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MEMORANDUM

July 11, 1986

To: Dave Bradley

From: Art Johnson, Dale Norton and Bill Backous

Subject: Plan for Investigation of PCB Sources to Hylebos Waterway

INTRODUCTION

Hylebos Waterway sediments in segments 2 through 5 are contaminated with PCBs. Maximum concentrations exceed 1,000 ug/Kg (dry) in each segment. The distribution of PCBs is patchy. It is not known if contamination is the result of ongoing or historical sources. Analyses of whole water samples from 17 discharges to the waterway have detected PCBs in only one instance--less than 2 ug/L in a Kaiser Ditch sample collected in April, 1984.

Because PCBs have low water solubility, whole water analysis is not an effective way to screen for these compounds. Remedial action cannot proceed until a clear determination is made as to the existence of ongoing sources. Therefore the Water Quality Investigations Section will survey potential PCB sources through collection of samples of sediment deposits in discharges (storm sewers, drainage ditches, and seeps) to segments 2, 3, and 4. Sediment from seeps at Occidental Chemical Corp. (segment 5) and samples of suspended particulate matter (SPM) from Occidental and Pennwalt Corp. (segment 2) saltwater intakes and process effluents will also be collected.

SAMPLING

Based on reconnaissance surveys on June 6 and June 12, and a discussion with Jim Oberlander, Hazardous Waste, the 47 discharges listed in Table 1 were selected for sampling. This list includes all major and most minor discharges to segments 2, 3, and 4. Although Kaiser Ditch is in segment 1, historical data show PCBs in both water and sediment (980 ug/Kg, dry). The locations of the discharges to be sampled are shown in Figure 1.

Samples of sediment deposits from drainage ditches and accessible storm sewers will be taken within the drain and as near the mouth as possible. Sediment from other discharges will be obtained in the intertidal zone below the outfall. Sediment samples will be collected with solvent-rinsed, stainless steel spoons and homogenized in the field by stirring. Approximately 400 grams of sediment will be collected from each discharge.

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SPM samples at Occidental and Pennwalt will be collected using a polyethylene filter bed holding eight 30-cm glass fiber filters (0.4 micron) in parallel. The weight of each SPM sample will be calculated from the volume of water filtered and the total suspended solids concentration of a composite whole water sample collected during the filtration period. A sample size of about 1 gram is expected.

Sample containers will be priority pollutant-cleaned glass jars with teflon-lined screw closures. Samples will be kept on ice in the field. PCB samples will be stored frozen until analyzed. Chain-of-custody procedures will be followed. Safety procedures and guidelines specified in Tetra-Tech, Inc. (1986) Site Safety Plan for the Commencement Bay Nearshore/Tideflats Feasibility Study will be observed in this investigation.

ANALYSIS

Sediment samples will be analyzed for PCB mixtures, total organic carbon, grain size, and percent dry weight. SPM samples will be analyzed for PCB mixtures only. A laboratory has not been selected to do the PCB or total organic carbon analyses. Parametrix Inc., Bellevue, will do grain size.

PCB analysis and quantitation will follow Tetra-Tech, Inc. (1986) Analytical Methods for USEPA Priority Pollutants and 301(h) Pesticides in Estuarine and Marine Sediments. Elemental sulfur will be removed from all samples. Because of probable interferences from chlorinated compounds, Occidental samples will be analyzed by GC/MS following Method 680. A detection limit of 50 ug/Kg will be needed for PCBs in sediment. Detection limits may be on the order of 200 ug/Kg for suspended particulate samples.

Excess sample will be stored frozen for possible additional analyses.

QUALITY ASSURANCE

The investigation will follow the procedures and guidelines specified in Tetra-Tech, Inc. (1986) Quality Assurance Project Plan for Field Investigations to Support Commencement Bay Nearshore/Tideflats Feasibility Study.

Precision and accuracy will be assessed through analysis of duplicate samples, replicate field samples, a standard reference material, and matrix spikes. The frequency of these analyses will meet or exceed the requirements specified in the Tetra-Tech quality assurance plan. The comparability between methods employed for PCB analysis of Occidental samples and samples from other parts of the waterway will be evaluated by analysis of duplicates. Standard EPA Contract Laboratory Program guidelines will be followed by the laboratory doing the PCB analyses. All data will be subjected to outside QA review.

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COSTS

In addition to the cost of sample analyses estimated in Table 2, approximately \$1,500 will be needed to purchase a pump, tubing, fittings, and filters for collecting SPM samples.

TARGET DATES

<u>Activity</u>	<u>Date</u>	<u>WQIS Personnel</u>
Field sampling completed	September 30, 1986	D. Norton, A. Johnson, M. Stinson
Samples to laboratory	October 1, 1986	M. Stinson
Data received	November 3, 1986	--
QA review completed	November 21, 1986	--
Data to Tetra-Tech, Inc.	November 26, 1986	M. Stinson
WQIS draft report	December 31, 1986	M. Stinson, A. Johnson
WQIS final report	January 30, 1987	M. Stinson, A. Johnson

AJ:DN:BB:cp

Attachments

Table 1. List of Sampling Sites

Discharge Number†	Name/Description
	<u>North shore; segment 5</u>
85	Occidental seep #1
707	Occidental process effluent
---	Occidental saltwater intake
83	Occidental seep #2
83	Occidental seep #3
	<u>North shore; segment 4</u>
78	11th Street drain
---	Old Tacoma steam plant seep #1
75	Old Tacoma steam plant drain
---	Old Tacoma steam plant seep #2
---	Old Tacoma steam plant junction box
---	Seepage under wood bulkhead
73	Drainage from old locomotive yard
---	Old locomotive yard channel
72	Cenex drain
---	Cenex seepage under pot-liner rip-rap
	<u>North shore; segment 3</u>
71	Buffelen drain
70	Buffelen discharges
69	Buffelen drain
66	Lincoln Avenue drain
65	Murray Pacific drain
63	Murray Pacific drain
62	US Gypsum drain
	<u>North shore; segment 2</u>
59	Pennwalt seep #1
---	Pennwalt seep #2
58	Pennwalt process effluent
---	Pennwalt saltwater intake
---	Pennwalt seep #3
---	Pennwalt seep #4
54	East Channel ditch at mouth
54	East Channel ditch above Pennwalt

Table 1 - continued.

Discharge Number†	Name/Description
	<u>North shore; segment 1</u>
52	Kaiser ditch mouth
51	Weyerhaeuser ditch
52	Kaiser ditch at Alexander Avenue
---	Tacoma substation drain at Kaiser pond
---	Bonneville substation drain at Kaiser pond
	<u>South shore; segment 2</u>
34	General Metals drain #1
34	General Metals drain #2
34	General Metals drain #3
---	General Metals west end drainage
28	Morningside ditch
	<u>South shore; segment 3</u>
23	Marine Drive drain
21	Marine Drive drain
20	Cascade Timber drain
	<u>South shore; segment 4</u>
19	Sound Refining drain
704	Sound Refining process effluent
17	Sound Refining drain
13	Marine Drive drain
11	Marine Drive drain

†Tacoma - Pierce County Health Department

Table 2. Estimate of analytical costs.

Parameter	Cost/Sample	Number of Samples	Total Cost
PCBs (segments 2, 3, 4)	\$125 (Cal Analytical)	54†	\$ 6,750
PCBs (segment 5)	\$250 (Cal Analytical)	6*	1,500
grain size	\$ 65 (Parametrix)	51††	3,315
total organic carbon	\$ 30 (Laucks)	51††	1,530
Total			<u>\$13,095</u>

†42 sediment and SPM samples + 20% QA samples
+ 4 contingency samples = 54 total samples

*5 sediment + 20% QA samples = 6 samples

††43 sediment samples + 10% QA samples
+ 4 contingency samples = 51 total samples

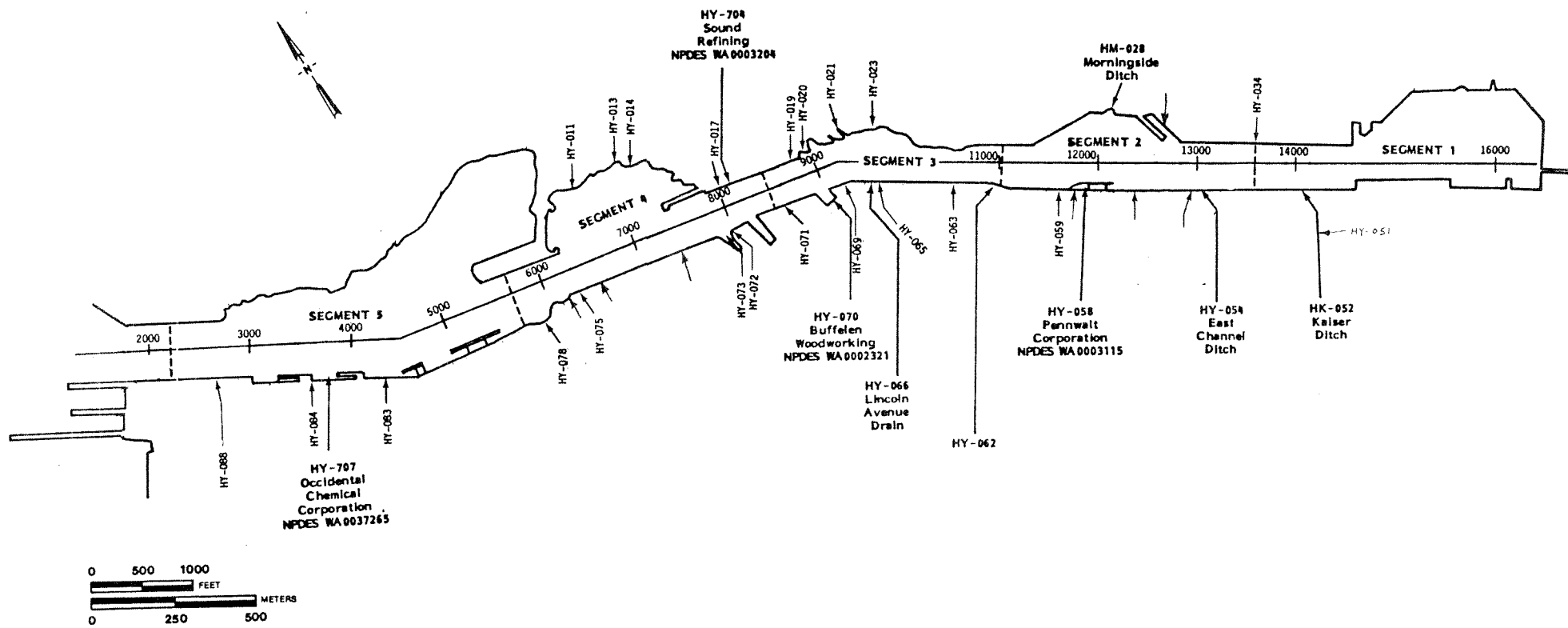


Figure 1. Locations of Sampling Sites