



0094774

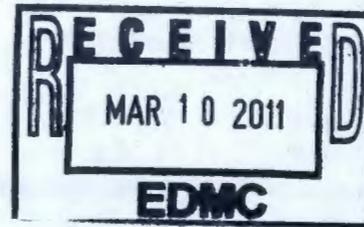
STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

3100 Port of Benton Blvd • Richland, WA 99354 • (509) 372-7950

March 3, 2011

11-NWP-008

Mr. Dennis A. Faulk, Program Manager  
United States Environmental Protection Agency  
309 Bradley Boulevard, Suite 115, MSIN: B1-46  
Richland, Washington 99352



Re: Department of Ecology (Ecology) Approval of Well Design and Installation Variance for Wells Planned for the Uranium Sequestration Pilot Test: Test Well 299-W22-98 (C8284), and Instrumentation Wells 299-W22-99 (C8285), 299-W22-100 (C8286), 299-W22-101 (C8287), and 299-W22-102 (C8288)

References: See page 3

Dear Mr. Faulk:

Ecology approves the design and installation of the test well and the instrumentation wells. The instrumentation wells will incorporate non-standard decommissioning. The design information includes multiple screens within the test well. Ecology informed the Environmental Protection Agency that some multiple screened wells may be considered a nested well as defined in Washington Administrative Code (WAC) 173-160-410(7). WAC 173-160 prohibits using nested wells as resource protection wells.

The test well and the instrumentation wells are being drilled as part of the technology development effort on uranium sequestration. The project is part of the Deep Vadose Treatability Test Plan. It is a necessary part of the remedial investigation/feasibility study being conducted to support a cleanup decision for the 200-UW-1 Operable Unit (OU). The project will include the injection of gaseous ammonia into the vadose zone to immobilize the existing uranium contamination. Ecology has reviewed the entire process and has determined that the potential impact to the environment will be negligible.

This proposed design and technology development pilot test is under authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) action. Ecology is not required to issue a variance to approve this proposal because granting a variance is an administrative requirement of WAC 173-160-406. CERCLA actions must comply with the substantive requirements of applicable or relevant and appropriate requirements (ARAR). CERCLA actions are not required to comply with administrative requirements of other laws and regulations that are ARARs.

200-UW-1



Ecology's review considered the following key features of the vadose zone in the 200-UW-1 OU and the proposed design of the wells:

- Uranium and other contaminants in the vadose zone in this area are present in varying concentrations from the top to the bottom of the vadose zone.
- Two screens are necessary in the injection well in order to treat the two areas of contamination at ~37 to ~47 feet below ground surface (bgs), and from ~189 to ~192 feet bgs in the areas of the highest contamination. The actual depth of screen placement will be determined while drilling the well.
- The distribution of uranium isotopes in the subsurface beneath the crib indicates that the mobility of these isotopes varies within the vadose zone. The highest concentration of uranium was detected at the bottom of the crib and at approximately 57 m (188 ft) bgs. These are above the caliche layer within the Cold Creek Unit.
- Uranium-238 concentrations ranged between 29 and 94 picocuries per gram (pCi/g) near the base of the U-8 crib. Beneath this zone of higher contamination and to a depth of approximately 50 m (165 ft), uranium-238 concentrations ranged between 4.3 and 19 pCi/g. The maximum concentration of uranium-238 (150 pCi/g) was detected at the caliche layer at 57 m (188 ft) bgs.
- These wells will be installed within the vadose zone and will not reach or penetrate any groundwater aquifer. The maximum depth of all of the boreholes will be 200 ft bgs. Groundwater in this area is located ~260 bgs.
- The instrumentation wells will be constructed and then decommissioned immediately upon installation of the necessary instrumentation. The instrumentation wells will consist of layers of sand around the instrument placements. The bentonite will provide the necessary seal. This arrangement is expected to be protective of the vadose zone and the environment.
- The test well will be used for several years in order to gather information for this project. The test well will be decommissioned in accordance with the standard decommissioning procedures presented in WAC 173-303 upon completion of the project.
- The wells do not connect confined and unconfined aquifers.
- This well design will be protective of groundwater and the environment.

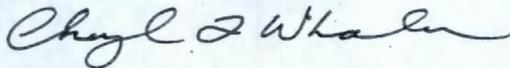
Mr. Dennis A. Faulk  
March 3, 2011  
Page 3

11-NWP-008

Ecology evaluated the risks involved in cleanup of the 200-UW-1 OU. We considered the duration of the test project and the potential risk of moving contamination from an area of higher contamination to one of lower contamination. Ecology concludes that the well designs, as documented in the references, meet WAC 173-160 requirements, and the well designs would qualify for a variance under WAC 173-160-406 if it were required. We came to this conclusion because the proposed well design provides equal or greater human health and resources protection than the minimum standards.

If there are any questions, contact Jeff Ayres at 509-372-7881.

Sincerely,



Cheryl L. Whalen  
Cleanup Section Manager  
Nuclear Waste Program

ja/aa

References:

1. *Field Test Plan for the Uranium Sequestration Pilot Test*, DOE/RL-2010-87
2. *Sampling and Analysis Plan for the Uranium Sequestration Pilot Test*, DOE/RL-2010-88

cc: Craig Cameron, EPA  
John Morse, USDOE  
Mark Benecke, CHPRC  
Chris Wright, CHPRC  
Stuart Harris, CTUIR  
Gabriel Bohnee, NPT  
Russell Jim, YN  
Susan Leckband, HAB  
Ken Niles, ODOE  
Administrative Record: 200-UW-1 Operable Unit  
Environmental Portal  
Hanford Operating Record General File