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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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November 20, 2001

Mr. Keith Klein
United States Department of Energy/Richland
P. O. Box 550, MSIN: A7-50
Richland, Washington 99352

Mr. Harry Boston
United States Department of Energy/Office of River Protection
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

Dear Messrs. Klein and Boston:

Re: Findings from groundwater compliance monitoring evaluation inspection at the T and TX/TY Waste Management Areas.

Beginning December 6, 2000 the Washington State Department of Ecology (Ecology) conducted an inspection of the groundwater monitoring system in place at the T and TX/TY Waste Management Areas. This inspection was conducted to coincide with the United States Environmental Protection Agency (EPA) guidelines for groundwater compliance monitoring evaluation (CME) inspections. Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestone M-24 requires Resource Conservation and Recovery Act (RCRA) groundwater monitoring wells be installed at land based units and single-shell tank farms.

Ecology's inspection revealed the following regulatory deficiencies and concerns (see attachments for further details):

REGULATORY DEFICIENCIES:

The current groundwater monitoring systems in place at the T and TX/TY waste management areas are insufficient to determine the extent to which these facilities may have impacted the quality of ground water in the uppermost aquifer underlying the facilities as required per 40 CFR, Subpart F, 265.90 (a). The current groundwater monitoring systems in place at the T and TX/TY waste management areas have not been installed, maintained or operated to meet the requirements of 40 CFR, Subpart F, 265.91 through 265.94 as described below:

40 CFR, Subpart F, 265.91:

- Due to lowering of groundwater levels the up-gradient RCRA groundwater monitoring well for the T tank farm waste management area (well #299-W10-16) has been rendered unusable for collection of groundwater samples per 40 CFR, Subpart F, 265.91(a)(1). Furthermore, due to changing groundwater flow direction, this well location is no longer viable for comparison of up-gradient monitoring data with down-gradient data (i.e. this well would be up-gradient only if groundwater flow were to the north or northeast).

- Due to changes in the direction of groundwater flow the groundwater monitoring well systems at the T and TX/TY waste management areas are insufficient for detecting dangerous waste constituents that may migrate from the waste management areas to the uppermost aquifer per 40 CFR, Subpart F, 265.91(a)(2).

- Current spatial configuration of the groundwater monitoring systems and groundwater monitoring data evaluation methods are inadequate to ensure the system can immediately detect any statistically significant amounts of hazardous waste constituents that may migrate from the waste management areas to the uppermost aquifer per 40 CFR, Subpart F, 265.91(a)(2).

- Modeling assumptions (i.e. input parameters) used to derive the number of groundwater wells needed, their locations and their depth have not been evaluated against waste management area specific data. Therefore, groundwater monitoring data evaluation methods are inadequate to ensure the system can immediately detect any statistically significant amounts of hazardous waste constituents that may migrate from the waste management areas to the uppermost aquifer per 40 CFR, Subpart F, 265.91(a)(2).

40 CFR, Subpart F, 265.93:

- Due to lowering of groundwater levels the up-gradient groundwater monitoring well for the T tank farm waste management area (well #299-W10-16) has been rendered unusable for collection of groundwater samples essential to evaluating the extent and sources of contamination in this waste management area per 40 CFR, Subpart F, 265.93(d)(4)(i).

- Changes in groundwater flow rate, direction and gradient in the T and TX/TY waste management areas have not been evaluated for their impact on the rate and extent of contamination in groundwater per 40 CFR, Subpart F, 265.93(d)(4)(i).

- Neither the vertical nor horizontal extent of contamination to groundwater in the T or TX/TY waste management areas have been delineated per 40 CFR, Subpart F, 265.93(d)(4)(i).

- The current groundwater monitoring systems at the T and TX/TY waste management areas are insufficient to characterize the vertical or horizontal extent of contamination or to provide adequate information to determine the constituent concentration in groundwater per 40 CFR, Subpart F, 265.93(d)(4)(i) and (ii).

40 CFR, Subpart F, 265.94:

- Annual groundwater assessment reports issued by the United States Department of Energy (USDOE) do not contain sufficient detail to meet the requirements of 40 CFR 265.94(a)(2)(ii) and the information contained in the reports for the T and TX/TY waste management areas has not been current.

In addition to the regulatory deficiencies described above, Ecology has the following concerns regarding the groundwater monitoring system at the T and TX/TY waste management areas:

CONCERNS:

- Logging from deep vadose zone sampling boreholes in the TY tank farm indicate significant vadose zone contamination from tank waste releases and that tank waste is present below geologic formations in the vadose zone previously thought to provide a barrier to downward migration of contaminants. Some vadose zone sampling boreholes in the T and TX/TY waste management areas extend very close to groundwater and indicate contamination at these depths (i.e. impact to groundwater is highly probable).

- Subsurface geology indicates hydrologic properties that may yield smaller contaminant dispersion than is currently assumed for modeling purposes. (i.e. measured hydrologic properties indicate the shape of plumes emanating from the T and TX/TY waste management areas may be more narrow than previously expected or modeled).

- Statistical baseline evaluations have been discontinued although basic groundwater parameters have changed. Monitoring records indicate that groundwater flow rate, gradient and direction have changed and that groundwater has been impacted by tank waste. Currently, up-gradient monitoring is insufficient. Upon resolution of up-gradient monitoring requirements, establishment of a new statistical baseline will be necessary.

- A number of abandoned or non-maintained wells near the T and TX/TY waste management areas may provide conduits for contamination, which could increase contaminant migration in the vicinity of the T and TX/TY waste management areas.

- One up-gradient groundwater monitoring well is in place at the TX/TY waste management area; however, this single well is insufficient to compare down-gradient contamination to up-gradient groundwater quality.

- A number of wells in the vicinity of the T and TX/TY waste management areas have not been sampled in many years and appear unused or un-maintained; however, these wells have not been decommissioned per WAC 173-160-381 (i.e. well #'s 299-W14-12, 299-W15-2H, 299-W15-4, and others). These wells may provide conduits for contamination to the vadose zone or the underlying aquifer. This in turn can increase contaminant migration near the T and TX/TY waste management areas.

- Samples taken from T and TX/TY waste management area monitoring wells were filtered through a 0.45 micron membrane; however, ion species present in groundwater may adhere to soil particles that are removed by the filtering process. Therefore, unfiltered samples should be collected when in-situ turbidity measurement goals have been reached.

Ecology will withhold enforcement against the regulatory deficiencies and concerns listed above subject to receipt of a written report to Ecology, within forty-five (45) days of the date of this letter, describing actions and schedules for satisfactory resolution of the deficiencies and concerns described above. Scheduling within the report for resolution of these actions may be coordinated with groundwater well installation agreements per Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestone M 24-00N. A request for additional time to complete the report described in this letter must be in writing, describe the reasons for the request for additional time, and be received by me for consideration no later than December 28, 2001. If you have any questions regarding this letter, please contact me at (509) 736-3031.

Sincerely,

Bob Wilson

Bob Wilson, Compliance Inspector
Nuclear Waste Program

BW:nc
Attachments: T/TX/TY CME Inspection Report
Comprehensive Groundwater Monitoring Evaluation Report

cc w/o attachments: Dave Bartus, EPA
L. John Iani, EPA
Doug Sherwood, EPA
Marvin Furman, DOE
John Morse, DOE
Mike Thompson, DOE
Arlene Tortoso, DOE
Michael C. Hughes, BHI
Michael Graham, BHI
Richard Gurske, FHI
Gene Grohs, PNNL
Lura Powell, PNNL
Phil Miller, CHG
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Jim Rasmussen, ORP
Rob Yasek, ORP
Todd Martin, HAB
Rick. Gay, CTUIR
Pat Sobotta, NPT
Russell Jim, YN
Ken Niles, OOE
Administrative Record: TWRS/Groundwater Monitoring