STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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August 18, 2016

16-NWP-143

Mr. Doug S. Shoop, Manager
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: A7-50
Richland, Washington 99352

Mr. John A. Ciucci, President and CEO
CH2M Hill Plateau Remediation Company
PO Box 1600, MSIN: H7-30
Richland, Washington 99352

Re: Groundwater Engineering Report and Final Status Groundwater Monitoring Plan Requirements for the Integrated Disposal Facility, Nonradioactive Dangerous Waste Landfill, Low Level Burial Grounds Trench 94, and Low Level Burial Grounds "Green Islands" Dangerous Waste Management Units

Dear Mr. Shoop and Mr. Ciucci:

The Department of Ecology (Ecology) has identified information needs regarding groundwater monitoring for the Integrated Disposal Facility (IDF), Nonradioactive Dangerous Waste Landfill (NRDWL), Low Level Burial Grounds Trench 94 (Trench 94), and Low Level Burial Grounds "Green Islands" dangerous waste management units (DWMUs). The purpose of this request is to work with the United States Department of Energy-Richland Operations Office (USDOE-RL) to develop groundwater engineering reports for each unit group.

This letter requests groundwater engineering reports for Trench 94 to be submitted to Ecology for review by October 31, 2016, and groundwater engineering reports for IDF, NRDWL, and "Green Islands" to be submitted to Ecology for review by January 2, 2017.

Both an engineering report and final status groundwater monitoring plan are required for the Trench 94 permit application for the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 8c, for the Treatment, Storage, and Disposal of Dangerous Waste* (Site-wide Permit, Rev.8c) and for the IDF, NRDWL, and "Green Islands" permit applications for the *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 9, for the Treatment, Storage, and Disposal of Dangerous Waste* (Site-wide Permit, Rev. 9). The attached enclosure identifies information necessary to satisfy Washington Administrative Code (WAC) requirements regarding groundwater monitoring for regulated units subject to groundwater monitoring, as described in WAC 173-303-806(4)(a)(xx) and 173-303-645.

Additionally, please provide schedules for completing each of the final status groundwater monitoring plans associated with the engineering reports. The schedules will be reflected in the Site-wide permit, Rev.8c permit modifications, and included in the Site-wide Permit, Rev.9 Project Schedule.

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All submittals must be signed and certified in accordance with WAC 173-303-810(12)-(13). Once the engineering reports and associated final status groundwater monitoring plans are received, they will be evaluated for completeness in accordance with WAC 173-303-840(1).

Engineering reports may identify the need for installation of new wells or replacement of wells which are not compliant with WAC 173-160. Such wells will be identified and a schedule for installation or well replacement will be developed, which is consistent with the M-24 Milestone as described in the *Hanford Federal Facility Agreement and Consent Order*.

If you have any questions, please contact me at suzanne.dahl@ecy.wa.gov or (509) 372-7892 or Dib Goswami, Groundwater Program Lead/Hydrogeologist, at dib.goswami@ecy.wa.gov or (509) 372-7902.

Sincerely,

Suzanne Dahl
Dangerous Waste Permit Manager
Nuclear Waste Program

Enclosure
sl/jvs

cc electronic w/enc:
Dave Bartus, EPA
Dennis Faulk, EPA
Michael Cline, USDOE
Michael Collins, USDOE
Stephanie Johansen, CHPRC
Jon Perry, MSA
Ken Niles, ODOE
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Dib Goswami, Ecology
Stuart Luttrell, Ecology
Ron Skinnarland, Ecology
Cheryl Whalen, Ecology
Environmental Portal
Hanford Facility Operating Record
CHPRC Correspondence Control
USDOE-RL Correspondence Control

cc w/enc:
Rod Skeen, CTUIR
Gabriel Bohnee, NPT
Alyssa Buck, Wanapum
Russell Jim, YN
Steve Hudson, HAB
Administrative Record
NWP Central File

Enclosure

Integrated Disposal Facility, Nonradioactive Dangerous Waste Landfill, Low Level Burial Grounds Trench 94, and Low Level Burial Grounds "Green Islands" Dangerous Waste Management Units (DMWU) Engineering Reports and Final Status Groundwater Monitoring Plans: Permit Application Information Needs

The permit application submittal must include detailed final status groundwater monitoring plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of Washington Administrative Code (WAC) 173-303-645 [WAC 173-303-806(4)(a)(xx)]. The engineering report should satisfy all requirements in WAC 173-303-806 and WAC 173-303-645. To assure completeness, Ecology will look for the items specified and any supporting technical basis for evaluations/background.

- A summary of the groundwater monitoring data obtained during the interim status period under 40 C.F.R. 265.90 through 265.94. This information should include changes in the groundwater monitoring network during the interim status period and why those changes were made.
- Identify the uppermost (and any other) aquifers that underlie the DWMU
- Geology and hydrogeology of the DWMU, including a geologic description of any and all aquifers identified
- Communication between uppermost aquifer and any other underlying aquifers
- The groundwater flow system; i.e., points of recharge and discharge
- Proposed groundwater point(s) of compliance
- Natural background constituents in the aquifer
- Contaminants present in the aquifer, and sources and contaminant concentrations. Alternatively, if dangerous waste constituents have not been detected in groundwater, provide sufficient information, supporting data, and analyses to establish a detection monitoring program consistent with WAC 173-303-645(9)
- Reaction products or degradation products that provide a reliable indication of the presence of dangerous constituents in the groundwater
- A description of any plume of contamination that has entered the groundwater
- A history of operations at the DWMU that may have contributed to the contamination present in the uppermost aquifer
- A history of groundwater monitoring at the DWMU and/or discharges from sources affecting the uppermost aquifer (i.e., summary of interim status groundwater monitoring data including changes in monitoring well networks)
- Changes in groundwater flow direction and rate over time
- Changing heads (water levels) over time
- Any computer simulations of groundwater flow and/or flow transport in the uppermost aquifer underlying the DWMU used to identify the location and number of wells

- Aquifer characteristics that help determine the number and location of wells (e.g., longitudinal and transverse dispersivity)
- Number and location of existing and proposed groundwater monitoring wells and the technical justification for each well
- Replacement schedule for groundwater monitoring wells which don't comply with WAC 173-160
- Existing and proposed well construction, including screen length and placement
- Any remediation activities occurring in the area around the DWMU and the effect, if any, on water table elevation and groundwater flow direction at the DWMU in question.

The current Groundwater Conceptual Agreement Package (CAP) establishes the basic information to be included in the Permit, and permit application submittal. The following information requirements constitute additional technical requirements established on a DWMU unit group basis reflecting the unique circumstances of groundwater conditions:

1. The detailed engineering report must include a complete analysis of the following topics to support the design of the groundwater monitoring well network and the monitoring program:
   a. Information necessary to support the design of the groundwater monitoring well network, such that it is capable of yielding representative samples of groundwater potentially impacted by releases from the DWMUs resulting from changes in groundwater flow direction, declining water tables, and/or degrading wells that may be causing sample or groundwater contamination.
   b. Information supporting design of the groundwater monitoring program that is capable of detecting significant increases in groundwater contamination at the earliest practicable time.
   c. Include uncertainty in groundwater flow direction so that the appropriate number of wells can be located and drilled. This includes one year of background monitoring for constituents listed in WAC 173-303-110(3)(c) and (7) and any other constituents not listed there which have caused a managed waste to be regulated under this chapter, unless previously performed to Ecology's satisfaction. Given the three year schedule for drilling and installing new wells, there should be at least two years minimum of groundwater monitoring for any new wells or revised groundwater monitoring networks.
   d. Describe the approach, input data, any additional information needs, and analysis proposed to evaluate and respond to 1(a). Submit a full report of the complete analysis supporting the proposed approaches, including the methodology and results of validation of any modelling. Modifications of the groundwater monitoring network(s) may be needed to ensure they will continue to yield representative samples of groundwater potentially impacted by releases from the DWMUs.

2. The permit application submittal must include a final status groundwater monitoring plan that includes unit-specific indicator parameters and dangerous waste constituents pursuant to WAC 173-303-645(4). Where applicable, concentration limits for those constituents should be established in accordance with WAC 173-303-645(5).