

START

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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 196702

Proj.
ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. R. R. Lehrschall, Environmental Restoration Safety Support, H4-67, 376-6788		4. Date
	5. Project Title/No./Work Order No. Activities Involving Drilling and Sampling of Contaminated Soils (Vol.1)	6. Bldg./Sys./Fac. No. Hanford Site	7. Impact Level 2 ESQ
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-EN-SAD-016, Rev. 0, 0-A, 0-B	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	11b. Work Package No. N/A	11c. Modification Work Complete N/A _____ Cog. Engineer Signature & Date	11d. Restored to Original Condition (Temp. or Standby ECN only) N/A _____ Cog. Engineer Signature & Date
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12. Description of Change
 The standard size of the drive barrels has been changed to include drive barrels of equivalent volume.



13a. Justification (mark one) As-Found <input type="checkbox"/>	Criteria Change <input type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input checked="" type="checkbox"/>
<input type="checkbox"/>	Facilitate Const. <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

13b. Justification Details
 Changes were made to include drive barrels of equivalent volume.

14. Distribution (include name, MSIN, and no. of copies) See attached distribution sheet.	RELEASE STAMP OFFICIAL RELEASE BY WHC DATE AUG 31 1993 <i>Sta. 21</i>
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15. Design Verification Required

Yes
 No

16. Cost Impact

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CONSTRUCTION

Additional \$
Savings \$

Additional \$
Savings \$

17. Schedule Impact (days)

Improvement
Delay

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	<input type="checkbox"/>	Seismic/Stress Analysis	<input type="checkbox"/>	Tank Calibration Manual	<input type="checkbox"/>
Functional Design Criteria	<input type="checkbox"/>	Stress/Design Report	<input type="checkbox"/>	Health Physics Procedure	<input type="checkbox"/>
Operating Specification	<input type="checkbox"/>	Interface Control Drawing	<input type="checkbox"/>	Spares Multiple Unit Listing	<input type="checkbox"/>
Criticality Specification	<input type="checkbox"/>	Calibration Procedure	<input type="checkbox"/>	Test Procedures/Specification	<input type="checkbox"/>
Conceptual Design Report	<input type="checkbox"/>	Installation Procedure	<input type="checkbox"/>	Component Index	<input type="checkbox"/>
Equipment Spec.	<input type="checkbox"/>	Maintenance Procedure	<input type="checkbox"/>	ASME Coded Item	<input type="checkbox"/>
Const. Spec.	<input type="checkbox"/>	Engineering Procedure	<input type="checkbox"/>	Human Factor Consideration	<input type="checkbox"/>
Procurement Spec.	<input type="checkbox"/>	Operating Instruction	<input type="checkbox"/>	Computer Software	<input type="checkbox"/>
Vendor Information	<input type="checkbox"/>	Operating Procedure	<input type="checkbox"/>	Electric Circuit Schedule	<input type="checkbox"/>
OM Manual	<input type="checkbox"/>	Operational Safety Requirement	<input type="checkbox"/>	ICRS Procedure	<input type="checkbox"/>
FSAR/SAR	<input type="checkbox"/>	IEFD Drawing	<input type="checkbox"/>	Process Control Manual/Plan	<input type="checkbox"/>
Safety Equipment List	<input type="checkbox"/>	Cell Arrangement Drawing	<input type="checkbox"/>	Process Flow Chart	<input type="checkbox"/>
Radiation Work Permit	<input type="checkbox"/>	Essential Material Specification	<input type="checkbox"/>	Purchase Requisition	<input type="checkbox"/>
Environmental Impact Statement	<input type="checkbox"/>	Fac. Proc. Samp. Schedule	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Report	<input type="checkbox"/>	Inspection Plan	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Permit	<input type="checkbox"/>	Inventory Adjustment Request	<input type="checkbox"/>		<input type="checkbox"/>

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision Document Number/Revision Document Number/Revision

WHC-SD-EN-SAD-016, Vol. 1,
Rev. 0, 0-A, 0-B

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog Engineer M. J. Galgoul	8/1/93	PE	_____
Cog. Mgr. R. A. Carlson	8/1/93	QA	_____
QA T. L. Bennington	8/23/93	Safety	_____
Safety K. A. Smith	8/23/93	Design	_____
Security N/A		Environ.	_____
Environ. K. A. Gano	8/19/93	Other	_____
Projects/Programs N/A			_____
Tank Waste Remediation System N/A			_____
Facilities Operations N/A		DEPARTMENT OF ENERGY	
Restoration & Remediation N/A		Signature or Letter No.	
Operations & Support Services			_____
IRM N/A		ADDITIONAL	
Other ERSS N. R. Kerr	NRK		_____
RRSA J. J. Zimmer	8/24/93		_____

SUPPORTING DOCUMENT

1. Total Pages **290**

2. Title

Title: Safety Assessment for Environmental Investigations and Site Characterizations Vol. 1: Activities Involving Drilling and Sampling of Contaminated Soils

3. Number

WHC-SD-EN-SAD-016, Vol. 1

4. Rev No.

0-C

5. Key Words

Characterization Activities
Safety Assessment
Vadose Zone Soils

**APPROVED FOR
PUBLIC RELEASE.
8/31/93 N. Solis**

6. Author

Name: R. R. Lehrschall

R.R. Lehrschall
Signature

Organization/Charge Code 29550/HIBBE

7. Abstract

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10. RELEASE STAMP

OFFICIAL RELEASE
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DATE AUG 31 1993
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9. Impact Level 2 ESQ

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4.4 ASSESSMENT SUMMARY

4.4.1 Assessment of Health and Safety Hazards

The potential hazards and mechanisms available that could result in consequences to the site worker, onsite worker, and the public were evaluated and are discussed in this section.

Based upon the assumptions in the analysis, the worst case consequences to the site worker were found to be exposures to air concentrations slightly above the DAC limit for ^{90}Sr and ^{239}Pu . External exposures appear to be a greater hazard than internal exposures. Controlling internal and external exposures to radiological hazards through good radiation protection practices would assure that occupational limits are not exceeded. Controls are established in Section 5.0 providing recommendations for controlling potential airborne releases and exposures to radioactive materials.

A worst case release event involving the maximum concentrations of radionuclides in three drive barrels has shown that consequences to the onsite worker and the public individuals to be negligible (magnitudes below the lower limits for a low hazard activity). The analysis also evaluated the consequences to the onsite worker at various distances to determine the appropriate boundary for establishment of a zone of control. Based upon the conclusions, it was found that a release due to dispersing the contents of three drive barrels would result in consequences below the limits for a low hazard operation at 10 m (33 ft) from the well site. The exposures expected at 10 m (33 ft) due to an accident would be no greater than 2.88 Rem/h which is below the 5.0 Rem for the onsite worker. The controls to assure consequences to the onsite worker and the public are ALARA require survey and monitoring to limit the measured dose rates of the extracted soils in a drive barrel that will assure integrity of the assessment conclusions. These controls are discussed in Section 5.0.

The maximum inventory of soil materials yielding the highest anticipated exposures was found to be three standard 25 cm (10 in.) drive barrels (actual dimensions 22 cm [8 5/8 in.] inside dia) or drive barrels of equivalent volume. Other smaller sizes of borehole tools were assessed in this analysis to determine potential radiation exposures that may be encountered as a result of the total volumes of contaminated soils removed from the boreholes.

For site worker considerations the estimated external dose rates for the soil characterization activities are identified in Attachment E. These exposure estimates address the highest anticipated radiation exposures that will be encountered by the site worker during these activities. The principal radiation sources are based upon the different configurations of the borehole tools containing maximum volumes of soil, the glove box containing a fully loaded split-spoon sampler, soil sample bottles with maximum volumes of soil, and an evaluation of exposures (based upon different volumes) associated with a waste drum.

A field source check was made of the sample glove box using a cobalt-60 source for determining the possible radiation exposure reduction based upon 1.2 cm (1/2 in.) lead glass shielding and lead impregnated gloves. The readings appear to indicate that the lead glass provides a dose reduction factor of approximately 3 on contact through the lead glass. With the source

DISTRIBUTION SHEET

To Distribution	From R. R. Lehrschall	Page 1 of 1 Date August 19, 1993
Project Title/Work Order Safety Assessment for Environmental Investigations and Site Characterizations Volume 1: Activities Involving Drilling and Sampling of Contaminated Soils, Rev. 0-C		EDT No. ECN No. 196702

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