

MEMORANDUM FOR RECORD

1 July 1992

SUBJECT: DETERMINATION ON THE SUITABILITY OF DREDGED MATERIAL TESTED FOR THE PORT OF GRAYS HARBOR TERMINAL TWO MAINTENANCE DREDGING AREA FOR DISPOSAL AT EITHER THE SOUTH JETTY OR POINT CHEHALIS ESTUARINE OPEN WATER DISPOSAL SITES, OR AT THE 3.9 MILE OCEAN DISPOSAL SITE.

1. The following summary reflects the consensus determination of the Agencies' (U.S. Army Corps of Engineers, Department of Ecology, Department of Natural Resources, and the Environmental Protection Agency) with jurisdiction on dredging and disposal on the suitability of the estimated 80,000 cubic yards of material scheduled for maintenance dredging from the Terminal Two berthing area for disposal at either the South Jetty or Point Chehalis estuarine disposal sites, or at the 3.9 mile ocean disposal site. The determination of suitability is based on the acceptability of the sampling conducted and all relevant test data contained in April 23, 1992 SAIC Data Summary Report. The results of these testing data will be used to assess future management plans for 1993 maintenance dredging as agreed to by the Agencies with jurisdiction over dredging and disposal (U.S. Army Corps of Engineers, Environmental Protection Agency, Washington State Departments of Ecology and Natural Resources).
2. The Agencies' approved sampling and testing plan was followed, and quality assurance/quality control guidelines specified by PSEP and the PSDDA program were generally complied with. The data gathered were deemed sufficient and acceptable for decision making by the Agencies based on best professional judgement.
3. Chemistry data from one composited sample from six sampling locations indicated that there were no chemical exceedances of PSDDA screening level values except benzoic acid, which was quantitated at 1200 ppb (1.7 X ML), and hexachlorobutadiene, where the detection limit slightly exceeded the PSDDA SL of 29 ppb at 30 ppb. PSDDA SL's are used in Puget Sound to establish a concern for biological effects, where chemicals below the SL have a low level of concern, and chemicals exceeding the maximum level (ML) may likely demonstrate biological effects and be unsuitable for unconfined openwater disposal. PSDDA guidelines stipulate that one exceedance of ML, where the exceedance is less than 100 percent over ML, will require biological testing to determine the suitability outcome. In this context, PSDDA SLs and MLs were used in Grays Harbor as an interim yardstick to evaluate chemical concentration levels measured in sediments. Based on the chemistry data results discussed above, biological testing was required and are discussed in paragraph 7 below.
4. One composited sediment sample was also analyzed for dioxins by Twin City Testing Corporation utilizing EPA method 8290. These data are summarized in Table 1. Results indicated that 2,3,7,8 TCDD (Tetrachloro-Dibenzo-p-Dioxin) was detected at 2.1 ppt (parts per trillion). This congener is regarded by the EPA as the most toxic form of dioxin. A few other less toxic dioxin congeners were detected at low parts per trillion concentrations. In the following table, the toxicity equivalence in terms of 2,3,7,8-TCDD is shown for the nine most toxic congeners of furan and dioxin.

5. One way to summarize potential toxicity for mammals is to calculate the toxicity equivalent concentrations (TEC) measured in tissue. Total TEC is calculated by multiplying the toxicity equivalent factor (TEF) by the congener specific concentration and summing the TEC's for all congeners. Total TEC comparisons are usually used for food ingestion, and have limited applicability to sediment because TEC **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. For comparison purposes only, the TEC totaled 5.9 pptr for all congeners of dioxin quantified by EPA method 8290.

Table 1. Native congeners of Dioxin quantitated in Port of Grays Harbor Terminal Two sediments.

NATIVE CONGENERS ¹ (pptr)	TEF ²	C-1	C-1 (TEC)
2,3,7,8-TCDD	1	2.1	2.1
1,2,3,7,8-PeCDD	0.5	2.8	1.4
1,2,3,7,8-HxCDD	0.1	10.6	1.1
1,2,3,4,7,8-HpCDD	0.01	37	0.4
OCDD	0.001	210	0.2
2,3,7,8-TCDF	0.1	1.7	0.2
1,2,3,7,8-PeCDF	0.05	0.2	0.01
2,3,4,7,8-PeCDF	0.5	0.34	0.2
1,2,3,7,8-HxCDF	0.1	1.45	0.15
1,2,3,7,8-HpCDF	0.01	8.6	0.1
OCDF	0.001	16	0.02
TOTALS:			5.9

¹ TCDD = Tetrachlorodibenzodioxin TCDF = Tetrachlorodibenzofuran
 PeCDD = Pentachlorodibenzodioxin PeCDF = Pentachlorodibenzofuran
 HxCDD = Hexachlorodibenzodioxin HxCDF = Hexachlorodibenzofuran
 HpCDD = Heptachlorodibenzodioxin HpCDF = Heptachlorodibenzofuran
 OCDD = Octochlorodibenzodioxin OCDF = Octochlorodibenzofuran

² TOXICITY EQUIVALENT FACTOR

6. Based on the Agencies' present best professional judgment, these low concentrations are unlikely to be environmentally harmful for this project. The Agencies' consensus is that the material is suitable for either estuarine or ocean unconfined open-water disposal relative to these dioxin test results.

7. Bioassay testing results are summarized in Table 2 below. The results indicated that the composited sample passed the PSDDA interpretation guidelines for dispersive sites.

Table 2. Biological Testing Summary.

STATION	Amphipod Mortality (%)	Echinoderm Mortality (%)	10-day Neanthes Mortality (%)	Microtox Test (% light change)	PSDDA pass/fail
Control	6.0	N/A	3.0	N/A	-
Carr Inlet Reference	24.0	4.3	4.0	-14.15	-
C-1	22.0	11.0	14.0	-16.53	pass

8. The Agencies concluded based on the above discussion and summary of sediment chemical and biological characterization results for the Port of Grays Harbor's Terminal Two berthing area maintenance area, that all the dredged material tested (80,000 cubic yards) is suitable for disposal at either the South Jetty or Point Chehalis estuarine disposal sites, or at the 3.9 mile ocean disposal site.

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Concur:

19 August 1992
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17 August 1992
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13 July 1992
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8 July 1992
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Enclosures

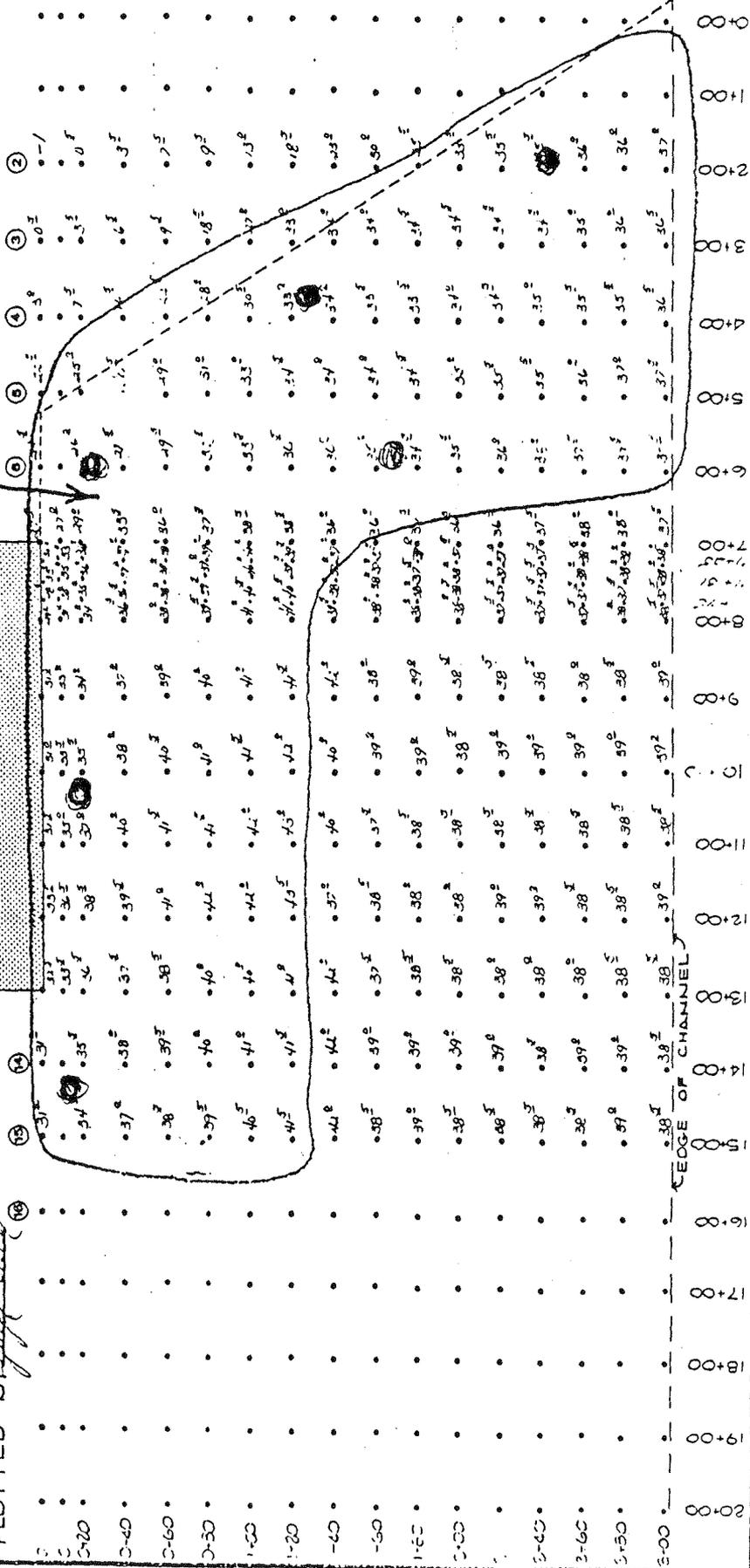
Copies Furnished:

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DMMO File

FBB

FLOOD
SOUNDED BY *Byrd's Trawl*
PLOTTED BY *Byrd's Trawl*

Area to be
Dredged



SOUNDING GRID
TERMINAL NO. 2

PORT OF
GRAYS HARBOR

DATE SOUNDED:
DATE LAST SOUNDED:
DATE LAST DREDGED:

1911 12 20
1911 12 20
C. J. ...