

30 July 1992

SUBJECT: DETERMINATION OF THE SUITABILITY OF DREDGED MATERIAL TESTED FOR THE WEYERHAEUSER BAY CITY DOCK PROJECT (OYB-2-014739) FOR DISPOSAL AT EITHER THE SOUTH JETTY OR POINT CHEHALIS OPEN-WATER ESTUARINE SITES, OR AT THE 3.9 MILE OCEAN DISPOSAL SITE.

1. Weyerhaeuser, in a letter dated 11 February 1992, proposed dredging approximately 12,000 cubic yards of sediments from its Bay City Dock. The agencies with jurisdiction over dredging and disposal (Corps of Engineers, Department of Ecology, Department of Natural Resources and the Environmental Protection Agency) established requirements for sampling and testing of the proposed dredged sediments in a letter from the Corps' Dredged Material Management Office (DMMO) dated 14 February 1992. Because of Weyerhaeuser's need to perform emergency dredging to remove shoals which threatened the safety of incoming vessels, the agencies agreed to use the testing data to determine, in part, the suitability of future maintenance material for open-water disposal.

Weyerhaeuser dredged approximately 13,000 cubic yards of sediments from its Bay City Dock between 29 February and 4 March 1992, and disposed of it at the Pt. Chehalis site. Approximately 8000 cubic yards of additional material has since slumped from the side slopes of the project. Weyerhaeuser proposes to perform cleanup dredging of this material before 15 September 1992.

2. The following summary reflects the regulatory agencies' suitability determination for the 13,000 cubic yards of material already disposed of at the Pt. Chehalis site, as well as the 8000 cubic yards of sloughed material proposed for dredging and disposal before 15 September 1992. The determination of suitability is based on the acceptability of the sampling plan and test data contained in the July 1992 Sediment Characterization Report by Parametrix.
3. One dredged material management unit (DMMU) was characterized. DMMU C1 consisted of composited sediments from four sampling locations adjacent to the dock.
4. The chemistry data indicated that seven detected exceedances of the Dredging Year 1992 PSDDA (Puget Sound Dredged Disposal Analysis) screening levels (SL) occurred for C1 (See Attachment 1). There was also one chemical of concern with its detection limit reported above SL. There were no bioaccumulation trigger (BT) or maximum level (ML) exceedances. PSDDA SLs are used in Puget Sound to establish a concern for biological effects; any exceedance of a screening level results in the requirement to conduct standard biological testing. In the context of Grays Harbor testing, PSDDA sediment quality guidelines are being used as an interim yardstick until separate evaluation procedures for Grays Harbor can be adopted.

5. Dioxins and furans were quantitated for C1 by Triangle Laboratories of Durham, North Carolina. The original sample analyzed by Triangle was contaminated during analysis and the regulatory agencies discarded the data from that round of testing. An additional sample from C1 was sent to Triangle for reanalysis. The QA/QC data for the second round of testing were acceptable. The most toxic congener, 2,3,7,8-tetrachloro-dibenzo-p-dioxin, was detected at 3.70 and 3.50 parts per trillion (ppt) in duplicate analyses. The total toxic equivalent concentration (TEC) of all dioxins and furans (detected and undetected) was 11.97 and 9.87 ppt (see Attachment 2).

In the toxicity equivalency approach in which TECs are calculated, polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) that include substitution with chlorine at the 2, 3, 7, and 8 positions are assigned a toxicity equivalency factor (TEF). The TEF is used to calculate TECs relative to 2,3,7,8-TCDD, the most toxic member of the group of PCDDs and PCDFs.

The TEC approach is used to estimate the potential toxicity to mammals of PCDDs and PCDFs bioaccumulated in mammal tissue. It has limited applicability to sediment because it does not consider the relative bioavailability of the congeners. Accordingly, TEC overstates toxicity to mammals when applied to sediments. TEC as a toxicity measure does not apply to fish, shellfish or birds. However, TEC does allow for a quick comparison of this one measure of dioxin and furan toxicity among sediment samples.

Based on the regulatory agencies' present best professional judgement, the concentration of 2,3,7,8-TCDD and the calculated TEC are unlikely to be environmentally harmful for this project. The agencies' consensus is that the material is suitable for unconfined open-water disposal relative to these dioxin test results.

6. The PSDDA agencies required biological testing for C1 based on the numerous SL exceedances. The amphipod 10-day acute toxicity test, echinoderm sediment larval combined mortality and abnormality (effective mortality) test, the *Neanthes* 10-day acute toxicity test, the *Neanthes* 20-day biomass test and the Microtox bacterial luminescence test were conducted. PSDDA interpretation guidelines specified in the Phase II Management Plan Report (Sept 1989), modified by changes made at the second and fourth annual review meetings, were used to evaluate the bioassay data. The control sediment for the amphipod and *Neanthes* bioassays was collected at West Beach, while the seawater control for the sediment larval test came from the Duwamish Head. The reference sediment (all bioassays) came from Carr Inlet. One reference sediment, Parametrix's Carr 6, was used.

7. Due to the high proportion of fines in the test sediment, the regulatory agencies agreed to the use of *Ampelisca abdita* instead of *Rhepoxynius abronius*. Quality control problems were encountered in the first batch attempted, with high mortality observed in the control sediment. The sediment holding time had expired by this time but the agencies agreed to proceed with a retest since dredging had occurred in the interim and none of the original

sediment was available for sampling. There were no QA/QC problems in the second batch and no hits occurred.

8. In the sediment larval test, the Carr 6 reference sediment did not meet its performance standard. The seawater-normalized effective mortality was 28.5%, which is greater than the 20% allowed under PSDDA guidelines. However, the effective mortality for the test sediment was 19.7%. For any "hit" to occur, the seawater-normalized effective mortality of the test sediment must be greater than 20%. Because the seawater-normalized effective mortality of C1 was not greater than 20%, no comparison to reference needed to be made, and no hit occurred in the sediment larval test. The reference sediment performance failure was irrelevant.

9. There were no hits for the *Neanthes* 10-day mortality, *Neanthes* 20-day biomass or Microtox bioassays.

10. In summary, quality assurance/quality control guidelines specified by PSDDA were generally complied with. The data gathered were deemed sufficient and acceptable for regulatory decision-making. Based on the results of the chemical and biological testing, the following consensus decision was made by the regulatory agencies:

The 13,000 cubic yards dredged in Feb/March from the Weyerhaeuser Bay City Dock were suitable for open-water disposal at the Pt. Chehalis disposal site. The approximately 8,000 cubic yards of maintenance dredging to be performed before 15 September 1992 are suitable for open-water disposal at the Point Chehalis, South Jetty, or 3.9 Mile ocean disposal sites. Under the "Interim Evaluation Guidelines for Testing Sediments Proposed for Dredging from Regulated Projects in Grays Harbor and Willapa Bay (16 July 1992)", the Weyerhaeuser Bay City Dock is ranked low-moderate. The total volume of 21,000 cubic yards is within the size limit (32,000 CY) of dredged material management units in low-moderate ranked areas.

11. This suitability determination covers only those sediments already dredged and the approximately 8,000 cubic yards of cleanup dredging which will occur before 15 September 1992. For dredging proposed subsequent to 15 September 1992, a sampling and testing plan will be required. A sampling and analysis plan, prepared in adherence to the "Interim Evaluation Guidelines", must be submitted to the Dredged Material Management Office for coordination with the regulatory agencies. Testing results must be submitted to the DMMO and a signed suitability determination must be obtained prior to future dredging.

Concur:

July 31, 1992
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ATTACHMENT 1

Weyerhaeuser
 Bay City Dock
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DY92 Sediment Guideline Values					
Chemical-of-Concern	SL	BT	ML	C1 (rep 1)	C1 (rep 2)
Acenaphthene	63	--	630	200	220
Fluorene	64	--	640	140	150
Phenanthrene	320	--	3200	420	430
2-Methylnaphthalene	67	--	670	200	170
Total LPAH	610	--	6100	1169	1187
Benzoic Acid	400	--	690	410	470
Dibenzofuran	54	--	540	120	130
Hexachlorobutadiene	29	212	290	35 U	35 U

ATTACHMENT 2

Weyerhaeuser
 Bay City Dock
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Congener/Isomers		C1-rep 1 (ng/kg)	C1-rep 2 (ng/kg)	Toxic Equivalency Factor (TEF)
Dioxins	2,3,7,8-TCDD	3.7	3.5	1.0
	1,2,3,7,8-PeCDD	4.1	2 ¹	0.5
	2,3,7,8-HxCDDs	23.9	19.2 ¹	0.1
	1,2,3,4,6,7,8-HpCDD	125	118	0.01
	OCDD	935	917	0.001
Furans	2,3,7,8-TCDF	4.9	5.2	0.1
	1,2,3,7,8-PeCDF	0.6	.29 ¹	0.05
	2,3,4,7,8-PeCDF	0.77	.425 ¹	0.5
	2,3,7,8-HxCDFs	4.98 ¹	3.83 ¹	0.1
	2,3,7,8-HpCDFs	19.8	18.8 ¹	0.01
	OCDF	45.2	42.3	0.001
Total TEC:		11.97	9.87	

¹Includes undetects at one-half the detection limit

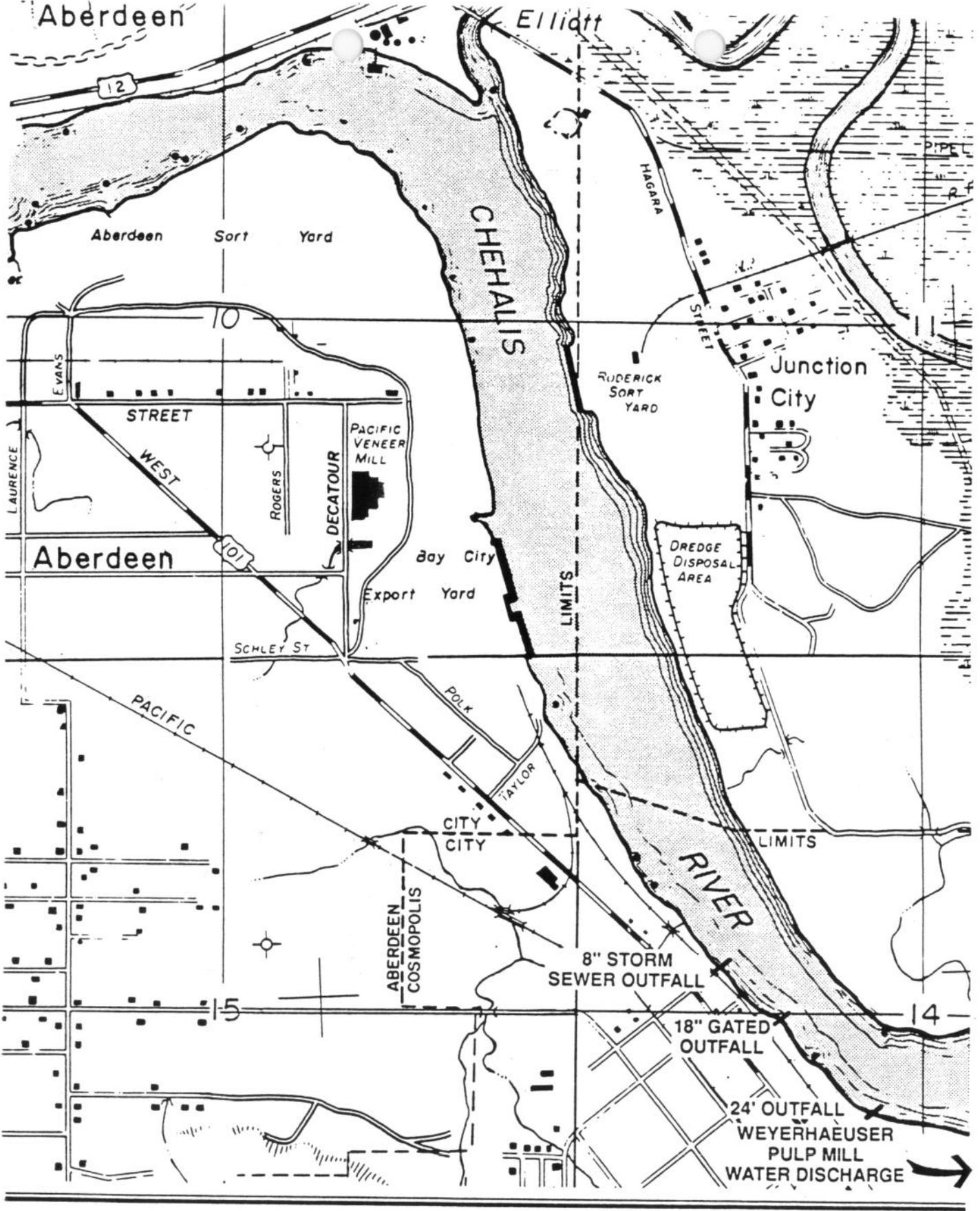


Figure 1.
 Site Location and Sources
 of Pollution to Chehalis

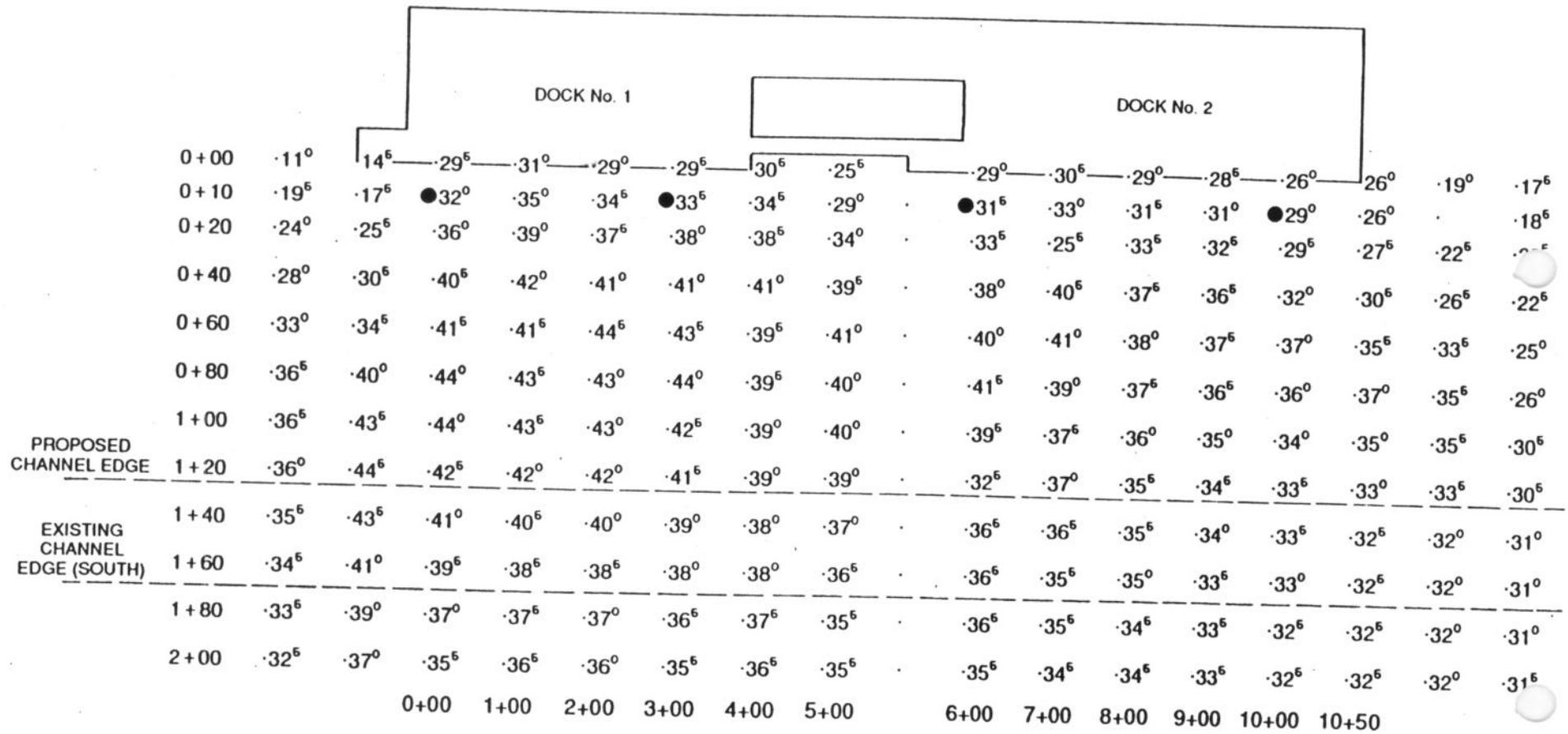


Figure 2.
Sounding Grid and Proposed Sample Sites for the Weyerhaeuser Dock

● Sample Sites