Concentrations of PCBs in Asian Clam Tissue at the mouth of the Vancouver Flushing Channel on the Columbia River

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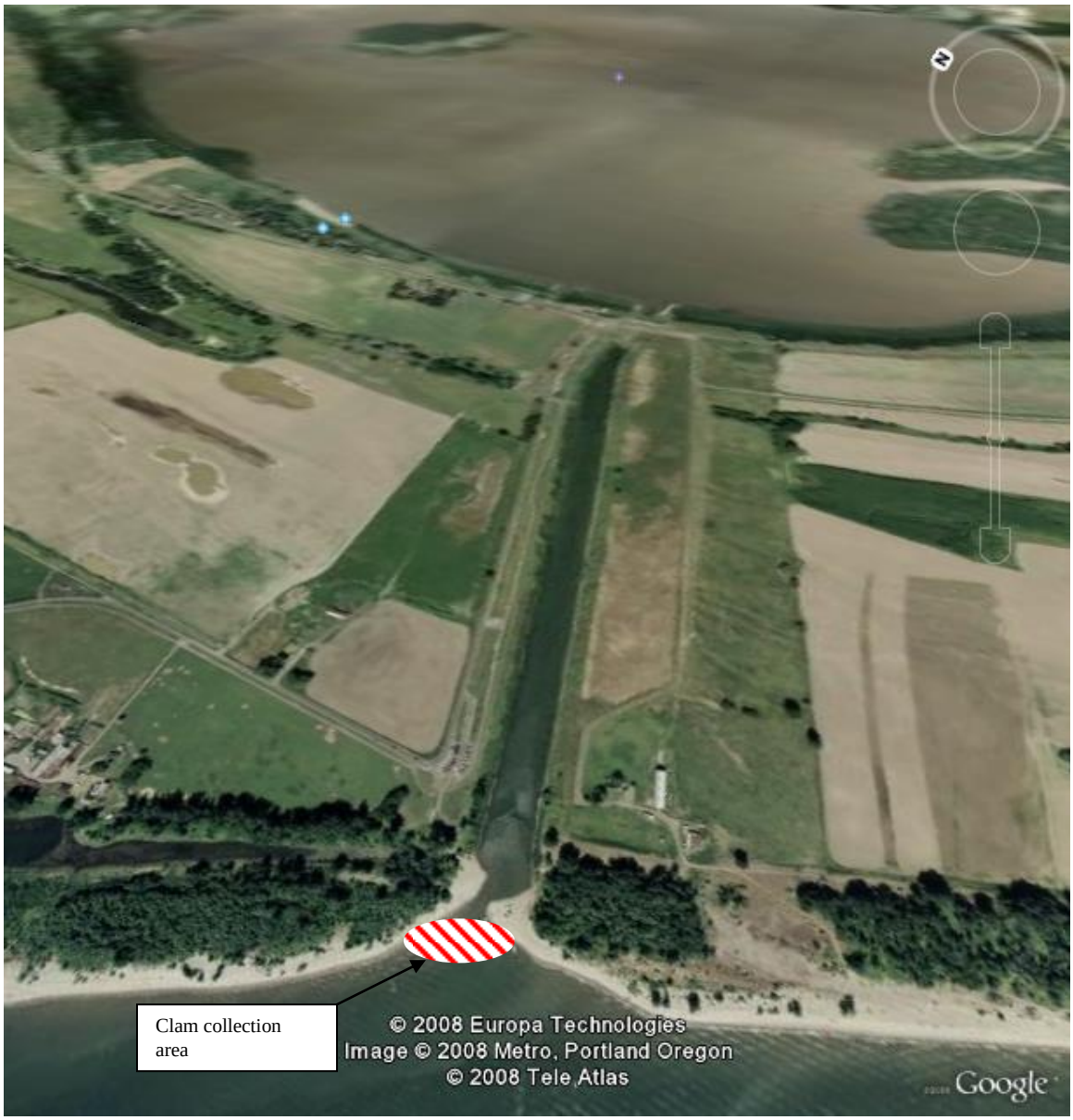
Sampling goal: To assess PCB concentrations in the tissue of Asian clams (*Corbicula Fluminea*) at the mouth of the Vancouver Flushing Channel on the Columbia River. The aerial photo below identifies the sample collection location centered approximately on 45˚ 39' 55.82" N 122˚ 45' 33.87" W.



Clam collection protocol: On September 4, 2007, Asian clams were collected by divers at the mouth of the Vancouver Flushing Channel. Clams were collected from sandy sediment at depths ranging from 6" to 3' within the area identified in the attached aerial photo. Clams were collected whole, placed in a 1 quart glass jar, labeled and stored on ice while unrelated sampling at other sites was conducted. Samples were then transferred to a freezer until they were sent to Columbia Analytical Services (CAS) in Kelso, Washington on 11/19/07 for lab analysis.

CAS shucked the clams, and standard PCB congener and Aroclor analyses were performed using EPA Method 8082 with slight modifications to the sample mass, final extract volume, and cleanup procedures. In order to assure representative sub-sampling for each analytical parameter, all tissue samples were subject to homogenization prior to analysis. To accommodate the relatively large sample mass required to reach the low level detection limits, the samples were extracted using a sonication technique. The extracts are put through GPC and Florisil® cleanups prior to splitting for PCB Aroclor and pesticide analyses. The pesticide fraction generally goes directly to the GC/ECD for analysis. The PCB Aroclor fraction receives an acid cleanup prior to GC/ECD analysis. For ultra low-level Aroclor analysis a Large Volume Injector (LVI) system is used in conjunction with GC/ECD. The attached sample analysis report from CAS describes the PCB concentrations reported from testing.

Note: Divers also surveyed up into the flushing channel several hundred feet from its confluence with the Columbia, but clams were not present.

Results and Discussion:
The detection of Aroclors 1248 (190 µg/Kg) and 1254 (140 µg/Kg) at a total of 330 µg/Kg, and the total of congener specific PCBs at 111.57 µg/Kg. Comparisons with other available study data indicate that Aroclors specific to the PCB hotspot in the Columbia River in front of the Aloca Plant are: 1) also found in sediments samples within the Flushing Channel to Vancouver Lake (*Results of Sediment Sampling at Flushing Channel to Vancouver Lake, Hart Crowser November 2003, for the Port of Vancouver); 2)* also found within clams harvested 5000 feet downstream in the US Army Corps of Engineers Clam Toxicity Study *(Sherman, T., Siipola, M., Abney, R., Ebner, D., Clarke, J., Ray, G., and J.Steevens. Corbicula fluminea as a Bioaccumulation Indicator Species: A Case Study at the Columbia and Willamette Rivers. U.S. Army ERDC Report, Vicksburg, MS., In Press., 2008);*, and 3) also found within fish tissue samples harvested from Vancouver Lake that initiated a 303(d) listing for PCBs in 2004 (*Washington State Toxics Monitoring Program; Toxic Contaminants in Fish Tissue and Surface Water in Freshwater Environments, Seiders, K. 2003, Ecology Pub. 03--03-0112*.) **Note:** The US Army Corps clam toxicity study found Aroclor 1248 near downstream of the Alcoa plant, but not near upstream, suggesting that further studies should include PCB transport downriver from the Alcoa site. Congener concentrations are also elevated near downstream of the Aloca hotspot, but not at near upstream locations. Recommendations for future studies also include testing for organochlorine pesticides as a chromatogram analysis indicated these non-target background components were present.