

# West Valley Demonstration Project

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## TEST REQUEST

SLUDGE WASH CEMENT-WASTE CORES WINDOWS OF COMPOSITION

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RECORD OF REVISION

PROCEDURE

If there are changes to the procedure, the revision number increases by one. These changes are indicated in the left margin of the body by an arrow (>) at the beginning of the paragraph that contains a change.

Example:

> The arrow in the margin indicates a change.

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue	All	05/04/92

RECORD OF REVISION (CONTINUATION SHEET)

Rev. No.	Description of Changes	Revision on Page(s)	Dated
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WVNS-TRQ-051  
Rev. 0  
SLUDGE WASH CEMENT-WASTE CORES  
WINDOWS OF COMPOSITION

1.0 INTRODUCTION

- 1.1 The scope of this work is to coordinate the production and testing of cores from CSS drums made using actual decontaminated sludge wash solution.
- 1.2 This test request defines work that is part of the overall cement waste form qualification work identified in WVNS-TPL-70-12.
- 1.3 The work contained in this document shall be coordinated by Operations Technical Support (OTS), drawing upon other organizations as needed.
- 1.4 Test Procedure WVNS-TP-051, providing instructions for meeting the requests specified in this Test Request, shall be issued by the Cognizant OTS Engineer per EP-11-003.
- 1.5 Initial test summaries transmitting records of this test series shall be issued by the Cognizant OTS Engineer and Cognizant Quality Engineer within 15 working days of completion of major test phases. The initial summaries shall be completed in accordance with EP-11-003.
- 1.6 Test Summary Report WVNS-TSR-051, documenting the results of this testing, shall be issued by the Cognizant Test Request Engineer per EP-11-003.
- 1.7 Two prerequisites are needed before implementing this test:
  - 1.7.1 To provide a factor of safety for potential plant operating conditions, the sulfate content of actual decontaminated sludge wash solution will be increased 25% by adding sodium sulfate to the LLW batch.
  - 1.7.2 The LLW batch selected for use in this test series shall be pre-classified as capable of making Class A cement-waste. If cores from some of the drums fail the immersion test (section 2.3), the Class A rating will still allow them to be readily disposed.

2.0 OBJECTIVES

For each of the CSS recipes (Table 1), coordinate the production, curing, and testing of cement-waste to provide the following information:

- 2.1 Gel time, free liquid, and compressive strength after a 24-hour cure for two 2" x 2" x 2" cubes prepared in the laboratory from the same LLW batch. Similar measurements were required by the supernatant cement-waste Process Control Plan WVNS-PCP-001.
- 2.2 Compressive strength of cores after curing for at least 28 days per the guidelines of Appendix A in the NRC Technical Position paper (Reference 6.2).
- 2.3 Compressive strength after 90 days of immersion in synthetic sea water per the guidelines of Appendix A in the NRC Technical Position paper (Reference 6.2). Photograph the cores during the immersion at a frequency of about once a month.
- 2.4 Compressive strength after thirty temperature cycles between 60°C and -40°C per the guidelines of Appendix A in the NRC Technical Position paper (Reference 6.2).
- 2.5 Homogeneity (as measured by compressive strength) and free water on cores taken from at least three different levels for the drum produced at the lowest water to cement ratio.
- 2.6 Leachability indices of cores in both demineralized water and synthetic sea water per the guidelines of Appendix A in the NRC Technical position paper (Reference 6.2).
- 2.7 Toxicity Characteristic Leach Procedure (TCLP) measurements for metals and listed organics on shards from compressive strength testing.

### 3.0 SAFETY

- 3.1 Industrial hygiene practices shall be as described in the WVNS Hygiene and Safety Manual, WVDP-011.
- 3.2 Radiological work will be performed in accordance with the WVDP Radiological Controls Manual, WVDP-010.

### 4.0 EQUIPMENT CONFIGURATION

All equipment shall be set up as directed in test procedure WVNS-TP-051. Supporting equipment (i.e., coring equipment, coring tester) shall be set up as detailed in their respective SOPs or work orders.

5.0 PERSONNEL QUALIFICATION

- 5.1 Supporting organizations shall have their work (i.e., coring or compression testing) performed by qualified personnel.
- 5.2 Surveillance activity shall be performed by qualified Quality Assurance personnel.

6.0 REFERENCES

- 6.1 "Cement Waste Form Qualification of Sludge Wash Liquids," WVNS-TPL-70-12
- 6.2 "Technical Position on Waste Form," Revision 1, Technical Branch of the Low Level Waste Management and Decommissioning Division of the US Nuclear Regulatory Commission, dated January, 1991.

7.0 EXPERIMENTAL AND DEVELOPMENT TEST ACCEPTANCE SHEET

The acceptance criteria is provided as Attachment A.

Table 1

Drum Production and Core Requirements

Water:Cement Ratio	TDS	No. Cores	Use	
mid	mid	9	crush(3), immerse(3), & thermal cycle(3)	
low	mid	12	crush(9) homogeneity, immerse(3)	
high	mid	6	crush(3) & immerse(3)	
mid	mid	9	immerse(3) & leachability(6)	
mid	low	6	crush(3) & immerse(3)	
mid	high	6	crush(3) & immerse(3)	
mid	mid	<u>6</u>	crush(3) & immerse (3); TCLP on shards	
		54		
W:C ratio		low 0.62	mid 0.66	high 0.70
TDS		low 20%	mid 24%	high 27%

ATTACHMENT A

EXPERIMENTAL AND DEVELOPMENT TEST ACCEPTANCE SHEET

TRQ \_\_\_\_\_  
TP \_\_\_\_\_  
Page 1 of \_\_\_\_\_

PREPARED BY:

COG TRQ ENGR: \_\_\_\_\_ / \_\_\_\_\_ QUALITY ENGINEER: \_\_\_\_\_ / \_\_\_\_\_  
\_\_\_\_\_

CRITERIA FOR ACCEPTANCE OF DATA	RESULTS/COMMENTS
<ul style="list-style-type: none"><li>1) All Test Exceptions issued have been completed and ECN issued.</li><li>2) All requested analyses have been completed.</li><li>3) All QA forms, photographs, sample logs, raw data, calculations and notebook entries shall be copied and forwarded to test requester.</li><li>4) Cognizant OTS Engineer has issued brief test summaries and record transfers to MRC within 15 working days of completion of major test phases.</li></ul>	

ACCEPTED BY:

COG TRQ ENGR: \_\_\_\_\_ / \_\_\_\_\_ QUALITY ENGINEER: \_\_\_\_\_ / \_\_\_\_\_  
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