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Theodore R. Kulongoski, Governor

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Mr. Joe R. Franco
Assistant Director for the River Corridor
U.S. Department of Energy
P.O. Box 550 MS A3-04
Richland, WA 99352

Dear Mr. Franco:

I am writing to offer several comments and suggestions for planning for the Columbia River Component (CRC) of the River Corridor Baseline Risk Assessment. Because the health of the Columbia River ecosystem is critically important to Oregon, we support an effective, comprehensive assessment of human and ecological risk in the river. In addition, because the Columbia River is the ultimate receptor and integrator of many of the contaminant plumes and releases from Hanford, a comprehensive risk assessment of the Columbia River ecosystem is necessary to insure effective cleanup of wastes in the river corridor at Hanford. We have participated and offered comment in several workshops to scope and begin planning for the CRC. As we now move from the DQO process to preparation of sampling plans, we want to share some additional recommendations for this work.

First, we compliment DOE and its contractors, Washington Closure Hanford (WCH) and Woodard and Curran (W&C), for responding to many of the concerns raised by stakeholders during recent workshops. We note that in response to comments, DOE has decided to:

1. perform a full baseline risk assessment, scrapping plans for an intermediate step of a screening level assessment;
2. add a project element to identify and characterize groundwater upwellings;
3. expand the assessment to include at least limited sampling of biota (fish) in the Columbia River; and
4. increase the number of water and sediment sampling sites in the river.

We also note and appreciate participation by you and Stacy Charboneau in the April 17 CRC workshop. Your presence for the entire workshop denotes a level of engagement by senior management that has been uncommon in the past.

We appreciate the changes noted above and are offering ideas to further enhance the CRC effort to insure reliability of assessment results. We are offering comments now, while the detailed design and sampling plan are being formulated, so that you can consider them while the Sampling and Analysis Plan is being written.

Our primary concern is that the overall study design is vague and does not help define clear or specific goals and information needs. Because the problem statement posed as Step 1 of the DQO process ("Have the Hanford-related contaminants in river media been characterized [e.g.,

nature and extent] enough to evaluate risk?") and the associated conceptual site model are generic, they do not focus or guide study design. As a result, the design presented at the April workshop lacks necessary rigor in that it:

1. does not identify specific contaminant releases that are of concern;
2. does not link putative releases to exposure pathways or to receptors;
3. does not have any explicit distribution of sample points to characterize specific contaminants, pathways or receptors; and
4. does not identify an acceptable level of uncertainty for characterizing and quantifying risk, and thus does not consider sample sizes.

Instead, the April design reflects an *ad hoc* process for selecting sample points that could be described along the lines of "We think there are fine-grained sediments in this area (e.g., below a reactor outfall) and we don't have much data for the area, so let's put a sample point about here." This kind of sample design is well-intentioned, but unlikely to succeed. Unless specific risk questions are articulated, there will not be a sample design that will allow them to be answered. Without clear questions and answers, there will not be data to support a rigorous, statistically defensible evaluation of exposure and risk, and thus no reliable guidance for cleanup decisions. We strongly encourage DOE to work with your contractors and stakeholders to develop a detailed set of problem statements and questions for each reactor area and for other sites where there are (or may have been) substantial contaminant releases to the river. Using those detailed questions, DOE can then develop a rigorous, statistically-based sample design that for each question quantifies contaminant concentrations, actual exposure, and risk for specific receptors.

Our second concern is DOE's planned approach for characterizing groundwater upwellings. As noted above, we applaud your commitment to identify and characterize upwellings that might be releasing contaminants to the Columbia River. We hope the Trident probes described at the April workshop will be effective, but we have reservations about their use. The logistics of using this tool are daunting, as the method requires one to hold a boat in place, lower the probe on a bar through flowing water, push the probe into sediments, then hold everything steady while taking *in situ* measurements of temperature and conductivity and possibly collecting a water sample. This means that in a fast flowing river like the Columbia, sampling will be difficult and slow, and the number of points that can be sampled will likely be very limited, at least compared to the number of sample points needed to "map" areas of upwelling in the river. We are also concerned about usability of the Trident probes in hard (clay or cobbly) substrate or in an armored river bottom. The probe does not appear to have been made for rugged use in hard or rocky sediments. Literature from the manufacturer instructs the user to "Reposition the Trident probe if there is any question of striking hard objects." In the Hanford reach, the most significant upwellings of groundwater will likely be in areas with coarse substrate, and the highest potential exposure of biota (e.g., fish eggs and fry) will also be in sediments dominated by coarse gravel or cobbles. This means the Trident probe will probably not be able to characterize the locations that are of highest interest for the CRC risk assessment. We would like to see DOE and its contractors evaluate alternate approaches for identifying and sampling groundwater in upwelling areas in the event the Trident probes cannot be used.

At the April workshop, one of DOE's subcontractors presented results of a pilot study to characterize sediments in the Hanford Reach and Lake Wallula. We are encouraged by the apparent success of efforts to identify presence (but not thickness) of fine sediments, and encourage continuing work to improve your capability to map sediments. One of the results of the pilot effort, however, was the finding that fine-grained sediments often don't occur where they were "expected," and vice versa. Consistent with our remarks about sampling design, we encourage you to map sediments in potential sampling areas before planning detailed sampling, to insure that planned sampling is targeted at locations where fine sediments are known to occur.

With regard to fish sampling, we believe this effort needs additional planning and a clear statement of sampling goals. We are pleased to see fish sampling added to the CRC assessment, but we do not believe the proposed approach can provide enough information to support risk assessment. The Hanford Reach is about 45 miles long, with a variety of contaminant releases from discrete and diffuse plumes, and with widely varying habitats. A sample of five fish per species is simply not adequate to represent the variability of conditions and exposure in the Reach or to support a credible estimate of risk. Within the context of refining overall study questions, we encourage DOE and its contractors to refine problem statements and conceptual models regarding potential exposure and risks for fish populations, then to determine how many fish need to be sampled, and where, to meet those specific needs.

As an additional approach for characterizing contaminant effects in the Columbia River, we encourage DOE and its contractors to include sampling of periphyton as part of the CRC. Oregon and other stakeholders proposed periphyton sampling for prior projects (100/300 Areas, Inter-Areas), but WCH rejected that recommendation. There are several benefits of this sampling for the project, including:

1. Periphyton occurs at the groundwater-river interface, so chemical analysis of periphyton can provide a relatively convenient metric for locating contaminant inputs from groundwater.
2. Contaminant concentrations in water at the groundwater-river interface change dramatically with time with changes in river stage. Unlike a grab sample of water, which quantifies contaminant concentration only at the moment of sampling, periphyton sampling provides a time-integrated measure of exposure.
3. Periphyton is the base of the food web for many riverine organisms. Thus, sampling will help define exposure and risk in a pathway that has not been well-characterized at Hanford.
4. Periphyton is sessile, so spatial patterns of contaminant exposure and uptake can be defined with better certainty than by sampling freely-moving organisms such as fish.

In sum, we believe periphyton sampling will provide both a tool for mapping upwellings of contaminated groundwater on the river bottom, and for characterizing exposure via food webs for fish and other aquatic organisms.

We remain concerned about the arbitrary boundaries that often exist between projects and risk assessments at Hanford. Presentations at the April workshop continued to show an arbitrary boundary between study areas for the CRC and the 100/300 Areas risk assessment. This was described as a "sampling boundary," but there was no explanation of how the boundary will used in actual risk assessments. Water, sediments, contaminants, fish, other aquatic organisms, and humans can all move freely across this boundary so the risk assessments must also encompass exposure on both sides of the boundary. We are also concerned about the logistical implications

managers, different WCH subcontractors, and different schedules, what happens if the CRC determines that additional samples need to be collected on the Hanford side of the boundary? We have a similar concern about the interface between the CRC and groundwater projects. Successful integration will be a challenge. DOE will need a continuing, diligent effort to blend the strengths of these two programs to insure an effective assessment of current and long-term risks in the river from groundwater releases.

As a final technical point, we urge DOE to consider the needs of natural resource injury assessment in design of the CRC. One of the reasons DOE recently decided to start injury assessment was that it offers the opportunity to coordinate efforts for risk and injury assessment, saving time and resources. We encourage DOE to work with the Hanford Natural Resource Trustee Council to seize this opportunity by ensuring sampling plans for the CRC are adequate to meet the information needs of both the risk assessment and injury assessment.

For the reasons outlined above, we encourage you to revisit and revise the schedule for the CRC. Throughout the CRC, we have noted the assumption that the major portion of field sampling will be done during the fall of 2008. For many reasons – uncertain distribution of fine-grained sediments, unknown reliability of the proposed approach for identifying groundwater upwellings, unknown extent and location of groundwater upwellings, lack of a detailed sampling design (which is dependent in part on the other uncertainties), an opportunity to coordinate efforts with injury assessment -- we encourage you to take a more cautious, methodical approach to planning and sampling. The sampling plan and schedule for the CRC need to be clearly tied to specific questions and data needs, rather than to an opportunistic sampling window. We prefer one sampling campaign, well-planned and done comprehensively, rather than sampling that is spread needlessly over multiple phases. If this delays sampling until 2009, so be it.

We all have a stake in protecting the Columbia River, so we all want an effective, credible risk assessment for the CRC. We are encouraged by the changes DOE and its contractors have already made on the CRC project, and have offered here a number of suggestions for additional project improvements. We will continue to work with DOE and contractors to develop and implement an effective assessment. Thank you for your consideration of our comments. If you have any questions or wish to discuss any of our comments, please call Paul Shaffer at 503-378-4456.

Sincerely,

Ken Niles
Assistant Director

cc: Hanford Natural Resources Trustee Council
Larry Gadbois, U.S. Environmental Protection Agency
John Price, Washington Department of Ecology