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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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August 18, 1992

Eric Goller  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550  
Richland, WA 99352



Dear Mr. Goller:

Re: 100-NR-1 Vadose Zone Drilling DOW (M-12)

The Washington Department of Ecology has reviewed the Description of Work for Vadose Drilling in the 100-NR-1 Operable Unit. We have several comments that need resolution.

1. Section 1, page 1

**Deficiency:** The location of the 100-UN-N-17 borehole in figure 3 may not be practical, and does not coincide with the expected depth to waste in table 1. The borehole is located on top of the berm that surrounds the tank farm. The leak being investigated occurred from a pipe running perpendicular to the berm, and buried below ground level. To drill at the specified spot, the drill rig would have to be placed on top of the berm, or the berm would have to be altered.

**Recommendation:** Explain how the borehole will be located with respect to the leak, which occurred under the berm.

2. Section 3.1.1, page 5

**Deficiency:** The action which action levels trigger is not specified. Section 3.4.1 provides that 120-N-1 (test pit), 120-N-2 (borehole), and South Pond (borehole) are sampled in the same manner; at the top, every 5 feet, and at maximum depth of 5 feet below water table. This is consistent with section 3.1.2, but inconsistent with the action levels for boreholes described in section 3.1.1.

The reference to DOE-RL 1991 does not explain the field screening. There is not section 5.1.1.5.2 in draft B of the NR-1 work plan. Text proposed for draft C is not of a citable status. The reference on page 12 presents an incorrect document number.

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**Recommendation:** Describe the action that action levels will trigger. Action levels for analytical sampling may be better placed in section 3.4. This might better be placed in section 3.4.1. Explain the basis for having action levels for some sites but not others. Explain the screening without reference to an unreleased document.

3. Section 3.1.1, page 5, second paragraph

**Deficiency:**

A) The DOW does not specify the instrument that will be used for radionuclide screening.

B) Action level is based on both radionuclides & volatiles, but the second sentence refers only to measuring background using OVM at designated location.

C) The third sentence needs clarification as to what background measurements are being taken.

**Recommendation:**

A) Specify the instrument that will be used for radionuclide screening.

B) Change the second sentence to: "Prior to initiating drilling, a one-time instrument background reading will be recorded using both an OVM & a portable scintillation detector at the background site located on Figure 4."

C) Change the third sentence to: "Instrument background for volatiles & radionuclides will be measured . . . ."

4. Section 3.1.2, page 5

**Deficiency:** There is no contingency plan for the possibility that the test pit may not be practicable. If the groundwater is 40 feet below the bottom of the pond, as indicated by table 1, then the pit will have to be 45 feet deep to reach the stated objective (5 feet below the water table).

**Recommendation:** Provide a contingency plan.

5. Section 3.2.2, page 7

**Deficiency:** No activities are stipulated in lieu of geologic sampling. Photographic logging of test pits has been conducted elsewhere.

9 2 1 2 7 5 2 1 5 1

**Recommendation:** Provide for alternative geologic logging.

6. Section 3.2.2, page 7

**Deficiency:** EII 4.3 expressly does not apply to test pits.

**Recommendation:** Clarify or remove this reference to EII 4.3. Provide a procedure for residuals management. Handling of the wet soil brought up from the top five feet of the saturated zone are of particular concern. Consider holding the saturated soils in a bulk container to retain the water.

7. Section 3.2.2, page 7

**Deficiency:** The DOW does not stipulate the procedures and standards for closure of the test pit. The August 10, 1990, version of EII 5.2 partially addressed this, but the current version of EII 5.2 does not.

**Recommendation:** The DOW must explain the following:

The test pit would be an uncased excavation under WAC 173-160-010(2)(g). USDOE must either comply with the abandonment provisions of WAC 173-160-420, or prior to digging the test pit, apply to Ecology (through the OU manager) for a variance, WAC 173-160-020(2), that ensures that abandonment meets the requirements of WAC 173-160-010(4). The variance would include the following:

The excavated material must be removed from the pit and stored in a manner that will allow its replacement in the preexisting stratigraphy. The excavated material must be replaced according to the principle of last-out/first-in.

Steps must be taken to ensure that the permeability of the replaced material is less than the permeability of the surrounding undisturbed soil column. This might be accomplished by compacting the material as it is replaced, and/or by introducing clay to the reconstructed soil column.

8. Section 3.3, page 7

**Deficiency:** Physical property analysis sampling is excluded.

**Recommendation:** Collect up to five samples for physical property analysis from the test pit. Screen the samples for the physical testing laboratory acceptance criteria. The physical property samples will be analyzed for the following parameters using ASTM methods.

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- ▶ bulk density
- ▶ particle size distribution (ASTM D422-63)
- ▶ moisture content (ASTM D2216)
- ▶ moisture retention (ASTM D2325-68 and D3152-68)
- ▶ saturated hydraulic conductivity (ASTM D2434-68)
- ▶ unsaturated hydraulic conductivity at 10% moisture content after full saturation

9. Section 3.4.1, page 8, first paragraph

**Comment:** 120-N-1 is not a borehole. Correct the reference to 120-N-1.

10. Section 4, second paragraph of section

**Deficiency:** There is no required explanation of why the sampling scientist may be unable to retrieve the required volume.

**Recommendation:** Require an explanation of why the sampling scientist is unable to retrieve the required volume.

11. Section 5, numbers 6 and 7, page 11

**Comment:** There is no table 3. Correct the reference to table 3.

12. Section 5, number 7, page 11

**Comment:** Figure 3 is not the background site. Correct the reference to figure 3.

Sincerely,



Steve Cross  
CERCLA Unit  
Nuclear and Mixed Waste Management Program

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Subject: 100-NR-1 VADOSE ZONE DRILLING DOW (M-12)

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