Subject: **Technical Advisory Group – Risk Subgroup – Meeting**
Date of Meeting: 1/31/2006
Location of Meeting: Cascade Room, Portland District, Portland, OR

Participants:
Corps and Consultants to Corps (URS):

Jeff Hurt	Mike Gross	Carolyn Schneider
John Wakeman	Chris Moody, URS	Heather Loso, URS

Agency/Tribal Members:

Bob Schwarz, ODEQ	Paul Seidel, ODEQ	Jennifer Peterson, ODEQ
Jeremy Buck, US FWS		

1. Following is John Wakeman's presentation of the phases of Bradford Island response, and associated decisions. ODEQ comment 31 (describe how the RI relates to the Non-Time Critical Removal Action) stimulated this classification. "R" stands for River; "U" stands for "Upland." See also Figure 1, at the end of this memo.

- R2. **Objective 1:** decide to go to NTCRA. Basis is concentration reduction and rank-order risk estimates
- R2. O**bjective 2:** collect benthic tissue data, synoptic sediment, and some water measurements to parameterize a trophic model that relates the two with adequate confidence. This will support a baseline risk assessment (R2 Baseline) that represents conditions prior to the removal, and also makes possible predictions of steady-state conditions following removal.
- R2. **Objective 3:** Distinguish site-related PCB from "background" PCB in fish tissue. (This portion of the PCB is not likely to be amenable to site-related decisions for cleanup.)
- R2. **Objective 4.** Collect water and sediment data to address construction impacts of removal action.
- R3. **Objective 5.** Collect sediment data to address nature and extent of contamination <u>above</u> levels predicted to have adverse affect by compilation during R2.
- R3. **Objective 6.** Create an R3 baseline risk assessment for ROD. (This will also address risk reduction since R2.)
- R4. **Objective 7.** Monitor construction effects from final action.
- R4. **Objective 8.** Document construction completion.
- R5. **Objective 9.** Document long-term sediment compliance; document tissue trends as result of sediment reduction.

2. Discussion of risk-related issues for the In-water EE/CA
a) Water quality measurements. <u>These are the written comments made by the identified party.</u>

- Additional surface water monitoring sampling should be conducted as part of pre-removal baseline (R2 baseline) – DEQ
- Existing SPMD data do not represent water column well due to uncertainty in the type of SPMD and method of deployment; consider data set from http://www.ecy.wa.gov/pubs/0503006.pdf – USFWS and ODEQ
- Address how protection of resources will be assured during dredge-dewatering and water return flows to the Columbia River – USFWS and ODEQ

- Characterize bioaccumulation potential from dredging exposure –ODEQ

Discussion.

Heather Loso presented her use of the TrophicTrace model to test the influence of entering a water concentration directly, or having the program calculate the result by equilibrium partitioning (EqP). (An updated version of this is included as spreadsheets.)

Jennifer Peterson said that water concentration was critical. Heather discovered that entering a measured "worst-case" total water concentration from the pre-Time Critical Removal Action actually gave a lower result than that calculated by the program. The measurements that Heather used were 7.28 ug/L total PCB, or 0.65 ug/L dissolved. Using the estimated 95% UCL on the mean of site samples (per the EE/CA),17218 ug/kg, TrophicTrace estimated a freely dissolved value of 6,500 ug/L PCB. This sounds like a great difference; however, in terms of risk, the EqP approach only returned a 2-3 times greater ILCR than the measured values did. This is not a great deal of difference in risk assessment terms. However, it could be critical in terms of defining the probable extent of contamination if we rely upon the model.

Table 1, below, shows a comparison of the Incremental LCRs calculated from the EPC for sediment associated with Alternative 1, no unknowns, weighted (17,218 ug/kg) and either site-specific or TTM estimated surface water concentration.
Table 1. Assessment of Sensitivity of TrophicTrace Model to Observed or Estimated Dissolved PCB

Source of Concentrations	*Sediment Concentrations*	*Surface water (ng/L) – P=predicted; M=measured*	*Incremental LCR*	
			Adult	*Child*
***Total estimated by TTM*	*2,170 - 6,500*	*P 68,400 - 213,000*	*8.4E-02*	*1.9E-02*
***Dissolved estimated by TTM*	*2,170 - 6,500*	*P 74,000 - 225,000*	*9.0E-02*	*2.0E-02*
Site Measured Total	*7,280*	*M 168,000 - 229,000*	*2.0E-01*	*4.6E-02*
Site-Specific Dissolved	*265*	*M 32,200 - 87,600*	*3.9E-02*	*8.9E-03*

***Shown in Table B-5 of the EECA for Alt. 1* |

Although the risk outcomes are similar, it was decided that USACE will work to try to accomplish the water column concentrations before the "spill" period begins. (During March, one week of Spring Creek Hatchery spill occurs, but during the remainder of that month, it still should be possible to take some measurements.) There is no enough time this spring to deploy SPMDs. The water data will be used to refine the trophic model (improve accuracy); a second important data use is to inform the designers on receiving water quality for the sake of the In-water Removal Design's consideration of construction-related water quality impacts, i.e., permitting needs.

b) Trophic modeling as used in EE/CA. These are the comments made by the identified party.
- Need to test model with additional data, and modify it to include relevant receptors – USFWS and ODEQ
- Does model over- or under-predict concentration and risk? -- ODEQ & USFSW

John Wakeman presented the existing BSAF information.

Table 2. Clam Biota Sediment Bioaccumulation Factors

Station Location	*W09TS W/in Pile 1*	*W23TS East end of Pile 2*	*W24TS Duplicate of W23TS*	*W23TS Average of 2 at left*	*W22TS West End of Pile 2*	*W21TS Goose Is. Background*
Tissue ug/kg	*604*	*345*	*451*	*398*	*344*	*23.8*
Lipid ug/kg	*0.0333*	*0.0391*	*0.0492*	*0.04415*	*0.0316*	*0.0305*
Sediment ug/kg	*23900*	*200*		*200*	*39.5*	*18*
	77.1					
OC fraction	*0.0015*	*0.0013*	*0.0013*	*0.0013*	*0.0014*	*0.0047*
Clam BSAF	***0.001***			***0.06***	***0.39***	***0.20***
	0.353					

Shaded values are duplicate sediment values

Table 3. Crayfish BSAF

Station Location	*W28TS W/in Pile 1*	*W27TS W/in Pile 2*	*W26TS West End of Pile 2*	*E30TS Duplicate of W26TS*	*W26TS Average of 2 at left*
Tissue ug/kg	*75600*	*11900*	*2970*	*3970*	*3470*
Lipid ug/kg	*0.0391*	*0.0561*	*0.0554*	*0.0574*	*0.0564*
Sediment ug/kg	*23900*	*200*	*39.5*	*39.5*	*39.5*
	77.1				
OC fraction	0.0015	0.0013	0.0014	0.0014	0.0014
Crayfish BSAF	**0.121**	**1.38**			**2.18**
	37.617				

Shaded values are duplicate sediment values

*With one exception (the low duplicate value of 77.1 ug/kg in Pile 1), these BSAFs are <2.2. In contrast, the BSAFs used in the EE/CA are*Used in modeling: *[2.47,2.49,2.52,2.55], all well above the observed values, often by as much as 10 times.*

- Document the model according to the manner that Jennifer Peterson provided –ODEQ

Discussion. John, Paul and Jennifer are to talk about what this means, and design what needs to be done.

- Adjust NOAELs, LOAELs and biomagnifications factors in accordance with info provided – USFWS and ODEQ
- Uncertainty (sensitivity, modeling limitations) analysis for Kow and BSAFs should be provided – ODEQ

Discussion. These will be accomplished in the Responsiveness Summary of the Action Memo to the NTRCA.

c) Sediment characterization in space/time

- Size of exposure area: look at ODFW bass home-range study for Lower Willamette – ODEQ
- Dealing with nondetects in reference areas using maximum-likelihood regression or order statistics – ODEQ
- Explore different ways of summarizing the data – USFWS

Discussion. Jeremy's concern is that the computation method (weighted sampling statistics) is standing in the way of designing a protective remedy. He thought that the alternative selected would be different if a different visualization method were to be used (such as Inverse Distance Weighting).

Jeremy clarified that his concern is with uncertainty; he said he doesn't understand from the current document (EE/CA) where the risk value should be drawn. He thought that some of the areas should be "attached" to the hot spots in order to really reduce the tissue burdens.

We determined to hold a conference call between Jeremy Buck and URS, to include URS' statistician. After the call, we will propose a method for spatial characterization at the next TAG meeting.

d) Tissue characterization in time

- Timing of collections (R2 baseline and predictive relationships; R3 baseline for determination of final action)

Discussion. John said that he believes that the riverine biota will be slow to respond to changes in the PCBs in the sediment environment; and that for that reason, there would be little informational value in sampling before a year or more have passed. Jeremy disagreed; he said he believes that clam and crayfish tissue will quickly respond, a matter of a few months. He asked for tissue sampling in R3, shortly after the removal.

In a related discussion, Jeremy asked if we will provide a procedure for "trigger" points. These would presumably be sediment values that, through a robustly-determined BSAF, would point at possible tissue effects. Such a procedure may ultimately reduce the length of tissue monitoring. This has been forwarded to the RI Work Plan discussions.

3. Further Planning for RI Collections.

a) Use of tissue concentrations as a performance standard. John presented arguments that we can mainly influence sediment concentrations directly, not tissue; therefore, the cleanup will contain a sediment Remedial Action Objective.

Discussion. General agreement on sediment performance standards. Jeremy stated that Chuck Henry's paper (he provided it) has PCB congener data on many osprey eggs for the Columbia River. For osprey, ~40 congeners are measured. Jeremy also agreed that the list of 40 congeners should be included. (We are currently measuring all 209 in the Fish Advisory.) Jeremy believes we can develop a forensic approach to determining what PCBs come from Bradford Island in this way.

b) Classification of Potentially Exposed Populations and Data Needs: Consensus

OU	Analysis	Subanalysis	Population	Location of EPC
Aquatic	Human Health	Tribal	Subsistence Fisher	Above Dam Below Dam (*different?*)
		Non-Tribal	Recreational Fisher	Above Dam Below Dam
			Construction Worker on Trash Rack Dredging	
	EcoRisk	Fish/Shellfish (see next page for endpoint selection)	Res-Level 1	Above Dam Below Dam
			Res-Level 2	Above Dam Below Dam
			Res-Level 3/4	Above Dam Below Dam
			Anad-Level 3/4	Both Above & Below
		Mammals	*Mink, juvenile* [a]	Above Dam Below Dam
		Birds	Osprey [b]	Both Above & Below
			Eagle [c]	Both Above & Below
Upland	Human Health	Non-Tribal	Construction Worker Excavating Upland	On-Island, in soil unit
			Maintenance Worker Contacting Surface Soils	On-Island, in soil unit
			Hypothetical Water Drinker	On-Island
			Industrial Worker Breathing Indoor Air	Sand Blast Building
			Administrative Worker Breathing Outdoor Air	In "Service Area"
	EcoRisk	Aquatic Organisms	(Address in Upland Runoff Analysis)	
		Mammal	Shrew	Burrowing in Soil
			Mink	Visiting Island Living on Island
		Birds	Kestrel	Visiting Island
			Canada Goose	Visiting Island
			Robin	Visiting Island

Notes on table above

[a] According to Jeremy Buck, mink could have a home range that would be entirely on the island. He differs from EPA on this; check Lower Willamette River RI for range. [b] Jeremy stated that grebe, swan, or other waterfowl such as common mergansers would not likely be appropriate endpoints. Jeremy will call the Hamilton and Pierce Islands Wildlife Refuges for information on downstream receptor, to confirm this.
[c] Jennifer Peterson said she would prefer an eagle with a 1-km home range. Jennifer said that the eagle would be protective of osprey, which migrate away from the site 8 months a year, even though they may breed there.

c. Fish species for inclusion.

Species (Assessment Endpoint)	*Surrogate (Measurement Endpoint*	*HH*	*Eco*	*Discussion*	*Sampled Opportun-istically?*
Smallmouth bass	*Smallmouth Bass*	*X*	*X*	*Level 3-4; Fish Advisory Sampling*	*No*
Walleye pike	*Walleye pike*	*X*		*Level 3-4; Fish Advisory Sampling*	*Yes*
Juvenile Salmonid	*Modeling?*		*X*	*Level 3-4. Relevant information may be acquired from the water quality sampling (Spring Creek outflows are timely)*	*Not sampled; depend upon BCF*
Adult Salmonid	*Modeling?*	*X*			*Not sampled; depend upon BCF*
Sucker	*Sucker*		*X*	*Level 1/2*	*No*
Pikeminnow	*Pikeminnow*	*X*		*A crayfish eater when young; becomes piscivorous ¾ level after it exceeds 240 mm*	*No*
White Sturgeon	*White Sturgeon*	*X*	*X*	*Fish Advisory Sampling*	*No*
Lamprey Ammocete	*Lamprey*	*X*		*If found, archive them; note haven't seen these to date in any diver-directed sampling or box cores*	*Yes*

c) Space/time (= phase) representation and alternatives for collection to provide a sufficient data set

- Process for selection of approach.
- Possibly 2 approaches because of with-tissue and without-tissue periods
- Options:
    - Zonal sampling and compositing
    - Gridded sampling and discretes
    - Judgmental sampling with discretes

Discussion of sampling strategy.

A gridwork was discussed. The composites would be comprised of as many of the 4-part grid "cells" as possible. It was apparent that there will need to be more discussion on this.

- Issues:
    - What is the area of exposure?
    - Reference areas (upstream, downstream)?
    - What populations are being compared?

Discussion. We looked at the possible downstream locations for samples, particularly around the west end of Hamilton/Pierce Islands, and discussed whether 3d hydraulic modeling can be of assistance to determine most likely depostional area. Jennifer said she would prefer to sample at stations off the main channel. Jeremy is going to ask

    - How many? -- Use of Visual Sample Plan (or similar) to determine number of samples
    - What is confidence level required?

c) Path forward (when you can expect to see our approach).

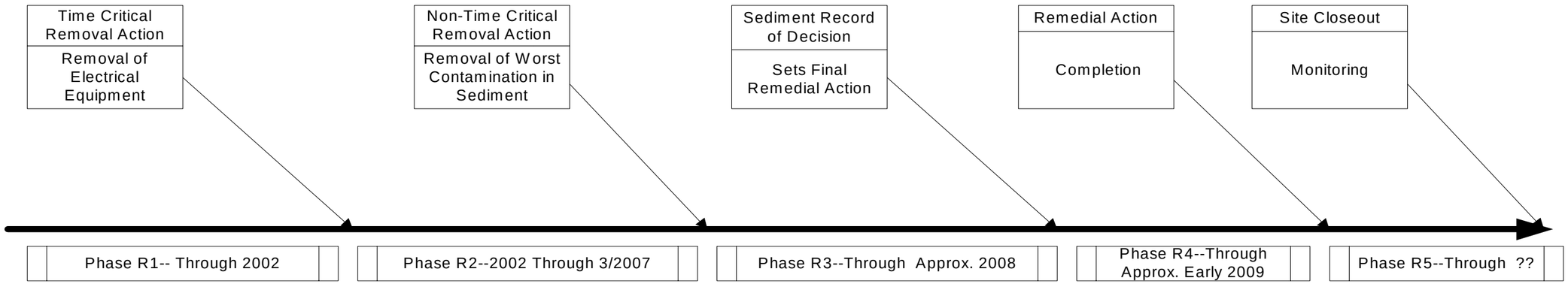
- Fuller discussion at next TAG

Tentative mid-March risk meeting

Bradford Island Project Phases

Sunday, January 29, 2006

River ("R") Series of Investigations



Upland ("U") Series of Investigations