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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD/INL PROJECT OFFICE  
309 Bradley Boulevard, Suite 115  
Richland, Washington 99352

August 16, 2007

Mr. Matthew S. McCormick, Assistant Manager  
for the Central Plateau  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

Re: PNNL-16435, Draft Limited Field Investigation Report for Uranium Contamination in the 300 Area, 300-FF-5 Operable Unit, Hanford Site, Washington

Dear Mr. McCormick:

EPA has reviewed the subject document and is providing comments in this letter. The study has produced useful information on the geology and hydrogeology of the 300 Area. This data will help refine the conceptual model. Considering only four borings were drilled, a large volume of data was generated.

Enclosed with this letter you will find several general comments and a short list of specific comments on the Limited Field Investigation Report. Much of the content of the general comments are subjects that will be discussed during the public meeting scheduled for August 29, 2007.

EPA is pleased to continue coordination of investigations and assessments in the 300 Area. Please feel free to contact me at (509) 376-4919 regarding these comments or any other concerns about the cleanup in the Hanford 300 Area.

Sincerely,

A handwritten signature in cursive script that reads "Alicia Boyd".

Alicia Boyd  
300 Area Project Manager

Enclosure

cc: Mike Thompson, DOE  
Cheryl Whalen, Ecology  
Ken Niles, ODOE  
Russell Jim, Yakama Nation  
Stuart Harris, CTUIR  
Gabe Bohnee, NPT  
Admin. Record: 300-FF-5

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## Draft Limited Field Investigation Report for Uranium Contamination in the 300 Area, 300-FF-5 Operable Unit

### General Comments

- The LFI Report does not do an accurate job of describing other investigations in the 300 Area, either completed or ongoing. Results from the LFI raise many questions as well as providing answers. The report should acknowledge alternative investigations that will aid in answering those questions. For instance, an obvious question is: "Why weren't any boreholes drilled through a former liquid disposal site?" There is existing data from potholing performed in one of the process ponds, but that data wasn't incorporated or compared in the LFI report. Soon there will be a well drilled in the south process pond to continue the investigation into the high concentrations of TCE. This borehole will have soil samples taken and analyzed for uranium in a similar manner to the LFI, but the effort was not outlined in the report. EPA recommends writing a section on other investigations to more clearly define the *limited* scope of the LFI and the variety of additional investigations that are ongoing in the 300 Area.
- The widespread volatile organic compound (VOC) contamination detected in the LFI calls for revisiting plans for the feasibility study (FS). With these two types of contaminants present in the aquifer, thought needs to be given to how potential remedial alternatives may be compatible or incompatible. For example, polyphosphate injection to treat the uranium plume may be incompatible with potential VOC remedial alternatives such as air sparging, chemical oxidation, or soil vapor extraction. DOE will need to ensure that the remedial alternatives for uranium have a screening in the FS process to investigate potential incompatibilities with known VOC remedial technologies.

### Specific Comments

- 1) **Page 3.23, Figure 3.12:** The elevation map for the Hanford formation/Ringold Formation boundary is a good addition. It should be updated whenever any new data are collected. Generally, it is a reasonable interpretation; however, stakeholders should realize its limitation. With one-meter contours and data points some places 600 meters apart, the actual surface may vary from this. EPA recommends that this map be updated and included in subsequent documents regarding the 300 Area groundwater operable unit.
- 2) **Page 4.5, fourth paragraph concerning well 399-3-18:** There should be a discussion about the high gamma readings and high U concentrations measured in the upper Ringold Formation, as presented in Figure 3.2 (from approximately 96 meters to 100 meters elevations). These readings seem to indicate contamination is occurring at a greater depth than is discussed in the text.
- 3) **Page 4.6, first paragraph, second sentence:** This sentence is not clear and should be reworded.

- 4) **Pages 4.7, only paragraph:** The nature and extent of the main source for the uranium in the groundwater remains undefined. Far less data was collected during the LFI than had been initially planned. The data collected supports a conceptual model where uranium is somewhat evenly distributed at low concentrations in the vadose zone over a large area. However, an alternative conceptual model that assumes “hot spots” of vadose zone uranium controlling groundwater contamination has not been ruled out by this investigation. Page 4.7 describes the results as comparing very well with previous PNNL investigations (Zachara 2005). Some discussion on the results of this investigation and the comparisons with the LFI should be added to the text.
- 5) **Pages 4.7, only paragraph:** The LFI report contained no mass balance calculations to correlate actual vadose zone data with observed groundwater uranium concentrations. This section of the document should either contain information regarding such a mass balance calculation or state what future document will contain such information.
- 6) **Page 4.8, second paragraph:** This paragraph discusses the possible role of inorganic carbon as  $\text{CaCO}_3$  and co-precipitation of uranium with calcite as a control on uranium in the vadose zone. The paragraph notes that more detailed characterization would be needed to refine this part of the model. As noted in the third paragraph that follows this statement, uranium co-precipitation with calcite might have significant implications on the fate and transport of uranium (and on potential remedial options as well). A program for characterizing uranium co-precipitation with calcite should be considered.
- 7) **Page 4.11, Table 4.1:** The use of standardized well designations would be an improvement. For example, Table 4.1 uses C5000, 399-1-23; Figure 3.3 uses 399-1-23 (C5000); Figure 1.1 uses 1-23; Figure 3.12 uses 399-1-23; Figure 4.2 uses C5000 (399-1-23). It is easy to get distracted by this type of mix-and-match terminology. If standardization cannot easily be achieved, please list all well designations on maps and in tables.
- 8) **Page 4.11, Table 4.1:** Suggest adding the MCL values for each contaminant to the table.
- 9) **Page 6.35 through 6.44:** This section on the leaching tests presents some interesting data that may support the screening of remedial alternatives for the FS and the conceptual site model. Further studies should be considered.