7.5	Empty the two (2) Mk-II Canisters and the collection vessel, if required. Note any approximate sludge build up in the container. Remove the UFV-100 and reinstall the canisters and sludge collection equipment.		Q NA T N NA E C NA		Note approximate volume (or mass) of sludge in the collection vessel.
8.0	Install the UFV-260 Tri-Nuc pump (260 gpm) assembly as per attached Assembly and Operating Instructions.		Q NA T N NA E C NA		
8.1	Install 100 feet of discharge hose, the diffuser, the Halliburton Flow Meter and the Flow Control Valve on one of the pump discharge connections, cap the other connection with the counterweight. Install the 1/8" diameter screens.		Q NA T N NA E C NA		<i>Canceled SAB 2-1-95</i>

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TEST TRAVELER (Continuation Sheet)		Page 7 of 9	Number SLUDGE-WP-006		
Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamp	Date	Notes
8.2	Connect the equipment to the collection vessel.		Q NA T N NA E C NA		
9.0	Check for proper pump rotation per Section 3.7 of the Tri Nuclear Corporation Assembly and Operating Instructions. (Not required if flow rate is >200 gpm)		Q NA T N NA E C NA		Flow rate _____ gpm
9.1	Run the pump and adjust to the desired flow rate based upon above testing.		Q NA T N NA E C NA		Flow rate:
9.2	Operate the system and collect/transfer sludge until the target weight has been collected. Record the weight and remove the fill head. Record the height of sludge in each section of the two (2) Mk-II Canisters. Calculate the apparent sludge density. Note any debris collected.		Q NA T N NA E C NA		Target Weight: Actual Weight: Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:
9.3 Optional	Repeat Step 9.2 with a different a different target weight.		Q NA T N NA E C NA		Target Weight: Actual Weight: Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:

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A7.

TEST TRAVELER (Continuation Sheet)			Page 8 of 9	Number SLUDGE-WP-006	
Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion Sig/Stamp	Date	Notes
NOTE					
STEP 9.2 MAY BE REPEATED SEVERAL TIMES.					
9.4 Optional	After target weight has been optimized repeat Step 9.2 with a different flow rate per collection vessel. Record the height of sludge in each section of the two (2) Mk-II Canisters. Empty and reinstall the two canisters. Note any debris collected.		Q NA T N NA E C NA		Flow rate: Target Weight: Actual Weight: Height of Sludge: Height of Sludge: Height of Sludge: Height of Sludge: Volume of Sludge: Apparent Sludge Density:
NOTE					
STEP 9.4 MAY BE REPEATED SEVERAL TIMES.					
9.5	Empty the two (2) Mk-II Canisters and the collection vessel, if required. Note any approximate sludge build up in the container. Remove the UFV-260 and reinstall the canisters and sludge collection equipment.		Q NA T N NA E C NA		Note approximate volume (or mass) of sludge in the collection vessel.
NOTES					
ADDITIONAL COMBINATIONS OF PUMPS, FLOW RATES, AND FILL WEIGHTS MAY BE TESTED AT THE DISCRETION OF THE TEST ENGINEER.					
THE TEST ENGINEER WILL RECORD THE APPROPRIATE DATA DURING ALL ADDITIONAL TESTS.					
10.0	Run the pump to flush any surrogate sludge from the system.		Q NA T CCZ N NA E SUB C NA	2-1-95 2-1-95	Flow rate <u> </u> gpm <u>SUB</u> 2-1-95 Ran pump for ~ 30 seconds flow rate continued to drop disassembled system.

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TEST TRAVELER (Continuation Sheet)			Page	Number	
			9 of 9	SLUDGE-WP-006	
Operation Number	Test Instruction	Ref., Dwg., Proc., Spec.	Completion - Sig/Stamps	Date	Notes
11.0	Verify that all steps in this traveler have been completed.		Q NA T <u>DCJ</u> N NA E <u>MB</u> C NA	2/01/95 2-1-95	

E = Engineer

Q = QC Inspector

T = Technician

C = Craft

N = NDE Inspector

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