10/24/91

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BEFORE THE ADMINISTRATOR

In the Matter of	)	
	)	
Port of Oakland and Great Lakes Dredge and Dock Company,	)	**Docket No. MPRSA-IX-88-01**
	)	
	)	
Respondents	)	

Marine Protection, Research and Sanctuaries Act - Rules of Practice - Amendment of Complaint - Evidence

Where evidence beyond the scope of pending counts in complaints against the permittee and its dredging contractor was admitted based on Complainant's argument the evidence was relevant to the amount of an appropriate penalty for violations of the Act, Complainant was bound by the choice made and could not thereafter move to amend the complaint based upon the contention an amendment was proper in order to conform the complaint to the proof. Where proposed second amended complaint was based on a lack of understanding of clamshell dredging practices and limitations and, in any event, additional counts in proposed amended complaint against dredging contractor were not substantiated, leave to file second amended complaint was denied.

Marine Protection Research and Sanctuaries Act - Suitability For Ocean Disposal - Unpermitted Dredging and Dumping - Gravity of Violation

Even though validity of Regional Administrator's determination under MPRSA that certain materials from an Oakland Inner Harbor dredging project were unsuitable for ocean disposal could not be administratively contested, the propriety of such determination was held relevant to gravity of violation for unpermitted dredging and resulting ocean disposal, and where materials could appropriately have been determined to be suitable for ocean disposal, a serious or grave violation of the Act for unpermitted dredging and dumping was not established.

Marine Protection, Research and Sanctuaries Act - Unpermitted Dredging and Dumping - Gravity of Violation - Determination of Penalty

Section 105 of the Act providing that gravity of the violation is among factors to be considered in determining penalty for violations of Act was considered from two aspects, i.e., gravity of harm and gravity of misconduct, and where evidence established that materials involved in unpermitted dredging and ocean disposal could appropriately have been determined suitable for ocean disposal, gravity of harm or potential harm was not serious and, inasmuch as unpermitted dredging resulted from a navigational error occasioned by an inadvertent transposition of data entered into a computer, the gravity of the misconduct was also determined to be slight. These determinations resulted in the severe penalty sought by the Agency against the Port's dredging contractor being held unwarranted and penalty assessed was reduced to a fraction of the amount claimed.

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INITIAL DECISION

This is a civil penalty proceeding under section 105 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. § 1415). The proceeding was commenced by a complaint, signed by the Director, Water Management Division, U.S. EPA, Region IX, on June 1, 1988, charging Respondents, Port of Oakland (Port) and Great Lakes Dredge and Dock Company (Great Lakes) with violations of the Act and a permit issued by the U.S. Army Corps of Engineers (Corps). The permit issued on May 5, 1988, authorized the Port to dredge the existing lower four miles of the Oakland Inner Harbor Federal Channel (Federal Channel or Channel) from the authorized -35 feet mean lower low water (MLLW) to -38 feet MLLW plus one foot allowable overdepth and dispose of approximately 400,000 cubic yards of resulting sediments at Ocean Disposal Site B1B, located approximately 11 miles west of the San Mateo County line and 25 nautical miles southwest of the Golden Gate Bridge. The Port contracted with Great Lakes to perform the dredging and disposal. The complaint alleged that notwithstanding the permit specifically prohibited dredging in areas of the Turning Basin located outside of the existing Federal Channel, referred to as areas A-1 and A-2, until the location of an appropriate disposal site for the dredge material had been determined, Respondents nevertheless, dredged approximately 8,900 cubic yards from such areas during the period 8:30 a.m. on May 14, 1988, to 5:30 p.m. on May 15, 1988. It was further alleged that this unpermitted material was taken to the disposal site in three separate scow loads on May 14 and May 15,

1988. Additionally, it was alleged that Respondents attempted to dump Load No. 4, containing unpermitted material at the B1B site, but were unable to do so because the disposal doors malfunctioned, and that during the transit from and to the Port, a substantial portion of the load was lost in the Contiguous Zone or Territorial Sea of the United States. For these alleged violations, it was proposed to assess the Port a penalty of $150,000 and Great Lakes a penalty of $100,000.

The Port answered, essentially denying the alleged violations, alleging, inter alia, that the material was in fact suitable for ocean disposal, asserting that the proposed penalty was excessive and not in accordance with the Act and requested a hearing. Great Lakes answered, admitting, inter alia, that, due to an undiscovered and inadvertent navigational error, it may have dredged some materials from the A-2 area and from an unpermitted area adjacent to the Federal Channel, as well as from the Federal Channel on May 14, 1988 and/or May 15, 1988. Great Lakes alleged that the proposal penalty was assessed without due and proper consideration of all the factors in 33 U.S.C. § 1415 (a), and requested a hearing.

Under date of September 9, 1988, Complainant moved to amend the complaint so as to add Counts 4 through 8 alleging that Respondents dumped Loads Nos. 1, 2, 3, 4 and 6 more than 60 meters from the center of the B1B site in violation of the Act and the permit. Additionally, it was alleged (Counts 9 through 14) that the Port failed to determine through volumetric measurement the

amount of dredged material lost during each of six disposal trips to the B1B site and to report the percentage of dredged material lost in violation of the Act and the permit; that the Port (Counts 15 to 20) failed to measure and record the density of dredged material in each of six barge loads (Load Nos. 1-6) dumped in the Territorial Sea or Contiguous Zone with a nuclear density device as required by Special Condition 4(a) of the permit and failed to calculate the bulk density of the material in the six scow loads and submit this information to the Corps as required by Special Condition 4(c) of the Permit and that the Port (Counts 21 and 22) failed to use a navigation system accurate to plus or minus three meters in positioning the disposal vessel for the dumping of Load Nos. 1 & 2 and failed to determine and report to the Corps the disposal vessels' locations for these loads at one-minute intervals when the disposal vessel was within one-nautical mile of the B1B site as required by Special Condition 4(g) of the permit. The amended complaint proposed to increase the penalty assessed against the Port to $225,000 and to increase the penalty assessed against Great Lakes to $175,000. Over the opposition of Respondents the motion to amend the complaint was granted by an order, dated September 30, 1988.[1/]

[1/] Complainant has filed a motion for leave to file a second amended complaint to add new counts, allegedly to conform to evidence adduced at the hearing. For the reasons hereinafter appearing, however, it is concluded that the alleged additional violations have not been substantiated, or that the proposed amendment is otherwise inappropriate. The motion will be denied.

Respondents filed answers to the amended complaint, essentially repeating their prior answers to the original counts, denying the violations alleged in the additional counts, contesting the proposed penalties as excessive and contrary to the Act and requested a hearing.

The instant project was the initial phase of a larger project authorized by the Water Resources Development Act of 1986 (P.L. 99-662) which was ultimately intended to increase the depth of the Inner and Outer Harbor of the Federal Channel to -42 feet MLLW, including the construction of a 1,200-foot turning circle or basin at the eastern terminus of the Inner Harbor and which would involve the dredging and disposal of approximately 6.5 million cubic yards of additional material. As might be expected, there was controversy over the disposition not only of the initial 400,000 cubic yards of material, but also over the disposition of the much larger quantity required to lower the Federal Channel to a depth of -42 MLLW. Ocean disposal of such material is far less expensive than land disposal. Although permits for dredging are issued by the Corps, MPRSA section 103(c) (33 U.S.C. § 1413(c)) allows the Administrator of EPA to in effect veto the ocean disposal of such material and the only administrative remedy provided is for the Secretary of the Army to request a waiver from the Administrator in accordance with section 103(d) of the Act.[2/] Accordingly, it is

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[2/] A waiver can be requested only if it is determined that there is no economically feasible alternative method or site. The only apparent avenue of relief from an arbitrary determination, other than the waiver procedure provided by MPRSA section 103, is (continued...)

clear that the validity per se of the Regional Administrator's unsuitability determination is not at issue herein. The ALJ ruled, however, that evidence of the factual basis for the unsuitability determination and the impact of disposing of the material in the ocean was relevant and admissible on the issue of the gravity of the alleged violations. It follows that, if the Regional Administrator's determination that certain of the material was unsuitable for ocean disposal is factually and legally insupportable, then Complainant's contention that the alleged violations are serious, warranting the severe penalties sought herein, should be rejected. Such a conclusion would not, of course, alter the determination, which is essentially undisputed, that unauthorized dredging and disposal occurred.

After extensive pretrial proceedings which included the taking of several depositions by agreement of the parties and decisions on several motions, an extended hearing on this matter was held in the Port's offices in Oakland, California.[3/]

[2/](...continued)
judicial review pursuant to the Administrative Procedure Act. Because the Regional Administrator is bound by the "criteria" in making determinations of the suitability of dredged material for ocean disposal, this is not a matter committed to agency discretion by law. See, e.g., Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402 (1971).

[3/] This resulted in a massive record consisting of 25 volumes of transcript, over 150 exhibits introduced by the Port, over 170 exhibits introduced by Complainant and 17 exhibits introduced by Great Lakes. Many of these exhibits are voluminous documents, e.g., Draft Navigation Improvements Design Memorandum Number 1, General Design and Final Supplement To The Environmental Impact Statement, Alameda County, California, March 1988 (Port's Exh 4), (continued...)

Based on the entire record, including the briefs and proposed findings of the parties,[4/] I make the following:

FINDINGS OF FACT

1. The Port of Oakland is a department of the City of Oakland, a municipal corporation. The Port is operated by a Board Of Port Commissioners. On March 23, 1988, the Port issued an invitation for bids, inviting bids or proposals for the dredging of the "Oakland Inner Harbor Channel to Elevation -38 feet, M.L.L.W., Oakland, California" (Port's Exh 16). The invitation contained two bid items, provision for a unit price for the dredging of an estimated 420,000 cubic yards of material and a separate item entitled "Demobilization/Remobilization." Closing date for the receipt of bids was 11:00 a.m. April 6, 1988.

2. Relevant here is para. 1.03 of the Special Provisions "Scope Of Work," which provides, inter alia, that the channel and turning circle shall be dredged using clamshell equipment to the minimum required depth as shown in the Plans.

[3/](...continued)
hereinafter GDM, the Final EIS (Port's Exh 5A), the deposition of Dr. Brian Melzian (C's Exh 103), the Battelle Report (C's Exh 106) and the deposition of Brian Walls (Port's Exh 149). Briefs of the parties total hundreds of pages.

[4/] Subsequent to the conclusion of the hearing and the submission of final briefs, a consent agreement was executed, settling this matter as to the Port. The Port's briefs and proposed findings have, however, been considered. The matter was on hold while the consent agreement was negotiated. Proposed findings of the parties not adopted have either been rejected or are considered unnecessary to the decision.

Additionally, "(a)t the turning circle, all material which sloughs into areas to be dredged from outside the dredge limits shall, prior to acceptance of the work, be removed to the required dredge depth. For the rest of the channel, Contractor shall dredge slideslopes to the limits shown on the Plans. Any material which sloughs into the channel and settles above the required dredge line need not be removed, however, compensation will be based on final soundings only." The mentioned paragraph further provided that the channel shall be dredged in phases and that Phase I, excluding Areas A-1 and A-2, shall be dredged first. Phase I is defined as the 1100-foot diameter Turning Circle and approximately 2100 feet of the Channel between the west end of the Turning Circle and the Phase I/Phase II interface near the American President Lines' (APL) wharf.

3. Regarding disposal, para. 1.03 B. of the Special Provisions "Scope Of Work" provided that "(a)ll mud, silts or sands shall be disposed of at the Corps of Engineers ocean disposal Site B1. The Center Point of Site B1 is located 37°31'16"N, 122°48'32"W and the site radius is 1.7 nautical miles (3.1 km)." The cited paragraph further provided that "(t)he dredged material shall be disposed of in such a way that material dredged is placed in a distinct pile or piles as directed by the Engineer." Additional requirements applicable to disposal included subpara. 3 providing that "(a)ll dredged material shall be accurately placed and piled at the Center

Point of Site B1 unless otherwise directed by the Engineer. While dumping, the barge or scow shall be stationary to ensure the material falls into a single mound."

4. Great Lakes, a New Jersey Corporation, was awarded the contract by the Port on or about April 20, 1988 (Port's Exh 32). Permit No. 17317E35, authorizing the dredging to proceed, was not, however, issued by the Corps until May 5, 1988 (C's Exh 2). The project was described in the permit as follows:

> 1. Dredge the existing lower four miles of the Oakland Inner Harbor Federal Channel from the authorized -35 feet mean lower low water (MLLW) to -38 feet MLLW plus one foot allowable overdepth;
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> 2. Transport for disposal in ocean waters at Ocean Disposal Site B1B, located at 37°29'00"N, 122°48'00"W, approximately 400,000 cubic yards (CY) of sediment dredged from the existing Oakland Inner Harbor Federal Channel;
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> 3. At the eastern terminus of the project, construct an 1,100 foot diameter turning circle dredged to a depth of -38 feet MLLW plus one foot allowable overdepth;
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> 4. Based upon review of sediment chemistry and bioassy/bioaccumulation [sic] data, the disposal of approximately 100,000 CY of material dredged from those areas within the 1,100 foot turning basin that lie outside of the existing Federal Channel, and adjacent to Schnitzer Steel to the north and the former Todd Shipyard (Alameda Gateway) to the south, shall be disposed of at either Ocean Disposal Site B1B or an approved upland disposal site. The 100,000 CY is subject to confirmatory analysis by the Technical Committee identified in Addendum to the SEIS. No dredging shall occur within those areas of the turning basin located outside of the existing Federal Channel until the location of the appropriate disposal site for the dredged material has

> been determined, and the permittee has been notified by the Corps of Engineers that dredging and disposal may proceed.

5. By a letter to Colonel Galen Yanagihara, District Engineer for the Corps, dated May 3, 1988, Regional Administrator Daniel W. McGovern concurred in the designation of a site located at 37°29'00"N, 122°48'00"W having a radius of one nautical mile, referred to as the B1B site, for the disposal of approximately 500,000 cubic yards of dredged material from the Oakland Inner Harbor (C's Exh 1). The mentioned site is approximately 11 miles west of the San Mateo County line and approximately 25 nautical miles southwest of the Golden Gate Bridge. The letter stated, however, that based on an analysis of sediment chemistry and bioassay/bioaccumulation test results that have been received to date, we cannot agree that all of the dredged material from the Oakland Inner Harbor turning basin meets EPA's ocean dumping criteria for dredged material permits. In an attachment to the letter, EPA set forth the rationale for the above determination as follows:

> As a result of our April 4, 1988 letter requesting additional information on the Oakland Inner Harbor sediments, two documents were prepared by the Corps. EPA reviewed the following documents to evaluate the suitability of the dredged material for ocean disposal: 1) "Results of Confirmatory Sediment Analyses and Solid and Suspended Particulate Phase Bioassay Tests on Selected Sediment from Oakland Inner Harbor," San Francisco, California, April 1988 (Comment Draft); and 2) Preliminary Bioaccumulation Test Results for the Oakland Inner Harbor, April 17, 1988.
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> Upon review of the above documents, EPA has determined that only dredged material from Reaches 1, 2, and 3 and the channel area of the turning

basin meets the criteria for evaluating environmental impact defined at 40 CFR 227.4. Therefore, only the above material is suitable for ocean disposal at the B1B site.

Based on the information that EPA has received to date, we cannot agree that the remainder of the dredged material from the proposed Oakland Inner Harbor turning basin is acceptable for ocean disposal. EPA has determined that this material will not meet the criteria for ocean disposal as defined at 40 CFR 227.4.

The unsuitable material is approximately 100,000 cubic yards of dredged material from the areas adjacent to Todd Shipyard and Schnitzer Steel. Chemical tests of the turning basin material above the clay layer showed significant concentrations of heavy metals and organic pollutants. Bioassay and bioaccumulation tests of the same material showed significant differences when compared to the Point Reyes reference sediments. Since sediment was not sampled below the Clay layer (to project depth) at all locations in the turning basin area, EPA has assumed that the unsampled material is similar to the upper layers that were tested. Therefore, we have determined at this time that all of the 100,000 cubic yards from the turning basin area outside the main ship channel is unsuitable for ocean disposal.

During our meetings at the Battelle Northwest Marine Laboratory in Sequim, Washington, EPA recommended that the Corps conduct additional tests on the clay layer contained in archived core samples. If these test results reveal that the material is not contaminated, the clay layer and the dredged material below this layer may be suitable for ocean disposal. We will reevaluate our decision if the Corps submits the results of the additional tests and requests further review of the suitability of this material for ocean disposal.

6. In gathering data necessary to comply with the requirements of the National Environmental Policy Act and the Ocean Dumping Regulations, the Port contracted to have water and sediment samples collected. These samples were collected in December

1987[5/] and included sediment core samples from the Oakland Inner Harbor taken from three sites near the Schnitzer Steel/Howard Terminal (north or Oakland side of the Channel), designated S1, S2 and S3, and four samples taken from sites near the Todd Shipyard (south or Alameda side of the Channel), designated as T4 through T7. There is some confusion in the record as to the identification and actual location of these sample sites.[6/] The samples referred to and others were analyzed and tested by the Pacific Northwest Laboratory (PNL), Battelle Marine Research Laboratory, Sequim, Washington, which is operated by the Battelle Memorial Institute under a

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[5/] Core samples had initially been collected in December of 1986 (GDM, note 3, supra, at 10).

[6/] The Draft Battelle Report (Port's Exh 8A, C's Exhs 27 & 29, Attachs. 1E through 1H) contains a narrative description of where Samples T4 through T7 were collected. An accompanying map, however, identifies the samples as T3 through T6. Mr. Walls, identified infra note 69, testified that the shoreline shown on the map was incorrect and that it would be very difficult to accurately plot the sampling locations [on the map] (Port's Exh 149, Vol. IV-66). Mr. Cotter, identified infra finding 36, produced a second map showing Sample No. T3 renumbered as T4, T4 renumbered as T5, etc., which he stated was a handout by Dr. Richard Lee of the Corps' Waterways Experiment Station (WES) at the first TRP meeting in March of 1988 (C's Exh 159; Vol. 12-17-78). According to Mr. Cotter, this relabeling of the samples demonstrated that the highest concentrations of heavy metals and other contaminants were in the area east of the A-2 area which was illegally dredged by Great Lakes (Id. 182-85). These maps are not identical and show the sample locations at different points. While the relabeled sample locations on Complainant's Exhibit 159 appear to more nearly comport with the narrative description of the points where the samples were collected, Mr. Walls testified that it was not possible to exactly determine the T4 and T5 sample sites, because no coordinates were given and no surveying done (Deposition Vol. IV-68).

contract with the Department of Energy (Results Of Bulk Sediment Analysis and Bioassay Testing On Selected Sediments From Oakland Inner Harbor and Alcatraz Disposal Site, San Francisco, California, 1988, Port's Exh 8A). Although accepted field sample collection, preservation and storage protocols were not followed in collecting the samples, it was concluded that sediments from Todd Shipyard have a significant enhancement in the concentration of a number of chemical contaminants compared to values at the Alcatraz Island Disposal Site (Id. at 73). Of most concern were the levels of organotins, mercury and PCBs, each of which were stated to be at levels at, near, or beyond marine water quality criteria values and also at levels that have been shown to have effects on marine organisms during water column exposure tests. Depression in the number of oyster larvae surviving elutriate exposure and increased proportions of abnormal development were reported. It was concluded that these results seem to indicate that contaminants in the sediments at Todd Shipyard can be expected to have an adverse impact on water column organisms during disposal operations. Schnitzer Steel samples did not have the same level of contamination nor did these samples have the same level of bioassay impact as observed with samples from Todd Shipyard sediments. Pointing out that there is a potential for organisms living in or near the sediment to accumulate contaminants in their tissues or to be actually affected by the sediment bound contaminants, the

report acknowledged that the effects on organisms exposed to the solid phase of the sediment bound contaminants were unknown. The report recommended that the sediments be tested with an appropriate organism and stated that, because the sediment at potential dredge sites is of such fine grain size, it may not be appropriate to use the interstitial amphipod, Rhepoxynius abronius for this purpose. This was because it is well known that this organism has a variable survival when exposed to extremely fine sediments and that more appropriate test organisms might be various species of clam.

7. On September 25, 1987, the Corps issued a notice of the availability of a Draft Supplemental Environmental Impact Statement (SEIS) for the Oakland Outer and Inner Harbors, Deep-Draft Navigation Improvements (Port's Exh 4 at 16, Appendix D at 143). A copy of the SEIS was filed with EPA on the same date. On October 20, 1987, the Corps issued a Public Notice, constituting Notice Of Intent To Use Ocean Disposal Site pursuant to MPRSA section 103. Also on October 20, 1987, the District Engineer formally requested EPA's concurrence in the designation of Ocean Dredged Material Disposal Site (ODMDS) as the site for disposal of dredged material under the project. ODMDS 1M centered at 37°38'42"N, 122°42'16"W, approximately 15.6 nautical miles from the Golden Gate Bridge, was chosen by the Corps, because water depth, 44 to 49 meters (24 to 26.8 fathoms) and currents would result in bottom impacts of the dredged material spreading over the smallest

area of any of the candidate sites (SEIS at 45). By contrast,, water depths at the B1 and B1A sites range from 79 to 90 meters (43 to 49 fathoms). Additionally, it was determined that the fishery resources of Sites 1M and B1 were essentially the same and the additional cost of transporting the material to the more distant B1 site was estimated at 15 million dollars (Id. at 47, 155). EPA, however, expressed concerns not only over the site designated, but also over the suitability of Oakland Inner Harbor sediments for ocean disposal and refused to concur.

8. In an effort to resolve these issues and expedite the project, a Technical Review Panel (TRP), composed of five representatives from the Corps and five representatives from EPA was convened. The TRP met at Fort Belvoir, Virginia on March 10 and 11, 1988, and issued its recommendations under date of March 14, 1988 (Port's Exh 2). The TRP considered the following documents: Draft Supplement I to the September 1987 Final EIS for the project; Preliminary Draft of the Battelle/Marine Research Laboratory Report (January 1988), referred to in finding 6 and Corps sediment chemistry data for 1987 operation and maintenance dredging of Oakland Harbor. The TRP concluded that material from Inner Harbor Reaches 1 and 2 and the vicinity of Station 3aa appears to be suitable for ocean disposal.[7/] It pointed out that sediment chemistry

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[7/] Reach One is identified as the entrance reach and between jetties, Reach Two as the reach adjacent to American President (continued...)

profiles have not identified significant elevations of contaminants of toxicological concern. With respect to material from Inner Harbor Stations 3cc and 3dd, however, the TRP considered the material was not suitable for open ocean disposal.[8/] Acknowledging that the results of solid phase bioassays as described in the DSEIS were equivocal, the Panel noted that supplementary tests set forth in the preliminary draft of the Battelle report, consisting of suspended solid phase bioassays on sediments from the Schnitzer and Todd areas of the Turning Basin showed significantly high toxicity to oyster larvae.[9/] This conclusion did not consider the results of initial mixing mandated by the regulations. Moreover, the endpoint specified by the "Green Book"[10/] is mortality and to the extent it relied on reported abnormal development of oyster larvae, the TRP disregarded the

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[7/](...continued)
Lines and Reach Three as the Channel Reach of the Turning Basin (Confirmatory Solid Phase Bioassay Tests, Phase I, March 18, 1988, Port's Exh 62B).

[8/] Station 3cc appears to be east of Todd Shipyard and toward the middle of the channel, while Station 3dd is adjacent to Schnitzer Steel (GDM, note 3, supra at Appendix A-30).

[9/] The Panel used the term "suspended solid phase" (SSP) to refer to "suspended particulate phase" bioassays.

[10/] Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Waters, Implementation Manual for Section 103 of Public Law 92-532 (Marine Protection Research and Sanctuaries Act of 1972, Port's Exhs 1 & 1A), hereinafter "Green Book."

regulations. Physical and chemical characteristics of these sediments were similar to those from Stations 3cc and 3dd and the Panel concluded that the comparability of the physical and chemical characteristics suggested similar levels of toxicity. Because solid phase bioassay results were not consistent among the sample locations, the Panel concluded that additional solid phase bioassay testing should be conducted to confirm its conclusion as to the acceptability of Inner Harbor material for ocean disposal. Inconsistently with its reliance on suspended particulate tests on oyster larvae for the conclusion that materials from the vicinity of Stations 3cc and 3dd were unsuitable for open ocean disposal, the Panel stated that water column testing and physical characteristics of the sediments to be dredged indicated that water column impacts are unlikely. It was therefore concluded that additional testing would be limited to benthic effects as assessed by solid phase bioassays. Solid phase testing was to be conducted on infaunal amphipods, polychaetes and deposit-feeding bivalve molluscs.

9. Regarding disposal site selection, the Panel concluded that data differentiating ODMDS B1 from Site 1M were not definitive. The TRP stated, however, that fishery interests appear to be more substantial at Site 1M than in the vicinity of B1 and concluded that the B1-B1A area has the greater potential for use for the Oakland project. The Panel recommended that the final boundary of a site in the B1-B1A

should be determined on the basis of minimizing, inter alia, interference with the Gulf of the Farallones Marine Sanctuary.

10. Thereafter, additional sampling and testing were conducted. Sediment samples were collected from 14 stations designated by the Corps, seven in the Inner Harbor Reach, designated 1-1, 1-2, 1-3, 2-1, 2-2, 3-1, and 3-2, and seven in the Turning Basin, designated SN-1, SN-2, SN-3, TD-1, TD-2, CH-1, and CH-2. As might be expected, samples designated SN were collected in the vicinity of Schnitzer Steel, samples designated TD were collected in the vicinity of Todd Shipyard and samples designated CH were collected in the Channel area of the Turning Basin.[11/] The Schnitzer and Todd samples were divided into upper and lower cores, designated as SN-2U, SN-2L, SN-3U, SN-3L, and TD-1U, TD-1L, TD-2U and TD-2L. Additionally, reference sediments were collected offshore of Point Reyes, California, which is north of San Francisco, and Sequim Bay, Washington, which is on the Olympic Peninsula, northwest of Seattle.[12/] Preliminary results of tests on

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[11/] Confirmatory Sediment Analyses and Solid and Suspended Particulate Phase Bioassays From Oakland Inner Harbor, San Francisco, California, prepared by the Battelle Marine Sciences Laboratory, hereinafter Battelle Report (C's Exh 106). Although dated December 1988, the Report includes the results of tests on additional samples collected during the period March 21 to March 27, 1988 (Id. at 2.8).

[12/] Reference sediment samples are collected from uncontaminated areas for the purpose of comparing test results on samples from the area to be dredged and are intended to be similar to sediments in the area where the dredged material is to be placed. Control sediments or samples, on the other hand, are tests

(continued...)

these samples were discussed at a meeting on April 20, 1988, at the Battelle Marine Laboratory, Sequim, Washington, attended by representatives of EPA, Region IX, the Port and the Corps (memorandum for the record, Port's Exh 63). It developed that notwithstanding the TRP had recommended that only additional solid phase bioassays be conducted, Region IX insisted that suspended particulate bioassays be conducted as well.[13/] Moreover, Region IX determined that chemical characterization of the dredged material had to be performed even though this had not been identified as an area of concern by the TRP. Furthermore, even though the Battelle Draft Report recommended that the amphipod Rhepoxynius abronius not be used for solid phase tests, because of its sensitivity to grain size (finding 6), Rhepoxynius (Rhepox) was, nevertheless, the amphipod used for this purpose.[14/]

[12/](...continued)
on sediments from the area where the test organism was collected (Wright, Vol. 17-38). The purpose of this test is to assess the general health of the organism and eliminate causes such as age, disease, stress, etc., as reasons for mortality.

[13/] Dr. Tom Dillon, a research biologist at the Waterways Experiment Station (WES), Vicksburg, Mississippi, was one of the Corps' representatives attending the meeting. He concluded that all concerns over potential toxicity in the SPP bioassays would be eliminated by mixing zone considerations (memorandum for the record, dated April 21, 1988, Port's Exh 65).

[14/] EPA's explanation for this is that the recommended amphipod, Ampelisca abdita, was not available on the West Coast. Dr. Willis E. Pequegnat, a consultant and expert witness for the Port, was skeptical that Ampelisca was not available, for he testified that it was rather abundant in "these waters" (Vol. 15-
(continued...)

11. A coordination meeting between EPA, Region IX and the Corps to further consider results of bioassay/bioaccumulation tests conducted by Battelle was held on April 27, 1988 (unsigned memorandum for the record, dated April 27, 1988, Port's Exh 69 and Fact Sheet, dated May 3, 1988, Port's Exh 72). The District presented its determination on the data in accordance with the "Green Book." Although recognizing that chemistry data reflected high contaminant concentrations, the Corps pointed out the very purpose of bioassay/bioaccumulation tests was to allow for an analysis of ecological effects. The Corps concluded that all of the material from the 38-foot dredging was acceptable for ocean disposal. Regarding the Rhepox solid phase bioassays, four stations (3-1, 3-2, SN-3L and TD-2L) were found to have statistically significant differences in toxicity when compared to Point Reyes reference sediments. It was pointed out, however, that when Rhepox results were compared with Sequim Bay reference sediments, no significant toxicity was observed. As to bioaccumulation test results, only organotins, tributyltin (TBT), and dibutyltin showed statistically significant bioaccumulation effects.[15/]

[14/](...continued)
131).

[15/] This is not strictly accurate as statistically significant bioaccumulation of lead was observed at Stations CH-1 and TD-2L and significant bioaccumulation of chrome at Station SN-3L (Battelle Report, C's Exh 106, at 4.7). The chrome bioassay, however, is not indicated as statistically significant in Table 4.1.

Because there are no standard methods for evaluating this compound and no generally accepted guidelines by which to interpret the biological importance of organotin bioaccumulation and in view of the other bioaccumulation test results, bioaccumulation was considered not to be a problem.

12. Region IX, however, adopted a different approach which emphasized sediment chemistry. Dr. Brian Melzian, Region IX Oceanographer, developed a chemical ranking system, which allocated points to the 18 core samples from the Oakland Inner Harbor collected in late March based on chemical concentrations. (C's Exh 130; Attach. to Port's Exh 69, Port's Exh 71). Under this system, Station SN-2L received the highest number of points 72 and a No. 1 (least desirable) ranking, based on alleged toxicity hits, without considering the limiting permissible concentration (LPC),[16/] to mysid, fish, oyster development and number of oysters surviving. As might be expected, other TD and SN stations also received a high number of points and a high chemical numerical ranking.

13. According to a memorandum for the record by Dr. Tom Dillon (note 13, supra) and Dr. Thomas Wright, an ecologist at WES (Port's Exh 74), attendees at the meeting, Dr. Melzian claimed to have the support of Office of Research & Development (ORD)

[16/] The limiting permissible concentration is a method of calculating (estimating) the effects of initial mixing during a period ending four hours after disposal, by constructing a time-concentration mortality curve from bioassay data which is compared graphically to the time-concentration relationship for dilution ("Green Book" at para. 30; Appendix H).

and Office Marine and Estuarine Protection (OMEP), EPA Headquarters, for the above. In support of this claim, a memorandum, labeled "Draft" and dated 4/27/88, purportedly written by Dr. John H. Gentile, of EPA's Woods Hole Oceanographic Institution and William C. Muir, Region III Oceanographer, but initialed only by Dr. Gentile, was produced.[17/] The memo states in pertinent part:

> When viewed in its totality, the biological test data for both the suspended and solid phase tests and the chemical contaminant profiles support the initial findings of the Panel. Specifically, there are demonstrable differences in the magnitude of chemical contamination and toxic response of sensitive species to sediments collected from stations designated TD and SN (both upper and lower horizons) when compared with similar analyses from other stations.

The memorandum pointed out that oyster larvae, Sand Dab and Mysids showed a significant increase in mortality at the 100% treatment in samples taken from TD-2L and SN-2L. Only the oyster larvae showed a significant decrease in abundance and percent normal to the sediment from the upper horizons (TD-2U and SN-2U) from these stations. Acknowledging that the latter data are typically used to calculate an LPC for use in defining a mixing zone, the memo stated that the data

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[17/] Attachment to Port's Exh 69. While it is not clear that Mr. Muir authorized his name to be placed on this memo, Dr. Melzian's notes of telephone conversations of April 29 and May 2, 1988, indicate that Mr. Muir would not agree that open ocean disposal of the material was appropriate and that he and Dr. Gentile agreed with the Region's analysis [of the Battelle data] (Melzian Record Book, Port's Exh 97).

indicates that the material is potentially toxic. In support of this assertion, solid phase tests on the amphipod Grandidierella japonica were cited which allegedly showed 55% mortality at SN-2L and SN-3L, 47% mortality at TD-1L and SN-3U and 33% mortality at TD-1U and TD-2U.[18/] Rhepox assertedly showed a similar pattern of response. The memorandum stated that the magnitude of chemical contamination based upon inorganic (Hg, Cu, Pb, Ag, etc.) and organic (TBT, PAHs, Pthalates and PCBs) chemical analyses was consistently elevated in the TN[TD] and SN samples and that these concentrations, while precluding disposal in the ocean, were within the limits for a sanitary landfill.[19/]

[18/] Because Point Reyes and Sequim Bay reference sediments also showed low survival rates for this organism, the results were considered spurious and inappropriate for estimating sediment toxicity (Battelle Report at 3.29).

[19/] The memorandum reiterated that materials delineated by Stations TN[TD] and SN were not suitable for ocean disposal and thus required immediate consideration of alternative disposal methods. It pointed out that mitigation techniques, such as capping, while suitable for shallow-water (30 to 40 meters) disposal sites, had not been demonstrated for deeper sites (the B-1 site approaches 300' in depth) such as those proposed for Oakland Harbor material. Moreover, the memorandum stated that continued delay in evaluating and selecting alternative disposal options could jeopardize the project and that, while this may appear as a possible way to favorably leverage the ocean disposal option, it was environmentally and politically unacceptable. This is an example of individuals, trained in scientific matters, venturing into the policy and political arena where they have no delegated authority and no demonstrated special competence. Nevertheless, it takes a confident decision-maker to disregard such "scientific" advice.

14. These conclusions were vigorously disputed in the Dillon/Wright memorandum for the record, dated May 6, 1988, referred to in finding 13. Battelle data evaluated reportedly consisted of four components: physical/chemical analyses, suspended solid phase (SSP) acute toxicity bioassays, solid phase (SP) acute toxicity bioassays, and bioaccumulation bioassays. Regarding physical/chemical analyses, the memorandum noted that the Point Reyes reference was 5.44% silt-clay, while the project samples were 62 to 90% silt-clay and the Sequim Bay reference was 72% silt-clay. Chemical concentrations in the project samples were higher than in the Sequim Bay reference[20/] and in general there were higher concentrations in the Todd and Schnitzer samples than in the Channel. Regarding the three organisms (a mysid shrimp, a juvenile flatfish and oyster larvae) used in SSP acute toxicity bioassays, the memo noted that survival was generally high and that only in the case of the oyster larvae was it possible to calculate an EC_{50}.[21/] After considering initial mixing as required by the ocean dumping regulations, concern over unacceptable adverse effects was eliminated and

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[20/] This statement is seemingly equally applicable to comparisons with Point Reyes reference sediments.

[21/] An LC_{50} is that concentration which results in mortality to 50% of the organisms, and an EC_{50} is that concentration which results in inhibition of 50% of the organisms. An LC_{50} may only be calculated when 50% or greater mortality actually occurs in the highest concentration of the test medium ("Green Book," Appendix D at 13-14).

Drs. Wright and Dillon concluded that the material would not have unacceptable adverse effects on water column organisms. As to SP acute toxicity bioassays, the memo stated that the only statistically significant mortalities, which were more than 10% over the Point Reyes reference, occurred with Rhepox at Stations 3-1, 3-2, SN-3L and TD-2L. Statistically significant mortality began at 25% and ranged to 31%. No statistically significant differences occurred when the data was compared to Sequim Bay and Drs. Wright and Dillon concluded that Rhepox was responding primarily to grain-size differences rather than contaminants. They pointed out that this organism normally inhabits sandy sediments such as Point Reyes and poorly tolerates silty sediments such as the project material and Sequim Bay reference. Moreover, the statistical significance as compared to Point Reyes at two (3-1, SN-3L) of the four stations largely resulted from poor survival in one replicate at each station. Accordingly, they concluded that the results of the SP bioassays demonstrated that unacceptable adverse effects upon benthic organisms would not result from ocean disposal of the project material.

15. The deposit-feeding clam (Macoma nasuta), used for SP acute toxicity bioassays, was also used to evaluate bioaccumulation and Drs. Wright and Dillon observed that bioaccumulation was generally low. Data on metals was reportedly incomplete with only single values for mercury, chromium and lead. None of the values were considered to be appreciably elevated over the

Point Reyes or Sequim Bay references. The memo noted that prior analyses of project sediments did not indicate a problem with metals.[22/] While there was statistically significant bioaccumulation of organotins in clams at three stations relative to Point Reyes, they noted that there were neither generally accepted analytical techniques nor interpretative guidance as to the effect of such bioaccumulation. Drs. Wright and Dillon evaluated the material in accordance with 40 CFR Parts 220-228, 33 CFR Parts 335-338 and the "Green Book." In view of the lack of toxicity in the SSP and SP acute toxicity bioassays and the absence of substantial potential for bioaccumulation, they concluded that the material was acceptable for ocean disposal.

16. EPA, Region IX, however, adhered to its position (finding 12) that the material from the Turning Basin was unacceptable for ocean disposal. This position was maintained in the face of Corps assertions that the chemical ranking system presented by Dr. Melzian had no applicability in determining the suitability of the material for ocean disposal in accordance with the ocean dumping regulations, that the "toxicity hits" identified by the Region were factored in without the use of mixing considerations mandated by the regulations, including

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[22/] There is evidence that an order of magnitude over reference levels is normally used in risk assessments to evaluate potential impacts (GDM, Appendix A, at A-13-14). Moreover, the cited reference states that none of the bioaccumulation levels approach FDA action limits. This reference is apparently to test results on samples collected in December 1987 (finding 6).

the "Green Book" and that the amphipod data involving the Point Reyes reference were hits apparently due to grain size effects.[23/] According to the Dillon/Wright memo, the Region questioned whether the "Green Book" was adequate for the evaluation of sediment for ocean disposal and contended that EPA had the authority to take a more "holistic" approach and place major emphasis on sediment chemistry. Because the Region and the District were unable to reach agreement on the acceptability of the material for ocean disposal, a second TRP was convened.

17. The second TRP was composed of nine individuals, five representatives from EPA and four representing the Corps.[24/] The Panel met in Washington, DC on May 11, 1988, considered

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[23/] Dillon/Wright memo at 3. The memo states that as far as the authors are aware, the only instance of a numerical prohibition [on ocean disposal] involves PCBs at concentrations of 50 mg/kg (ppm) or more under TSCA. Noting that Annex II of the LDC (London Dumping Convention) establishes levels of 1,000 mg/kg for As, Cu, Fl, Zn, cyanide and organosilicons and 500 mg/kg for Pb (lead) and non-chlorinated pesticides in sediments, the memo emphasizes that these are not limits and do not prohibit ocean disposal.

[24/] Memorandum, bearing a handwritten date of June 30, 1988, Subject: Oakland Harbor Technical Review Panel Recommendations Based on Additional Sampling of Oakland Harbor, hereinafter TRP Recommendations (Great Lakes' Exh 1). One of the six attendees from EPA, Mr. Dave Redford, was an observer and not a member of the TRP (Wright, Vol. 17-87). EPA representatives included William Muir and Dr. John Gentile, who had already concluded that the disputed material was unacceptable for ocean disposal (finding 13). It should be noted that when, at the meeting in Sequim on April 20, 1988, Corps representatives inquired as to the decision-making process, they were informed that the Regional Administrator would be advised by Region IX staff, Jack Gentile, Rick Schwartz [Swartz] (EPA, Newport, Oregon Lab), Bill Muir, Region III and Loretta Barsamian (Port's Exh 63).

the results of tests on additional samples collected in March 1988, as reported by Battelle and, in contrast to the alacrity by which the first Panel report was issued, did not issue its recommendations until mid-June 1988.[25/] While noting that additional SSP tests had not been requested by the Panel, the Panel also noted that, using a method to calculate the LPC supplied by the Corps (Port's Exh 26), the LPC would easily be met within the mixing zone.[26/] Nevertheless, the TRP states it was agreed that the existence of statistically significant differences between tests and controls at some stations may be taken into consideration in reviewing other parts of the data, where such information might provide insights into the relationships between water column effects and overall environmental impacts. As to SP bioassays, the Panel noted that four instances of statistically significant differences between Rhepox in tests of project material and reference sites were found. These were in lower depths at Stations SN-3L and TD-2L and in the Channel downstream [west] of these

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[25/] Although the TRP recommendations bear a handwritten date of June 30, 1988 (note 24, supra), and apparently were not officially issued until June 22, 1988, a copy was faxed to the Region as early as June 15, 1988 (Port's Exh 117).

[26/] This is not surprising because the "Green Book," while containing a hypothetical instance where the LPC would not be met, points out that a situation as severe as the illustration, both in terms of high mortality and low dilution, has never been documented for either the liquid or suspended particulate phase of dredged material (Id. at D20).

locations, i.e., 3-1 and 3-2.[27] The question of whether the results could be biased by differences in grain size had assertedly been raised at the previous Panel meeting.[28] The Panel stated that recent research, currently in press, indicates that there is a slight response of Rhepox to grain size,[29] but that the magnitude of this response is not precisely known at this time. As to bioaccumulation, the Panel noted that the only statistically significant substance

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[27] The map showing Inner Harbor Sampling Stations attached to the TRP Recommendations, however, shows two sampling stations designated 3-2 and no station designated 3-1.

[28] Although the first TRP report does not refer to grain size, the Dillion/Wright memorandum of May 6 (Dr. Wright was a member of both TRPs) states that the poor tolerance of Rhepox to silty sediments was the major reason the recent TRP recommended against the use of this organism in confirmatory bioassays. This statement is supported by the Confirmatory Solid Phase Bioassay Tests, Phase I, March 18, 1988 (Port's Exhs 11 and 62B), drafted by Region IX and the San Francisco District of the Corps (Wright, Vol. 17-27), which sets forth the number of samples to be collected for additional SP testing in the three reaches of the Oakland Inner Harbor, organisms to be used for tests, etc. The crustacean specified is Ampelisca.

[29] This appears at a minimum to be a gross understatement. The research referred to, "Effects Of Natural Sediment Features On Survival Of The Phoxocephalid Amphipod, Rhepoxinius abronious," in press (C's Exh 52, Port's Exh 128), states in the Abstract "(v)ery fine sediments, in the silt-clay range, decreased amphipod survival by up to 57% relative to survival in coarser sediments." Dr. Gentile, an EPA TRP member, had a copy of the draft paper (Muir, Vol. 6-180, 182-83, 184). Mr. Muir opined that the graphic [regression analysis] in the paper did not show a conclusive relationship between grain size and Rhepox survival (emphasis supplied). Authors of this paper are Theodore H. DeWitt of Oregon State University and George R. Ditsworth and Richard C. Swartz of EPA's Newport, Oregon Laboratory. Drs. DeWitt and Swartz are referred to infra (finding 70).

of concern was tributyltin (TBT). Although insufficient data were currently available to determine the toxic effects of TBT at the concentrations found, the Panel reportedly agreed that the bioaccumulation results gave cause for concern over the potential effect of TBT on benthic organisms as a result of ocean dumping.[30/]

18. In its conclusions, the Panel reportedly agreed that the new test results confirmed previous conclusions that the material in the Inner Harbor, except for some of that nearing the turning basin, was suitable for unrestricted ocean disposal. Limited data available from the additional coring work suggested that the area of the Todd Shipyard was underlain by a high-compacted stratum of undisturbed clay, which the Panel considered to be uncontaminated. Acknowledging that the additional solid phase bioassay and bioaccumulation test results from samples taken near the Schnitzer Steel Plant and Todd Shipyard were not by themselves clearly indicative of highly contaminated sediments that should be prohibited from ocean disposal, the Panel reportedly agreed that these results taken in combination with other data from these stations indicated that there was cause for concern over the possible

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[30/] The phrase "cause for concern" is used several times in the discussion portion of the TRP Recommendations. It states a truism in the sense that any ocean disposal is a cause for environmental concern. It is equally clear, however, that "cause for concern" is not a legal standard and has no support in the regulations as a means of determining the suitability of dredged material for ocean disposal.

behavior of these sediments, if dumped in the ocean in an unrestricted manner. By "unrestricted manner," the Panel meant "capping" or some other means of mitigating potential toxic effects.[31/] It acknowledged, however, that there were no data at present to demonstrate the feasibility of restricted ocean dumping at any of the proposed disposal sites. The TRP conclusions were as follows:

> 1. The volume of material represented by station SN-3 and all of the material represented by the TD stations from the surface of the sediment down to the line of undisturbed clay is considered unsuitable for unrestricted ocean disposal.
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> 2. The remaining material from the Inner Harbor may be considered as suitable for unrestricted ocean disposal.[32/]

19. A memorandum for the record, dated May 12, 1988, signed by Dr. Thomas Wright (finding 13, supra) and Dr. Robert M. Engler, Manager, Environmental Effects of Dredging Programs, both of whom represented the Corps on the TRP, describes the

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[31/] "Capping" is the practice of covering contaminated material with uncontaminated or material of lesser contamination for the purpose of sealing in toxicants and preventing the release of toxicants to the environment.

[32/] The TRP Recommendations were officially distributed by a memorandum bearing EPA letterhead signed by Tudor Davies, Director of OMEP for EPA and by David B. Mathis for Charles S. Hummer, Director of the Dredging Division for the Corps. Mr. Hummer and Mr. Mathis were members of the Panel representing the Corps. The Panel recommendations were written by John Lishman, an EPA attorney, and Mr. T. A. "Al" Wastler, a senior science advisor in OMEP, both of whom represented EPA on the Panel (Muir, Vol. 7-71, Wright, Vol. 17-78, 79, 92, 108). Mr. Muir testified that, while a consensus was reached, no votes were taken at the TRP meeting.

disputed material as consisting of approximately 100,000 cubic yards from the Turning Basin (Port's Exh 75). According to the memorandum, the Panel concluded that approximately 70,000 cubic yards of the material in contention were suitable for unrestricted ocean disposal. The remaining 30,000 cubic yards, consisting of material represented by Schnitzer Station 3 and that material above the clay layer at all of the Todd stations, were found to be unsuitable for unrestricted ocean disposal. In reaching this conclusion, the TRP reportedly recognized that a mere chemical-based approach was unacceptable and relied heavily on biological data and other information. The memorandum states that it was agreed there were potential problems with the material at Schnitzer Station 3 and the Todd stations. While these were not sufficiently great as to prohibit ocean disposal, in the light of uncertainties associated with interpretations of the data and other considerations, an environmentally conservative approach was warranted. Thus, the material was found to be unsuitable for unrestricted ocean disposal.[33/] Because Dr. Wright appeared as a witness at the hearing and emphatically affirmed his opinion that all of the material was suitable for ocean

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[33/] Under the ocean dumping regulations material is either suitable for ocean disposal or it is not, and there is no category "restricted ocean disposal." Although Mr. Muir referred to restrictions on rates of discharges, volumes, times of discharge, contaminant concentrations, etc., that could be imposed by the Regional Administrator (Vol. 7-56, 67), these limitations may be imposed as part of a site designation, 40 CFR § 228.8. The restriction apparently contemplated by the TRP was "capping."

disposal under the regulations, this memorandum is considered to be an attempt to record what the Panel did, rather than an agreement with its recommendations.

20. Dr. Brian Melzian (finding 12) agreed with the TRP recommendations, with the exception of sediments from Station SN-2, which he considered unsuitable for unrestricted ocean disposal.[34/] He based this opinion on the fact that, comparing sediment chemical concentrations from all Oakland Inner Harbor stations sampled, Station SN-2 had the highest concentrations for the greatest number of chemicals measured. He pointed out that of 23 chemicals found at Station SN-2, only one (selenium) had as high a concentration at SN-3 as at SN-2. He further noted that seven of these 23 chemicals were known or suspected human or animal carcinogens and that 15 have a strong potential for bioaccumulation in marine organisms. Referring to the literature and San Francisco and Pudget Sound sediment chemistry and bioassay results, he stated that sediments at SN-2 were potentially more toxic than those found at SN-3. He based this opinion in part on the fact that six chemicals at SN-2 exceeded the recently

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[34/] Memorandum, dated June 16, 1988, from Brian D. Melzian, Regional Oceanographer, to Janet Hashimoto, Chief Oceans and Estuaries Section and Loretta Barsamian, Chief Wetlands, Oceans and Estuaries Branch, Subject: Review of the EPA/COE panel's report (sic) entitled "Oakland Harbor: Technical Review Panel Recommendations Based on Additional Sampling of Oakland Inner Harbor" (6/15/88) (Port's Exh 109).

determined "apparent effects threshold" (AET) values.[35/] He observed that the "hit" found at SN-3L may have been due to an anomalously low value for Replicate E. In summary, he pointed out that the deeper sediments at SN-2 and SN-3 were more "toxic" than the upper layers, that only sediments found at SN-3 (lower) indicated statistically significant mortality and that SPP tests indicated that sediments from SN-2 were acutely toxic to mysid shrimp, oyster larvae and possibly fish without consideration of LPC. He therefore concluded that sediments at SN-3 are not much, if any, more toxic than sediments at SN-2 and that it may be tenuous at best to conclude, based on

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[35/] AET values are sediment chemistry concentrations above which significant sediment toxicity is always expected. There are conceptual problems with AETs in that it is not clear whether an AET is the concentration above which effects always occurred or the concentration at which no effects occurred, which can be substantially below the next higher concentration at which effects were observed ("Draft Review of Commencement Bay Remedial Investigation, Task 3 - Apparent Effects Threshold [AET]" by Battelle Ocean Sciences, January 20, 1989, at 14, 38, Port's Exh 88). AETs have not been approved as a basis for making regulatory decisions and it is unlikely that they will be in the near future because, inter alia, ". . . AETs do not demonstrate that the particular contaminant is the primary, or even a contributing cause of the response observed" (Id. at 5). See also the letter from the U.S. ACE, Director of Civil Works, to EPA's Science Advisory Board, dated February 2, 1989 (Port's Exh 89), which enclosed Technical Review Comments, emphasizing the above and other deficiencies in the use of AETs to determine sediment quality. Moreover, Dr. Pequegnat, identified supra at note 14, testified that AET's had predicted impacts where none were shown by biological sampling [testing] and that it would be injudicious to use AET's in a regulatory sense without adequate field verification (Vol. 14-154, 158-59, 164-66).

Rhepox tests that sediments at SN-3 are more toxic than sediments from SN-2.[36/]

21. As indicated (supra at note 3), Dr. Melzian was deposed prior to the hearing by agreement of the parties. Dr. Melzian's deposition (C's Exh 103) was reviewed and critiqued by Dr. Thomas Wright (finding 13). Dr. Wright's comments were furnished to Dr. Tudor Davies, Director, OMEP, by a letter from the Corps signed by Mr. Charles Hummer, Director,

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[36/] Dr. Melzian was, of course, attempting to demonstrate that SN-2 was at least as highly contaminated as SN-3, which the TRP had agreed was unsuitable for ocean disposal. He seemed to be unaware that his argument could as easily be construed as supporting a determination that SN-3 sediments were also suitable for ocean disposal. To quote Mr. T. A. Wastler (note 32, supra), a member of the TRP:

> (3) The ranking of chemicals in toxicity has no basis in scientific work except in very strictly defined situations of known characteristics. As applied in Melzian's discussion, the ranking approach is pure nonsense and has no scientific basis for any application. This is obviously a contrived listing and clearly reveals Mr. Melzian's lack of training and experience.
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> (4) One could go through the same type of analysis with slightly different assumptions and demonstrate clearly that either all the stations were highly contaminated or none were. Even Melzian gets confused in his own analysis. At the top of page 2 he says "sediments found at Station SN-2 are potentially more toxic than those found at Station SN-3." At the bottom of page 2 he says "sediments found at Station SN-3 are not much more (if any) toxic than sediments found at SN-2." In one place they are different and in the other they are similar. Which is it?

(Memorandum, dated August 31, 1988, Subject: Comments on "new" Information Received from Region IX in Regard to Oakland Harbor, Port's Exh 129).

Dredging Division, dated March 9, 1989 (Port's Exh 130). The letter referred to Dr. Melzian's memorandum (supra at note 34) and, inter alia, expressed concern over what was characterized as the Region's clear intent to rely heavily on sediment chemistry values for oversight on future federal dredging projects. Dr. Wright reviewed the requirements of the regulations, emphasizing that the basic intent was that no environmentally unacceptable effects result from the disposal of dredged material.[37/] He pointed out that section 227.6 provides that certain substances are prohibited from disposal in other than "trace contaminants" and that the regulation proceeds to define trace contaminants in terms of bioavailability and water quality criteria. He asserted that it was clear from the Act and the discussion (preamble) of the regulation (42 Fed. Reg. 2162 et seq., January 11, 1977) that an effects based approach, especially for SPPs and SPs, is used for the evaluation of dredged material whereby biological procedures, rather than any form of bulk chemical analysis, provides the required information as to potential impacts on the marine ecosystem.

[37/] Although Dr. Wright stated that the key words were "environmentally unacceptable," citing 40 CFR § 227.13, the cited section is phrased in terms of material environmentally acceptable for ocean disposal and the quoted words do not appear therein. The phrase "unacceptable environmental effect(s)" appears in § 227.4 and the phase "unacceptable environmental impact" appears in the "Green Book," "Introduction" at 8.

22. With above concepts in mind, Dr. Wright proceeded with an evaluation of Dr. Melzian's position as revealed by Melzian's deposition. Regarding Dr. Melzian's reference to developmental abnormalities in oyster larvae (deposition at 35), Dr. Wright stated that this is not normally a regulatory consideration, because the only current procedures where death is not the end-point are bioaccuulation evaluations. As to Dr. Melzian's reference to the Regional Water Quality Control Board and the development of various protocols (Deposition at 53, 54), Dr. Wright noted that these were inapplicable as the references applied to the Clean Water Act rather than MPRSA. Dr. Wright pointed out that Dr. Melzian's reference to an EPA Water Quality Advisory for TBT being violated (Deposition at 96) was just that, an advisory, because a quantitative relationship between the concentration of TBT in the sediment and that in the water has not been established. Dr. Melzian's comparisons of chemical concentrations in Oakland Harbor sediments with those at other locations, e.g., Hunter's Point, Treasure Island (Deposition at 148) were characterized as irrelevant and technically invalid by Dr. Wright. He disputed Dr. Melzian's implication (Deposition at 153-54) that Region V used numerical sediment criteria to determine suitability for ocean disposal, pointing out that these numbers (concentrations) were used simply as a screen, in accordance with the regulation, to determine if biological tests are needed. Dr. Wright asserted that regulatory decisions

concerning the suitability of material for ocean disposal were not made on the basis of chemical concentrations and comparisons and that Dr. Melzian's repeated inferences that there was a quantitative relationship between chemical concentrations and biological effects were not accurate. Dr. Wright concluded that Dr. Melzian's position, as stated previously (findings 12, 16 and 20) and as shown by his deposition, is clearly outside the applicable regulations.[38/] He asserted that Dr. Melzian was either ignoring the regulations or simply did not understand them. Dr. Wright was of the opinion that evaluation of Oakland project material by WES, the San Francisco District of the Corps and the two meetings of the TRP was in full compliance with the letter and intent of the applicable regulations.[39/]

23. By a letter to the Regional Administrator, dated June 30, 1988, the District Engineer amended his determination of dredged material acceptable for ocean disposal in accordance with the TRP recommendations.[40/] The letter pointed out that

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[38/] Dr. Wright's conclusions in this regard are supported by Mr. Wastler's memorandum (supra at note 36) and by discussions of the TRP (Wright, Vol. 17-94, 95).

[39/] This is inaccurate to the extent the first TRP relied on SPP tests without calculating an LPC for the conclusion some of the material was unsuitable for ocean disposal and to the extent the second TRP relied on such data to support its conclusions.

[40/] Port's Exh 17. The District Engineer enclosed the results of additional bioassay testing and formally requested the Regional Administrator's concurrence in disposal of the dredged material at

(continued...)

material of concern, identified by the TRP, was found in the area represented by sample SN-3, adjacent to Schnitzer Steel Company, and in the area adjacent to the former Todd Shipyard to approximately 33 feet, MLLW. The letter stated that all other material for the initial 38-foot dredging had been determined to be acceptable for unrestricted ocean disposal and concluded that approximately 30,000 cubic yards of material from the two mentioned areas would not be disposed of at site B1B. The Regional Administrator responded to this determination by a letter to the District Engineer, dated August 4, 1988 (Port's Exh 18), which stated that the Region agreed with most of the TRP recommendations. The Regional Administrator revised his concurrence letter of May 3, 1988 (finding 5), to the extent that material below the clay layer represented by the Todd stations was suitable for ocean disposal. The letter stated that Region staff had reviewed the recently submitted results of sediment chemistry and bioassay tests for the Oakland Project along with previously submitted data and information and that this data and information had been used to make an independent assessment of

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40/(...continued)
Site B1B by a letter, dated April 27, 1988. When this letter (Port's proposed Exh 68) was offered at the hearing, EPA counsel objected upon the ground no such letter had been received by EPA. The objection lacked merit, however, and should have been overruled, because the opening sentence of the RA's concurrence letter, dated May 3, 1988 (C's Exh 1), refers to the District Engineer's request for concurrence by letter, dated April 27, 1988. The letter is admitted into evidence.

the suitability of the material for ocean disposal under EPA's Ocean Dumping Regulations.[41/] While concurring in the TRP recommendations that all material in the vicinity of Station SN-3 and that above the clay layer at the Todd stations was unsuitable for ocean disposal, the Regional Administrator stated that material in the vicinity of Station SN-2 was also unacceptable for open ocean disposal. The rationale for this determination was set forth in language which could have been lifted from Dr. Melzian's memorandum of June 16, 1988 (note 34, supra):

> Our re-evaluation of the data presented for station SN-2 reaffirmed our conclusion that these sediments are unsuitable for open ocean disposal. Station SN-2 had the highest concentrations for the greatest number of chemicals measured as compared to all other stations, including station SN-3. Many of the chemicals found at SN-2 have a strong potential for bioaccumulation in marine organisms. Without consideration of the limiting permissible concentration, the suspended particulate phase tests indicated that sediments in the vicinity of station SN-2 are acutely toxic. In addition, analysis of the scientific literature and numerous sediment chemistry and sediment bioassay test results indicated that the sediments found in the vicinity of station SN-2 are potentially more toxic than those found at station SN-3. Based on the combination of all of the above findings, we have concluded that sediments in

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[41/] Although 40 CFR § 225.2(c) does provide that the Regional Administrator will, using information furnished by the District Engineer and any other information available to him, make an independent evaluation of the proposed dumping, any such evaluation must be in accordance with the "criteria" established pursuant to section 102 of MPRSA. The "criteria" for ocean disposal consist of 40 CFR Parts 227 and 228.

the vicinity of station SN-2 are unsuitable for open ocean disposal.

24. Thereafter, the Division Engineer wrote to the RA expressing concern over the latter's position not to abide by the joint Corps-EPA testing guidelines and regulations, currently in effect (letter, from General John F. Sobke to Regional Administrator Daniel McGovern, dated August 31, 1988, 1988, Port's Exh 82). Among other things, the letter expressed the Corps' disagreement with the Administrator's determination as outlined in the letter, dated August 4, 1988. By letter, dated September 30, 1988, the District Engineer furnished further comments on the Administrator's August 4 determination. It pointed out that the chemicals alleged to have a strong potential for bioaccumulation should have been identified and that, even though current regulations use biological assessments to determine suitability for ocean disposal, the August 4 letter indicates that a simple chemical assessment would have been adequate for that purpose from the Region's perspective. It was also pointed out that the lack of consideration of the LPC was contrary to EPA regulations (40 CFR § 227.29) and stated the Corps' understanding that the LPC concept would not be eliminated from the regulation in the near future. Additionally, the Corps noted that existing regulations do not refer to any appropriate sediment-chemical/biological analysis and that Corps investigations into relationships between sediment chemistry and biological effects have demonstrated no direct association. Furthermore,

there was no documentation of the so-called "scientific analysis" of the literature and no literature enclosed with the August 4 letter to make modification of the TRP recommendations plausible. The comments included the statement that, after "scoping" with Region IX staff, approximately $300,000 was invested in confirmatory bioassay/bioaccumulation tests involving the material to be dredged from the Inner Harbor and that these tests indicated the materials from SN-2 were suitable for ocean disposal.

25. As noted previously (finding 4), the Corps did not issue the permit (C's Exh 2) authorizing dredging to commence until May 5, 1988. Copies of the permit were furnished to Great Lakes by a letter from the Port, dated May 5, 1988 (Port's Exh 25), which was apparently hand carried. Great Lakes was informed that it must familiarize itself with the permit and adhere to its terms. By a speed letter, also dated May 5, 1988, signed by Ted Mankowski, resident engineer for the Port, Great Lakes was directed to move its dump scows to the site immediately and commence dredging as soon as possible (Port's Exh 28). Great Lakes was requested to commence dredging in the Federal Channel adjacent to Area A-1 on the Schnitzer side of the Channel and informed that dredging may not yet commence in Areas A-1 and A-2 as described on page 1-a of the permit. Great Lakes began dredging in the early afternoon of May 6. After dredging had continued for an hour or more, it was

halted by a TRO issued by a federal court.[42/] Dredging resumed on May 12, 1988 (Inspector's Daily Report No. 54201, dated May 12, 1988, hereinafter Daily Report, C's Exh 8). Mr. Mankowski ordered Jim Duffy, Great Lakes' dredge superintendent, to work toward the Alameda or south side of the Channel, to stay away from the contaminated area, but to push the Channel line by overdredging, if necessary.[43/]

26. Designation of site B1B as the disposal site for material dredged from the Oakland Inner Harbor and the fisherman's efforts to halt the dumping resulted in an immense amount of publicity and media attention (Barsamian, Vol. 2-18). Notwithstanding their failure to halt the dumping by legal action, the fishermen threatened to stop the dumping by blockading the tug and trying to prevent it from reaching the B1B site (Mankowski, Vol. 11-173; Duffy, Vol. 24-27). Great

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[42/] A group of fishermen opposed disposal at the B1B site and sued to enjoin the dredging upon the ground the EIS was inadequate. A federal district court denied an injunction and the TRO was apparently issued by the Circuit Court of Appeals. After approximately one week, the injunction was lifted. See Half Moon Bay Fishermen's Marketing Association v. Frank Carlucci, et al., 847 F.2d 1389 (9th Cir. 1988), as amended 857 F.2d 505. Interestingly, Mr. Mankowski predicted that if the B1B site were selected, the fishermen would probably seek a TRO, which would take a week to lift (Inspector's Daily Report No. 54774, dated April 27, 1988, hereinafter Insp.'s Rpt., Port's Exh 99).

[43/] Vol. 20-196-97; Daily Report No. 54201, dated May 14, 1988. It should be noted that the contract provided for removal of material sloughing into the area to be dredged from outside the dredge limits at the Turning Circle or Basin and that, for the rest of the Channel, removal of material sloughing into the Channel above the required dredge line was optional, except that payment would be based on final soundings (finding 2).

Lakes used two scows (Nos. 34 and 35) to transport the dredged material to the disposal site.[44/] The first scow (No. 35) was filled at approximately 7:00 p.m. on May 12 and left the dredge site under tow by the tug "Hunter D" at approximately 7:35 p.m. (Daily Report No. 54205). The tug was trailed or shadowed at the instance of the fisherman and other fisherman informed of its location. Approximately 18 fishing boats attempted to cut-the-tug-off by maneuvering as close as possible without actually striking it,[45/] shouting obscenities, throwing eggs, shining lights into the pilothouse and attempting to foul the propellers of the tug by throwing a fishing net, estimated by Mr. Mankowski to be 300' in length, in front of it.[46/] Mr. Earl Cole, the captain of the tug, however, invoked a Coast Guard rule to the effect that a power driven vessel shall give way to a vessel restricted in her ability to maneuver, and maintained a steady speed and course. Navigation to the disposal site was to be aided by a Del Norte electronic positioning system (EPS) which utilizes

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[44/] The scows or barges are over 230 feet in length and, when loaded, contain up to 4,000 cubic yards of material.

[45/] Mr. Mankowski, who was aboard the Hunter D, testified that some of the fishermen's boats were so close, their booms or outriggers extended over the gunwale of the tug (Vol. 11-185).

[46/] An account of this incident from the fishermen's perspective appeared in the Oakland Tribune on May 14, 1988 (Port's Exh 105). Additionally, Mr. Mankowski had a video camera and a tape of the film taken was viewed at the hearing (Port's Exh 15).

transponders at shore stations to determine the position of the tug. In this instance, however, the transponder at Mt. Tamalpais was not working and the determination that the center of disposal site had been reached was made by the use of LORAN-C.[47/] The dump was completed before 2:00 a.m. on the morning of May 13, 1988 (Daily Report No. 54205, Inspector's Report. No. 54789). The distance from the tug to the scow at the time of the dump, was reported to be 596 feet.[48/]

27. When the "Hunter D" returned to port, the screws (propellers), shafts and rudders were fouled by a fishing net or nets, requiring the use of divers to remove the obstruction. This was potentially the most dangerous of the fishermen's efforts to stop the dumping, because, if the tug had lost power, it might have been overridden or rammed and sunk by the much larger and heavier scow (Great Lakes' Exh 14). Although an

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[47/] LORAN is an acronym which stands for long range navigation (Commander Page Shaw, U.S. CG, Vol. 13-2, 3). The system uses shore based transmitters to transmit signals which can be picked up at sea. The system is available to anyone having a LORAN-C receiver and has a minimum accuracy of one-quarter of a nautical mile. With repeated runs to a particular site, Commander Shaw indicated the accuracy could be increased to 200 meters (Vol. 13-25).

[48/] Quality Assurance/Quality Control Log Sheet (C's Exh 9). This is determined by means of an Omni Total Station System in the stern of the tug which focuses on prisms in the bow of the scow. In heavy seas, the distance from the tug to the scow may be maintained at as much as 1,500 feet. Indeed, the second and third dumps and the fourth attempted dump were made when the scow was 1500 feet from the tug (Id.). Dump Nos. five and six were made when the scow was 1026 feet from the tug.

estimated 100 fishing boats were in the area, 12 of which were in the B1B dump site, at the time Load No. 6 was dumped (Daily Report No. 54216, May 15, 1988), the fishermen apparently made no further efforts to obstruct or blockade the towing of scows to the disposal site.

28. Mr. Duffy replaced the transponder at Mt. Tamalpais. Difficulties were, however, experienced with the operation of the computer system on the second trip to the disposal site. This was due in part to the fact that the Great Lakes' employee, Mr. Greg McAffee, hired to operate the computer system became seasick.[49/] Accordingly, the second dump was made relying in part on raw "EPS" data without the assistance of a computer. Mr. Hilgendorf (finding 30, infra) testified that this would not have been a problem, if he had been called earlier (Vol. 11-21). The third scow load was transported to the disposal site without incident. The fourth load (Scow No. 35) left the dredge site at 3:15 p.m. on Saturday, May 14, showing a draft of 15.8' forward and 15.9' aft (Daily Report No. 54212). An attempt to dump the load was made at 8:30 p.m., which was unsuccessful, as the scow doors would not open. After circling the area and making repeated attempts to complete the dump, the scow was towed back to port, arriving

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[49/] Insp. Rpt. Nos. 54791-92. Although Mr. Mankowski considered Mr. McAffee to be incompetent, the record indicates that his failure to perform his duties was due to "seasickness." Mr. William Hannum, Pacific Division Manager for Great Lakes, interviewed Mr. McAffee and considered him to be qualified for the job (Vol. 23-120-21).

at approximately 4:00 a.m. on Sunday, May 15. Draft of the scow upon arrival was approximately 11½'. Thereafter, Mr. Duffy repaired the scow,[50/] the balance of the scow was refilled and the load towed to the disposal site. This was designated Load No. 6, which departed the dredge site at approximately 5:05 p.m. on Sunday, May 15. Load No. 5 (Scow No. 34) had been dumped at approximately 11:19 a.m. Sunday morning. Although dredging continued until after 5:00 p.m. on Monday, May 16, no further loads were transported to the disposal site.[51/]

29. On the afternoon of Sunday, May 15, Great Lakes' Dredge No. 53 was operating on the south side of the Channel adjacent to the Todd Shipyard. A few minutes after 5 o'clock, the dredge was approached on the port side by a man in a small boat, who identified himself as John Beery (Vol. 2-48; Duffy, Vol. 5-14; Statement of Jim Duffy, C's Exh 12). Mr. Beery conversed with Mr. Duffy and ordered him to stop dredging on his (Beery's) property. He informed Mr. Duffy that there was a dispute

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[50/] The cause of the doors' failure to open was a faulty relay in an electrical panel control box (Duffy, Vol. 24-46). Mr. Duffy testified that the repair required approximately six or seven hours (Vol. 5-90).

[51/] Dredging was halted by a restraining order issued by the Superior Court of San Mateo County, upon the ground the disposal was not approved by the California State Coastal Commission. Issuance of the restraining order was affirmed by the California Court of Appeals. Port of Oakland, et al. v. The Superior Court of San Mateo County, County of San Mateo, et al., Real Parties In Interest, on July 15, 1988 (C's Exh 74). For all that appears, dredging has never resumed.

between himself and the Port concerning the dredging project. Mr. Beery is a developer, who had purchased the Todd Shipyard, presently known as the Alameda Gateway. He testified that his, actually a partnership of which he is a member, property line extended 100' beyond the pier headline and that he paid taxes on that property. He defined "bulk headline" as where the land ends and "pier headline" as the line beyond which you were not permitted by the Corps to drive piles (Vol. 2-46). Sketches drawn by Mr. Beery on aerial photographs of the pier area indicate that the dredge was not on Mr. Beery's property, but that the dredge bucket extended into property he claimed (Vol. 2-48; C's Exhs 25 and 109). While he maintained that the location of the dredge should have been obvious (Vol. 2-61), he acknowledged that part of the pier had been broken or taken off, which explained, in his opinion why Great Lakes was closer to the shoreline than they thought (Id. 2-49).

30. After his conversation with Mr. Beery, Mr. Duffy checked the EPS system which confirmed that the dredge was in the right place.[52/] He, nevertheless, decided to move the dredge in

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[52/] Vol. 4-13, 20. The electronic positioning system (EPS) as described by Mr. Duffy, utilized transponders, located at fixed and known points on shore, to determine the position of the dredge (Id. at 5, 6). While it appears that three transponders were initially utilized for this purpose, only two were operating at the time (Port of Oakland Interoffice Memo, dated May 23, 1988, C's Exh 6; Port's Exh 14). The transponders receive signals from a transmitter located on the mast of the dredge and in turn transmit signals to the dredge. These signals are utilized by a computer to determine the distance of the dredge from the transponders. Location of the dredge in terms of "eastings and northings," e.g., "easting" 1483000 and "northing" 475200," based on a grid

(continued...)

order to avoid legal problems in case Mr. Beery was right (Vol. 5-19). Mr. Duffy's first inkling that something was wrong was when the dredge would not line up in the next cut, i.e., the alignment of the dredge was such that it would intersect the shoreline rather than being parallel thereto (Id. at 19-21). Thereafter, Mr. Duffy and Stuart Hilgendorf, an engineer employed by Great Lakes, rechecked the calculations, i.e., origin and azimuth, finding nothing wrong. They then went ashore with a transit, "shooting" the dredge from the transponder locations, Howard Terminal and the APL Dock (Vol. 5-22, 26). Using the data thus collected, they calculated the actual dredge location and realized that a mistake had been made (Vol. 5-30, 31). It developed that in entering data into the computer, Mr. Hilgendorf had transposed height and code numbers, that is, instead of the height of a shore station transponder being entered as 20', it was entered as 734' (Vol. 5-35, Hilgendorf, Vol. 11-33; Great Lakes' Performance Record No. 10, C's Exh 7). This had the effect of making the dredge's location 60' to the south and 80' to the east of its intended position (Vol. 11-39, 40, 42; Duffy, Vol. 5-36, 50). Mr. Hilgendorf was aboard the tug during the transits of Load Nos. 1, 3, 4 and 5 to the disposal site (Vol. 11-27). He was assigned to the tug to assist in the task of unloading the scows at the center of the disposal site by

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52/(...continued)
coordinate system, is displayed on a computer screen.

Mr. Duffy, because of the necessity to replace Greg McAffee, who had become seasick on Load No. 2 (Vol. 5-86, 88-89). Mr. Hilgendorf indicated that if he had been on the dredge performing his normal duties, which include the taking of daily soundings, the error in the dredge's position would have been discovered earlier (Vol. 11-36, 37). He described "daily soundings" as conditional soundings designed to check the progress of the work and to determine if there is "overdigging" or "misdigging."

31. The error referred to in the preceding finding resulted in the "cut" which was started at 7:00 a.m. on Saturday, May 14, being made while the dredge was out of position (Duffy, Vol. 5-84). This "out of position" dredging continued until the dredge was moved after 5 o'clock p.m. on Sunday, May 15. A "cut chart" prepared by Great Lakes (C's Exh 113), showing progress made, reflects that a greater area was covered on May 12 and May 13 than on May 14 (Id. at 109-10). Mr. Duffy attributed this to the fact that they were digging in an area of higher bank (shallower water) and harder material. He acknowledged that he should have noticed the change in volume, but did not. He was aware, however, of the smaller area covered (Vol. 5-111). Great Lakes' Performance Record No. 9 (C's Exh 7) reflects that "hard digging" was encountered and that the 21-cubic-yard bucket on the dredge was replaced with a 14-yard bucket during the period 2:25 to 3:40 a.m. on Sunday morning, May 15. According to Mr. Duffy, clamshell dredges

are notoriously poor performers in digging consolidated material and the lesser volume was accounted for by the smaller bucket. He inquired of Mack Sullivan, who boarded the dredge at approximately 4:00 a.m. on Sunday morning, whether hard digging should be expected.[53/] The answer was in the affirmative, Mr. Sullivan pointing out that in collecting core samples for the Battelle tests, they had hit refusal, i.e., areas where the sampler would not penetrate.[54/] Amplifying this testimony, Mr. Sullivan stated hard digging was not a surprise to him, because a layer of very hard material known as "Merritt Sands" was found in the San Francisco Bay area and hard digging would be encountered in many places in the Oakland Inner Harbor (Vol. 19-38, 39).

32. Mr. Beery called EPA to complain about Great Lakes having dredged on his property on Monday, May 16, 1988.[55/] A joint

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[53/] Vol. 5-112. Mr. Sullivan is the president of Sea Surveyor, Inc., a firm providing geotechnical, geophysical and oceanographic surveys for port and harbor engineers (Sullivan, Vol. 18-105). Sea Surveyor was employed by the Port to provide hydrographic surveys, inspection and other services in connection with the Oakland Harbor project in 1988. Surveys were performed at the B1B disposal site and of the Oakland Inner Harbor. Mr. Sullivan was on the dredge early Sunday morning to bring Mr. Dan Bishop, an expert in navigation employed to assist in dumping loads at the dump site center, aboard the tug.

[54/] Although Mr. Sullivan described the samples collected as "vibratory cores" (Vol. 20-86), it appears that the sampling device was a "gravity core" rather than a powered tool, such as a drill or augur.

[55/] Memorandum, dated June 1, 1988, Subject "Investigation by A Corps - EPA Joint Panel into an allegation of dredging on the (continued...)

Corps - EPA Panel was convened to investigate the complaint. The Panel concluded, inter alia, that Great Lakes had dredged within the prohibited A-2 area of the Turning Basin on May 14 and 15, that at least two scow loads had been disposed of at the B1B site, that, based on a post-dredge survey conducted by the Corps, approximately 8,800 cubic yards of material were dredged in violation of the permit, that the Port did not comply with all of the permit conditions,[56/] that there was no evidence of intentional dredging outside of the Federal Channel and that the parties involved, the Port, Great Lakes and Sea Surveyor, cooperated with the investigation. The Panel found that Great Lakes discovered the positional error after Load No. 6 left the harbor, but that the exact location where the scow's contents had been dredged was not known until the next day. The Panel made no determination of the validity of Mr. Beery's complaint that Great Lakes had dredged on his

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[55/](...continued)
private property of John Beery," Phase I, Oakland Harbor Deepening Project, at 2, Port's Exh 14. While Mr. Beery made no reference to such a call, he apparently spoke with Mr. Patrick Cotter (finding 36, infra) on that date (Barsamian, Vol. 1-97, 160; Cotter, Vol. 13-89).

[56/] As an example, the Panel referred to the failure of the Port's independent quality assurance contractor (Sea Surveyor, Inc.) to satisfactorily perform inspections of the dredging operation. This was apparently based on the view the permit required full-time inspection at the dredging site. The permit, however, (para. 4f) merely required independent QC inspection of the dredging contractor at the dredge site and during transit to and disposal at the ODMDS. The permit was amended to require, inter alia, full time inspection by a letter from the District Engineer, dated May 31, 1988 (Port's Exh 54).

property (Barsamian, Vol. 2-1). Among the Panel's recommendations, were that EPA should institute an enforcement proceeding to assess civil penalties of not more than $50,000 for each violation against the Port and Great Lakes.

33. Engineers for Sea Surveyor calculated the volume of unpermitted dredging in the A-2 area west of the Turning Circle line, south of the south Federal Channel line and north and east of the "daylight" line as 2,150 cubic yards.[57/] Additionally, Sea Surveyor calculated that 5,735 cubic yards were dredged from an area south of the south Federal Channel line, east of the Turning Circle line and north and west of the "daylight" line. The volume of unpermitted dredging as calculated by Sea Surveyor thus totals 7,885 cubic yards. These calculations were based on comparisons of a pre-dredge survey conducted by Sea Surveyor on April 20, 1988 (Port's Exhs 20 and 131) with post-dredge surveys conducted by Sea Surveyor on May 20, June 3, 8 and 15, 1988.[58/] Mr. Sullivan

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[57/] Port's Exh 91; Sullivan, Vol. 18-117-19. "West of the Turning Circle line" apparently means west of the "east" Turning Circle line for Mr. Sullivan described the 2,150 cubic yards as having been dredged within the daylight line and within the Turning Circle. In contrast to other surveys which show only "north-south" survey lines, Exhibit 91, which is based on Port's Exh 23, shows "east-west" survey lines superimposed on the "north-south" lines. Mr. Sullivan described the "daylight" line as the top of the slope of the area dredged (Id.).

[58/] Port's Exhs 24, 22, 23 and 91. Although a separate survey, performed on June 3, 1988, is not in the record, reference to such a survey appears on the surveys shown on Port's Exhs 22, 23 and 91.

testified that in preparing the pre-dredge survey, Exhibit 20, the location of the south Federal Channel line had been misplotted at the "turning point" in the Turning Circle (Vol. 18-109). The "turning point," otherwise referred to as the "node," is the area where the south Federal Channel line bends or changes directions, sloping downward and to the right on the chart. The mentioned error was corrected on Exhibit 131, the incorrectly plotted south Channel line being shown by a dashed line, while the correctly plotted Channel line is shown as a solid line formed from three points, which Mr. Sullivan referred to as "tick marks" (Vol. 18-110). These "tick marks" appear at or near rows or lines of soundings identified by the handwritten numbers 97, 94.5 and 90 on the chart, Port's Exhibit 131.[59/] The effect of the error was to show the south Federal Channel line approximately 25 feet too far north (Vol. 18-138-39).

34. Rows or lines of soundings in the pre-dredge survey, conducted on April 20, 1988, were taken at 200 foot intervals, the survey lines on the June 8 survey (Port's Exh 22) were taken at 100 foot intervals and lines of soundings in the June 15 survey (Port's Exh 23) were taken at 25 foot intervals (Vol. 18-115-117). Mr. Sullivan explained that the closer the lines

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[59/] Locations where soundings were taken were not identified by these numbers on the chart representing the pre-dredge survey (Port's Exh 20). Line No. 92 and lower numbers are to the west of the Turning Circle, while Lines 98 and 99 are to the east of the Turning Circle.

are spaced, the more definitively the bottom can be described (Id. at 116). He explained in detail Sea Surveyor's method of making the mentioned volume computations, which included comparisons with Great Lakes' and Corps of Engineers' soundings, which he stated were comparable to within one-tenth to two-tenths of a foot, and that three methods were used to perform the calculations (Vol. 18-120-22, Vol. 20-49-51). The third method involved plotting cross-sectional profiles using pre- and post-dredge soundings and, using a "polar planimeter," which is a wheeled device having a microprocessor attached, calculating the areas or amounts removed by the dredging at the specific areas profiled and applying this data to survey lines representative of the profiled areas (Vol. 18-122-26; Port's Exh 132). Mr. Sullivan opined that the calculations shown on Port's Exhibit 91 were more accurate, because the post-dredge surveys were conducted at 25 foot intervals with crossing lines at 100-foot intervals. Although, as will be seen, there are other calculations of the volume of unpermitted dredging in the record, the final Sea Surveyor calculations are accepted as the most accurate. Sea Surveyor calculated that 60 percent of the material dredged south of the Federal Channel line as shown on Port's Exhibit 91 was from below the compacted clay layer (Vol. 18-127). Thus only 860 cubic yards of the material dredged from the A2 area were from above the clay layer. Mr. Sullivan explained that this computation was made by determining an average depth

where the clay layer was encountered and using the previously plotted cross-sectional profiles. Average depth of the clay layer was determined by taking four core samples near the edge of the dredged area--designated by circled numbers one through four on Exhibit 91--and using data from the TD stations in the Battelle Report (Vol. 18-128-29).

35. Mr. Mankowski calculated the volume of unpermitted dredging as 6,841 cubic yards (Vol. 12-90; Port's Exh 116). This volume is to be compared with 6,574 cubic yards of "out-of-channel" dredging, 2,351 cubic yards of which are inside of the Turning Circle, calculated by Mr. Hilgendorf (Vol. 11-48,49; C's Exh 148). Mr. Mankowski's calculations were based on a [Sea Surveyor] post-dredge survey performed on June 8, 1988, and cross-sections based on the June 1988 soundings. His reason for performing these calculations was that the initial calculations received from Sea Surveyor did not appear to be correct. This was apparently due in part to the fact the south Federal Channel line had been misplotted as indicated in finding 33 (Vol. 12-93). The plan attached to his calculations is a miniature copy of the post-dredge survey performed by Sea Surveyor on June 8, 1988.[60/] North-south survey lines depicted are identified by line or station

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[60/] Port's Exh 22. This exhibit contains the statement "Dredged Material Quantities For 'Post Hole' Area 6027 cubic yards." Mr. Sullivan testified that this was a computer calculation based on pre- and post-dredge survey at intervals of 200 feet (Vol. 20-94).

numbers ranging from 93 to 98.5. He therefore did an "extrapolation," assuming that dredging extended to a point midway between Stations 95.5 and 95 to the west and Stations 97 to 97.5 to the east (Vol. 18-93-94). Referring to the area around Line 94 on the post-dredge survey (Port's Exh 24), he stated that any dredging in that area was not measurable (Vol. 12-43, 44). He estimated the distance from the westernmost portion of the "daylight" line to the easternmost portion on Exhibit 91 as shown as 510 feet, plus or minus ten feet, and the distance point of the south "daylight" line to the Federal Channel line as 105 feet (Vol. 18-95-96). He stated, however, that these distances could not be multiplied to obtain the area dredged because the "daylight" line meandered considerably. He described the "day-light" line as the point of intersection where the grade begins to change. He emphasized that the "daylight" line did not necessarily represent dredging, but merely showed where the material started to "slough away" based on the soundings.

36. Mr. Patrick Cotter, Ocean Dumping Coordinator for EPA, Region IX, prepared colored contour or depth charts based on comparisons of Great Lakes' pre- and post-dredge surveys and on comparisons of pre- and post-dredge surveys conducted by Sea Surveyor for the Port (C's Exhs 154 and 155). The former exhibit was based on comparison of a pre-dredge survey conducted by Great Lakes on May 2, 1988, with post-dredge surveys conducted by Great Lakes on May 16 and May 23, 1988

(C's Exhs 112, 114, 149 and 156-158). The area depicted is identified by Stations 177 + 00 to approximately 188 + 00 (Vol. 12-149-52). Areas of less than -35 feet are shown in blue, areas from -35 feet to -38 feet are shown in white, areas from -38 feet to -39 feet are shown in green and areas of greater than -39 feet in depth are shown in red. The post-dredge surveys, as interpreted by Mr. Cotter, show a substantially greater amount of red within the Federal Channel and to some extent outside of the Channel line between Stations 181 + 00 to 183 + 00 and at Station 185 + 00 (Vol. 12-154-55, 156-58). He opined that this indicated dredging by Great Lakes deeper than -39 feet, the depth authorized by the permit[61/] and dredging into the A-2 area, which was expressly prohibited by the permit.[62/] He pointed out that the post-dredge surveys reflect that the -35 foot contour depicted by the blue area had been moved further south of the Federal Channel line and that this was additional evidence of

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61/ Dredging deeper than the -39 feet authorized by the permit during the five-day period May 12 through 16, 1988, is alleged in Counts 12 through 16 of Complainant's proposed second amended complaint. Leave to file the second amended complaint is, however, denied. See Discussion, Part A, infra.

62/ It should be noted, however, that the only red extending below the Channel line in the "node" on the chart reflecting the Great Lakes' survey of May 23, 1988, is a small lozenge shaped area at Station 182 (C's Exh 154). This seemingly indicates that this area had a greater depth on May 16 than on May 23, 1988. Although he stated that the causes of these depth changes were unclear, Mr. Cotter indicated that the changes could be due to siltation resulting from tidal changes or from slumping (sloughing) (Vol. 12-155-56).

illegal dredging by Great Lakes. In his opinion, the post-dredge surveys did not go far enough east or south to give a complete picture of dredging outside the Federal Channel. He acknowledged, however, that it was not possible to compare pre- and post-dredge soundings point-by-point and that his charts were approximations of where illegal dredging occurred, rather than mathematically precise determinations (Vol. 12-164-65).

37. Mr. Cotter prepared a similar chart (C's Exh 155) comparing the Sea Surveyor pre-dredge survey of April 20, 1988 (Port's Exh 20) with the post-dredge survey conducted by Sea Surveyor on May 20, 1988 (Port's Exh 24). In addition to showing substantially more red in the Channel area, indicating dredging deeper than -39 feet, the chart shows red extending below the south Channel line in the "node" area between Lines 93 to 95, which is roughly comparable to Stations 181 + 00 to 183 + 00 on Exhibit 154. Interestingly, while he estimated the out-of-channel dredging in the "node" as 20 feet or so based on comparisons of Great Lakes' pre- and post-dredge soundings of May 2 and May 16, 1988 (Vol. 12-164-65), he increased this estimate to 30-to-50 feet based on comparisons of Sea Surveyor pre- and post-dredge surveys of April 20 and May 20, 1988 (Port's Exhs 20 and 24, Vol. 12-170-71). This is apparently due in part to the plotting error by Sea Surveyor whereby the south Federal Channel line was shown as 25 feet too far north (finding 33).

38. Mr. Sullivan reviewed the colored contour charts prepared by Mr. Cotter. He testified that Exhibit 154 was not useful in determining the amount of dredging that may have occurred south of the Federal Channel line, because the charts were not prepared to scale, resulting in a distortion of approximately 40 percent in an east-west direction and on unknown amount in a north-south direction (Vol. 18-130-32). He had the Sea Surveyor data double checked, including the cross-sections on Port's Exhibit 132, and stated "we found" no indication of dredging outside of the south Federal Channel line beyond that reflected on Port's Exhibit 91 (Vol. 18-133-34). He noted that, while the center chart of Complainant's Exh 154, purportedly reflecting the Great Lakes' post-dredge survey of May 16, 1988, showed an area of approximately 180 feet which might have been dredged in the "node area," he was unable to duplicate (locate) a 39-foot contour in that area on the Sea Surveyor bathymetric charts.[63/]

[63/] Vol. 18-135-36. Mr. Hilgendorf referred to depths of minus 37.8 feet, minus 36.9 feet, minus 34.5 feet and minus 36.2 feet immediately south of the Channel line at Station 182 + 00 on the Great Lakes' pre-dredge survey conducted on May 2, 1988 (C's Exh 112), which are to be compared with depths of 41.2 feet, 39.5 feet, 37.5 feet and 35.3 feet on the Great Lakes' post-dredge survey of May 16, 1988 (C's Exh 149; Vol. 11-54-56). While he opined that this indicated "excessive digging," Mr. Hilgendorf pointed out that the Great Lakes' post-dredge survey conducted on May 23, 1988 (C's Exh 114) showed a single number in red, apparently 39.5, indicating depths of greater than 39 feet, eight-to-ten feet south of the Channel limit at Station 182 + 00, and that the other numbers, apparently 38.7 and 36.7, show less digging.

39. Concerning comparisons of the Sea Surveyor pre- and post-dredge surveys shown in Complainant's Exhibit 155, Mr. Sullivan testified that on an east-west scale, the chart appeared to be accurate, but that on the north-south scale the Federal Channel line was off by 25 feet and should be moved south. He reiterated that he could find no evidence of dredging south of the south Federal Channel line in the "node" area (Vol. 18-139). He referred, however, to a "phenomenon" occurring just south of the "node." He described the "phenomenon" as a small area of a natural slump or canyon appearing to the right of "Event 403"--the "node" is between Events 400 and 405--on a chart (Port's Exh 133), made on June 15, 1988, by the use of a device, referred to as "side scan sonar."[64/] He stated that, if the slump were on land, it would be called a landslide. Other than the difference in slope at Event 403, Mr. Sullivan testified there were no features at the "node" on the side scan sonar record, which indicated any sort of dredging (Vol. 18-143). Comparing the

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[64/] Vol. 18-140-44. Side scan sonar operates by means of sound waves which are reflected from hard objects, such as a shipwreck or a log on the ocean floor, or the edge of a channel, which are recorded as dark marks on the sonar record (Vol. 20-117). The darker the mark, the more sound has been reflected. Port's Exhibit 133 consists of two parts, the upper (white) part being referred to as a "track line chart" and a second sheet, which is the actual side scan sonar record for Events 399 to 405. Mr. Sullivan described "events" as the hydrographic surveyor's way of keeping track of data. The third line from the bottom of the "track line chart" covers Event Nos. 399 to 409, closely approximates the south Federal Channel line at the "node," and is the survey of primary interest here.

side scan record, which was performed at a range of 50 meters on each side of the sonar device, referred to as the "tow fish," to a pre-dredge side scan survey, conducted on May 1, 1988, at a range of 100 meters on each side of the device Port's Exhs. 39 and 40), he concluded that the slump existed prior to the dredging of concern here (Vol. 18-146; Vol. 20-103, 113, 116-17). He was therefore of the opinion that no dredging occurred south of the south Federal Channel line at the "node" (Vol. 20-121-22). In other testimony, he described the slump or change in slope at the "node" as occurring 60 feet south of the Federal Channel line and as extending to the Channel line (Vol. 19-220, 222). Mr. Sullivan acknowledged that he was not a geologist or soils engineer and could not determine the cause of the slump. Mr. Sullivan was, however, a knowledgeable, competent and forthright witness and it is concluded that the record will not support a finding of additional dredging south of the Federal Channel line at the "node" area.

40. On the morning of May 16, 1988, Regional Administrator Daniel McGovern, Corps Division Commander General Patrick Kelly and members of their staffs attended a meeting in the Burlingame City Hall (San Mateo County) with Congressman Thomas Lantos and fishermen opposed to the disposal of dredged material at the BIB site (McGovern, Vol. 19-117-18). The fishermen were assured that only "clean" materials would be disposed of in the ocean (Id. at 119-20, 124). Upon returning to his office,

Mr. McGovern was informed of the unpermitted dredging by Great Lakes. This resulted in convening of the joint Corps-EPA panel, which investigated the incident with the results previously indicated.[65/] Mr. McGovern testified that he was "flabbergasted" that the Port would have permitted this to happen and gravely concerned that a serious violation of environmental law had occurred, having potentially grave effects upon the environment and public confidence in government (Vol. 19-120, 123, 125). He denied being embarrassed by the incident, stating that if anyone was embarrassed, it should have been the Port (Vol. 19-157). He explained it was clear that concurring in disposal at the B1B site without conditions would not have protected the environment and that he would not have concurred had he known that those conditions, i.e., that contaminated materials not be disposed at the B1B site, would not be respected. By

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[65/] Finding 32, supra. A press release, issued jointly by EPA and the Corps on June 1, 1988, states that EPA is taking administrative action to assess penalties against the Port and Great Lakes and that the Corps has suspended dredging by the Port (Port's Exh 108). Regional Administrator Daniel McGovern is quoted as stating "(t)his is a serious violation. . ." and that "EPA is assessing the maximum penalty under the law against the Port for each of the violations." Although there is no document ordering the suspension of dredging in the record, the recommendations of the Corps-EPA investigatory panel state that the Corps has suspended dredging by the Port, pending the submission and approval of a management plan for dredging and disposal activities (Port's Exh 14 at 5). Additionally, a letter from the District Engineer to the Port, dated June 7, 1988 (Port's Exh 58), states that authorization to dredge has been withdrawn pending approval of revisions necessitated by permit modifications.

contaminated materials, he meant materials unsuitable for ocean disposal (Id. at 131).

41. Regarding the proposed penalties, Mr. McGovern reiterated that the violations were the most serious which could conceivably have occurred. He explained that the penalty [violations] were reviewed under the appropriate [statutory] criteria, a staff recommendation was made, discussions were held and Mr. Seraydarian made his decision.[66/] He denied making any independent recommendation as to the penalty, stating that the staff recommendation was for the most severe penalty available under the facts and the law and that no one, including himself, disagreed with that view (Vol. 19-126-28). To him, the only question was how many counts could appropriately be alleged and what did the law permit with regard to each of those counts.

42. Mr. John L. Lambert, Assistant Chief Engineer for the Port, testified that he received a call from Mr. Seraydarian on June 1, 1988, the day the complaint was issued, in which he was informed that a complaint against the port and its contractor, Great Lakes, had been signed and was being issued that day (Vol. 23-107-08). Mr. Seraydarian stated that there were three major violations and that the Port was being assessed a penalty of $150,000 and Great Lakes a penalty of

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[66/] Mr. Harry Seraydarian is the Director, Water Management Division, Region IX. He was delegated authority to assess penalties under MPRSA by a memorandum from the Regional Administrator, dated June 1, 1988 (Port's Exh 107).

$100,000. When Mr. Lambert inquired as to whether the three [statutory] factors had been considered in assessing the penalties, the answer was in the affirmative. Mr. Seraydarian said that the proposed penalties had been discussed with the Regional Administrator, who considered that the violations were major (Id. 109, 110-14). He (Seraydarian) also stated that he was influenced by the realization the urgency to accomplish the dredging was not as great as [the Port] originally indicated.[67/] Mr. Lambert interpreted Mr. Seraydarian's comment as indicating Mr. McGovern was influenced as to amount of the penalty by an alleged lack of urgency for the project. Under cross-examination, Mr. McGovern indicated that the volume of unpermitted dredging was important in considering the gravity of the violation only if the amounts were de minimis (Id. at 131). The Region apparently adopted the view that Great Lakes was on notice of the unpermitted dredging no later than the time of Mr. Beery's contact with Mr. Duffy, which was shortly after 5 o'clock p.m.

[67/] The Port's desire to accomplish the dredging as expeditiously as possible was induced by the fact the container ship President Truman was scheduled into the Port on or about June 10, 1988. Allegedly new information was to the effect that the President Truman and ships of similar size could dock at the Port by utilizing the tides. The ships could also be light-loaded, i.e., "cargo could be left on the dock" (Declaration of Stephen J. Potash, Vice President of American President Companies, Port's Exh 153). Mr. Potash indicated that such practices were not economical and would not be accepted by his company on a long-term basis. Mr. Lambert pointed out that the fact container ships could come in on the tides was discussed in the EIS and was not new information.

on Sunday, May 15, 1988 (Vol. 19-150-51; McGovern Interrogatories, Port's Exh 137).

43. Complainant's primary witness on the computation of the proposed penalties was Ms. Loretta Barsamian, Chief of the Wetlands, Oceans and Estuaries Branch. She referred to the three factors the Act requires be considered in determining penalties, i.e., gravity of the violation, history of prior violations and demonstrated good faith to comply once the violation has been identified (Vol. 1-110-12). She stated that EPA considered the violations to be a grave offense, because contaminated material was being disposed of in the ocean. A factor in this determination was that the B1B area was considered by the fishermen to be prime fishing grounds. The other element of gravity was what she characterized as the "sloppiness of the operation" (Id. at 115-17). While most of this criticism was directed at the Port for being understaffed, failing to provide full-time QA/QC on the dredge operation, failing to fill out reports and take measurements, etc., she specifically referred to an inexperienced and inadequate person (Greg McAffee) being on the tug to assist in navigation. This latter failure, if it be such, is the responsibility of Great Lakes rather than of the Port. The fact that Great Lakes encountered hard digging should, according to Ms. Barsamian, have indicated that something was wrong [with the location of the dredge] (Vol. 1-164). Great Lakes' failure to recall and stop the dumping of Load No. 6,

after the unpermitted dredging had been discovered, was considered to be especially egregious.[68/]

44. Ms. Barsamian referred to leaking barges, failure of the doors on the scows to close, and problems with all six loads as other evidence of a "sloppy" operation by Great Lakes (Vol. 2-79, 80). EPA does not have a history of prior violations of MPRSA by either the Port or Great Lakes (Vol. 1-112-13). Regarding demonstrated good faith efforts to comply once the violation had been identified, Ms. Barsamian pointed out that Mr. Beery had confronted Great Lakes and ordered it to stop dredging on his property and that this could be considered notification of a potential violation. She apparently considered that the issue of good faith efforts to comply had been mooted by the fact the Superior Court had enjoined further dredging by the Port. The result was that history of prior violations and demonstrated efforts to comply neither increased or decreased the proposed penalties (Vol. 1-118).

[68/] This failure was apparently considered in determining the proposed penalty of $175,000 against Great Lakes, because Complainant has stated that Great Lakes should be fined the full $50,000 for knowingly dumping this load, laden with contaminated materials, in the ocean (Complainant's List Of Witnesses and Exhibits, dated October 3, 1988, at 23). Because the dredge positioning error was discovered or verified at 8:10 p.m. on May 15 and Load No. 6 was not dumped until approximately 10:13 p.m. (Chronological Statement of Events, C's Exh 6), it apparently would have been possible for Great Lakes to prevent the dumping by calling the tug. The Corps-EPA Joint Panel, however, determined that the exact location where the scow's contents had been dredged was not known until the next day (finding 32). This determination was confirmed by Mr. Duffy (Vol. 24-50, 51).

She testified that no specific dollar amount was assigned to each of the counts in the complaint (Vol. 2-80).

45. Concerning meetings and briefings where the proposed penalties were discussed, Ms. Barsamian described Regional Administrator Daniel McGovern as gravely concerned that contaminated materials had been disposed of in the ocean, but refused to characterize him as "embarrassed."[69/] She maintained that the proposed penalties did not come from the Regional Administrator, but were recommended by the staff and denied that the penalties were augmented, because of Mr. McGovern's personal concerns (Id. 114, 121, 126-27). Because of the extraordinary efforts of Complainant to keep Mr. Walls from testifying,[70/] his version of the conversations with

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[69/] Mr. Brian Walls, an engineer and Corps' project manager for the Oakland Harbor dredging project, testified that he had two conversations with Ms. Barsamian concerning the penalties EPA was proposing to assess, one in the fall of 1988 and the second in January 1989 (Deposition of Brian Walls, Vol. IV, 84, 85; Vol. V, 6-12, Port's Exh 149). The second conversation took place after a scoping meeting concerning the proposed designation of a permanent site for the ocean disposal of dredged material. The substance of Ms. Barsamian's explanation of why the penalties were so large was that the Regional Administrator was personally involved and really pushing the fines, because he had gone "out on a limb" for the Port in approving the B1B site and was politically embarrassed (Id. Vol. V, 8, 12). While Ms. Barsamian confirmed the second conversation with Mr. Walls, she testified that she didn't recall using the word "embarrassed," and denied that she would have done so, because Mr. McGovern doesn't confide his personal feelings to her (Vol. 1-124-27).

[70/] Notwithstanding the fact that Mr. Walls had no role in determining the amount of the proposed penalties, at his deposition counsel for Complainant directed Mr. Walls not to answer questions as to his conversations with Ms. Barsamian upon the patently erroneous ground the conversations were protected by the (continued...)

Ms. Barsamian concerning the amount of the penalties is accepted as accurate. In the final analysis, however, it makes little difference whether Ms. Barsamiam characterized Mr. McGovern as embarrassed or whether he considered himself to be so, because it is clear that he viewed the violations as the most serious that could have happened and characterized himself as "flabbergasted" and astonished that the Port would have allowed the unpermitted dredging to occur. It is simply not credible that this attitude had no affect on the penalties Complainant seeks to impose (see finding 42) and may account for the zeal by which this case has been prosecuted, e.g., Complainant is still seeking to amend the complaint to include additional counts.

46. As noted at the outset of this opinion, Counts 4 through 8 of the first amended complaint charge Respondents with dumping Loads 1 through 4 and 6 at a greater distance from the center of the B1B site than authorized by the permit.[71/] Mr. Cotter

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[70/](...continued)
deliberative process privilege (Vol. IV, 73-83). Additionally, Mr. Seraydarian called the District Engineer, Col. Yanagihara, and requested him to direct Mr. Walls not to answer such questions. Col. Yanagihara refused (Vol. V - 42).

[71/] Paragraph 4(g) of the Special Conditions of the Permit provides:

> (g) The tugs used to tow barges or scows must be equipped with a medium range Electronic Positioning System (EPS). The EPS shall be capable of displaying and recording the disposal vessel's location in an acceptable coordinate system which can be related to, or is directly based on, the standard Lambert plane rectangular

(continued...)

defined the center of the ODMDS as the intersection of the coordinates for longitude and latitude specified in the permit, i.e., 37°29'00"N, 122°48'00"W (Vol. 2-186-87). He pointed out that the Regional Administrator's concurrence letter further defined the site as having a radius of one nautical mile, which was measured from the intersection of the mentioned coordinates. This boundary of the B1B site is not, however, specified in the permit. To Mr. Cotter, "disposal vessel" in the permit condition (note 71 supra) meant the scow. Mr. Walls, who drafted para. 4.g of the permit, agreed that disposal vessel referred to the barge or scow (Port's Exh 149, Vol. 1-114). Mr. Cotter's interpretation was that disposal could not commence before the bow of the scow reaches a point which is 30 meters from a line perpendicular to the path of travel which passes through the site center, nor could

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71/(...continued)
coordinate system. The accuracy (repeatability) of the EPS shall be ± 3 meters.

The Electronic Positioning System shall also be used to display and record the disposal vessel's location at 1-minute time intervals in the vicinity of the disposal site. The EPS shall be activated the entire time the disposal vessel is within 1 nautical mile of the disposal site boundary. Positional data shall be annotated to indicate the time that actual dumping is in progress. The disposal vessel shall pass within 20 meters of the ODMDS center and disposal shall not commence before closing to within 30 meters of the line perpendicular to the path of travel which also passes through site center. Nor shall disposal continue after the vessel passes 60 meters beyond the aforementioned line. Vessel speed shall be adjusted so that all dredged material is discharged within the given limits.

disposal continue after the bow of the scow reaches a point which is 60 meters beyond the mentioned line (Vol. 2-163-66, 168, 181). He illustrated his understanding by a sketch (C's Exh 116). Under this view, the permit required disposal to be completed while the scow traveled a maximum distance of 90 meters and the length of the scow is not relevant to the question of whether there has been a permit violation. The length of the scow will, of course, affect actual placement of the dredged material and Mr. Cotter added 30 meters to the length of the scow, which he thought was 71 meters, and concluded that the maximum distance the stern of the scow could be from the dump site [when dumping commenced] was 101 meters.[72/]

47. Mr. Mankowski, however, interpreted the permit as meaning that dumping could begin when the bow of the vessel is 20 meters from the center of the site and that dumping must be completed when the aft of the vessel is [no] further than 30 meters from the site (Vol. 12-143). While he was mistaken as to the distances stated in the permit, his interpretation is accepted as the better view, because the vessel hasn't "passed 60 meters beyond a line [perpendicular to the path of travel which also passes through the site center] until the entire vessel has done so." Accord: Brian Walls (Deposition, Vol.

[72/] Vol. 2-192-93. "Dump site" may not be equated with the center of the B1B site, because the permit allows a 20-meter tolerance around the ODMDS center.

I, at 112-13, Port's Exh 149). The permit does not read "vessel or any part thereof" as would be necessary for Mr. Cotter's restrictive interpretation to prevail. Therefore, the length of the scow must be added to the allowed dump distance both on the approach to the mentioned line and after passing that line. According to Mr. Cotter, the purpose of para. 4.g of the permit was to have the material dumped in a confined [particular] spot, so the movement of the mound could be monitored over time.[73/] He stated that consistently missing the dump site would spread the material around and perhaps affect a greater area than the disposal site boundaries. Mr. Walls indicated that the reasons for the restricted area of dumping in Special Condition 4.g were similar to those given by Mr. Cotter, i.e., an interest in measuring how much of the material would reach the bottom, how much it would spread and the stability of the material in the long-term (Vol. III-29, Port's Exh 149). He further testified, however, that a major, if not the major, reason for the provision was to demonstrate the feasibility of capping (Vol. IV-39-42). He explained that controlled, very accurate

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[73/] Vol. 2-168-69. If minimal spreading of the material were a principal goal, Site 1M would be preferred, because the Corps determined that disposal at that site would result in the material spreading over the smallest area of any of the candidate sites (finding 7). Additionally, Site 1M more nearly approximates the depths at which capping has been successfully demonstrated and monitoring would be easier and less expensive ("Evaluation of Capping Dredged Material From Oakland Outer And Inner Harbors," by Dr. Michael R. Palermo, WES, enclosure to memorandum, dated February 16, 1988, Port's Exh 59).

placement of the contaminated material, as well as the capping material, was necessary for capping to be a viable option. He characterized the monitoring and disposal provisions of the permit as experimental (Vol. II-6). In other testimony he indicated that the monitoring program had experimental elements (Vol. IV-42).

48. Mr. Cotter prepared a chart which he considered showed the locations of the six dumps (C's Exh 117). This chart was made by placing a plastic overlay over a chart, received from the Port (C's Exh 26), which purportedly showed the location of the six dumps. Neither the data used to plot the dump locations on Exhibit 26 or the individual or individuals doing the plotting have been identified. Mr. Cotter determined that only Dump No. 5, 22.7 meters from the site center, complied with the permit (Vol. 2-190-92). The Port's evidence as to the location of the six dumps is reflected in charts, downsized versions of which are in the record (Port's Exhs 92 and 135). Although Mr. Sullivan did not prepare Port's Exhibit 92, he provided information used in its preparation, i.e., the heading of the scow and the location of the bow of the scow at the beginning and end of a dump (Vol. 19-13). He testified that all of the dump locations on Exhibit 92 appear to have been correctly plotted, except for No. 2 which should have been shown 300 feet further inside the 3,000' x 3,000'

square shown on the charts.[74] This correction does not mean that Dump No. 2 complied with the permit, as the Port has conceded that Dump Nos. 1, 2, 4 and 6 were outside the permit limits (Proposed Findings Of Fact and Conclusions Of Law at 36).

49. Mr. Cotter plotted Dump No. 3 as 155.3 meters from the site center, while the Port contends that this dump was within permit requirements. This contention is based upon a plot of the dump site locations by Great Lakes' engineer Stuart Hilgendorf, which appears to show Dump No. 3 approximately 50 feet from the B1B site center (C's Exh 147). He testified, however, that his plot showed that Dump No. 3 was only 30 feet from the dump center.[75] His plots are based on the location of the scow at the beginning of the dump and its location 30 seconds later, when the dump should have been completed (Vol. 11-18, 19). Both Mr. Hilgendorf and Mr. Bishop plotted Dump No. 6 as approximately 80 meters from the site center and, as noted previously, the Port has conceded that this dump was

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[74] Vol. 19-14. This square represents the area sounded by Sea Surveyor on pre- and post-dump surveys.

[75] Vol. 11-20. This chart (C's Exh 147) also shows dump locations plotted by Mr. Dan Bishop of Sea Surveyor (note 53 supra). While the transcript reflects that Mr. Bishop's plots were in red and Mr. Hilgendorf's were in green, these colors do not appear on the chart in the record.

outside permit limits.[76/] A chart (C's Exh 26) contains a notation respecting Load No. 6 "had to veer away from center due to fishermen." Although the only testimony supporting this note is hearsay by Mr. William Hannum (Deposition, C's Exh 150, at 131), Daily Report Nos. 54215 and 54216, dated May 15, 1988, confirm that there were fishing boats in the area and that 12 were at the site center (finding 27).

50. Mr. Sullivan testified that the electronic positioning system (EPS) used by Great Lakes was "state-of-the-art" and that there was no system, other than putting an EPS on the scow and manning it, which would give better accuracy than Great Lakes was able to achieve with its system (Vol. 19-12). He pointed out that the permit specified the EPS was to be on the tug and that achieving plus or minus three meters accuracy with the tug did not mean that the location of the scow would be known to within three meters (Id. 10, 11). He estimated the accuracy of a determination of the location of the scow as from plus or minus five to plus or minus seven meters. According to Mr. Sullivan, Load No. 4 was the only load where the EPS was not functioning, because one of the shore

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[76/] The Port's concession that Load No. 6 was not dumped within permit limits is apparently due to the failure of the scow to pass within 20 meters of the site center. Because dumping could continue for a distance of 60 meters plus the length of the scow after passing the site center, a dump 80 meters from the site center could be in compliance with the permit. The Port's concessions are not, of course, binding on Great Lakes. Great Lakes has contented itself with the assertion that Loads 3, 5 and 6 were within, or very close to, the 60-meter target area (Post-hearing Brief at 39).

transponders began giving faulty readings for a few minutes during the critical period of the dump or attempted dump (Vol. 19-16-19). In other testimony, however, he acknowledged that one of the transponders was not functioning at the time Load No. 1 was dumped (Vol. 19-18). A speed letter, dated April 27, 1988, signed by Mr. Mankowski, authorized dumping of Load No. 1 by Loran C coordinates, if the EPS failed (Port's Exh 35). Mr. Sullivan's evaluation of Great Lakes' performance was that they were improving and that with practice, the site center could be hit with a fair degree of accuracy (Vol. 19-22, 23). He pointed out that three of the last four loads were close to the site center and that these three dumps were made with the tug going in excess of five knots. While he indicated that greater speed of the tug would improve accuracy, he recognized that more speed might result in spreading the material over a larger area. Mr. Mankowski, who was aboard the tug during the transport of Loads 1 and 2 to the disposal site, was surprised that the loads were not dumped more closely to the site center (Vol. 12-143).

51. Sea Surveyor conducted an after dump survey of the B1B site, actually of a 3,000' x 3,000' square in the center of the site, between June 6 and 11, 1988 (Sullivan, Vol. 18-108, 164, Port's Exh 134). None of the mounds supposedly formed by the six dumps could be detected. This was not surprising to Mr. Sullivan, because dredged material, especially sand and silt, would not fall straight down, but would tend to spread

out (Vol. 19-185-87). This tendency is increased by the fact that a scow might travel approximately 150 feet while a dump was in progress.[77] With a tide gauge in place, he estimated the accuracy of his survey as approximately plus or minus one foot. Sea Surveyor's tide gauge, which had been placed at the site center, had apparently been taken by the fishermen and Mr. Sullivan was of the opinion that less than two feet of material could not be detected. He testified that the earliest they expected to see any depth changes at the site was after ten to 15 loads had been placed and that the plan was that Sea Surveyor would then perform an "intermediate dump survey" to ascertain if the beginning of a mound could be detected.[78] The purpose was to demonstrate that precision dumping was feasible. He stated that the Port recognized that

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[77] Mr. Walls put it in engineering terms, i.e., "some of it [energy] would be transferred to a horizontal velocity when it [dredge material] impacted the bottom. So it [dredged material] would spread out" (Vol. III-23, Port's Exh 149). He testified that the error in bathymetric measurements can easily be two or three percent and in 300 feet of water you could be off far enough that an individual barge load of dredge material could not be located. He asserted that the volume of material taken to the site was too small to be measured and too small to have any measurable affects (Vol. II-6-8). Dr. Wright opined that the possibility of measurable affects from dumping unpermitted material at the B1B site "are out of the realm of reason" (Vol. 17-131-33).

[78] Vol. 18-162-63. Port's Exhibit 135 is a plot of the B1B site, showing the locations of the six dumps. It also shows the depth of a deposit one kilometer from the start of each dump as plus or minus one eighth inch, assuming 500,000 cys were dumped at each starting point. Interestingly, by this calculation, only materials which under this simulation were dumped at the location of Dump No. 2, would remain within the 3,000 ft. x 3,000 ft. square at the center of the B1B site.

a learning or practice curve would be necessary. Mr. Walls agreed that a "shakedown" period would be necessary in order for navigation of the precision required by the permit to be [consistently] achieved (Vol. I-126-29). Mr. Hannum viewed the instant contract as research and development for the big project, i.e., deepening the Inner Harbor to minus 42 feet (Deposition, C's Exh 150, at 82, 85). He emphasized that such precise navigation had not been tried before (Id. 122-23).

52. Paragraph 4(d) of the permit provides in pertinent part: "(n)o overflow of the dredged material containment barges or scows is allowed." To Mr. Cotter, this meant that none of the dredged material placed in the barge or scow was allowed to spill over the sides of the scow at any time (Vol. 2-196). Mr. Duffy interpreted the provision similarly, stating that it meant no overflow of dredged material (Vol. 24-52). Mr. Duffy's concept of "dredged material," however, was that it consisted of mud or bottom sediments. Although the permit provision is inartfully worded, "dredged material" modifying or describing barges or scows rather than overflow, the interpretation set forth by Messrs. Cotter and Duffy was apparently the one intended and is accepted as reasonable.

53. Referring to a video tape of the dredge operation as a bucket was unloaded in a scow (C's Exh 85A), which he described as showing a little bit of overflow on this side of the gunwale, Mr. Cotter asserted this was a clear violation of the special

condition [prohibiting] over flow.[79/] Viewing a second video tape of the Great Lakes' dredging operation as a dredge bucket was unloaded (C's Exh 85B), Mr. Mankowski described water and slurry flowing over the side of the scow (Vol. 3-107-08). Mr. Hilgendorf apparently viewed the same tape in Great Lakes' offices and described it similarly, i.e., as showing water mixed with sediments, i.e., "dirty water," flowing over the coaming (Vol. 11-84, 85). These videos and the accompanying testimony do not establish violations of the permit, however, because, although "dredged material" undoubtedly normally includes some water, "muddy water" is considered not to be dredged material. Moreover, the nature of a clamshell operation is such that water and mud or slurry is going to flow from the dredge bucket as it is lifted from the water (Great Lakes' Exh 11) and it is accepted clamshell dredging practice for muddy water in the scows to be displaced by solid material in the course of loading, in which case the water will flow over the flashboards or gunwales of the scows. See letter from the Acting Deputy District Engineer, Jack E. Farless, to Charles R. Roberts, Chief Engineer for the Port, dated July 28, 1989 (Great Lakes' Exh 20). The "no overflow"

[79/] Vol. 3-75, 77, 78. This evidence and evidence that Great Lakes dredged deeper than authorized by the permit was admitted over the objection that it was not relevant to any charge against Respondents, based upon counsel's argument that it was relevant to the amount of the penalty (Vol. 2-196-98, Vol. 3-85, 121-23). Counsel for Great Lakes repeatedly affirmed this objection (Vol. 21-41, 42, and Vol. 23-116).

provision must therefore be regarded as primarily intended to prevent overfilling of the scows and loss of material over the sides or gunwales of the scows while in transit to the disposal site. See the Letter from Col. Galen H. Yanagihara, District Engineer to Raymond M. Paetzold, Esq., counsel for Great Lakes, dated October 2, 1989 (Great Lakes' Exh 20). Evidence of such loss during transit to the disposal site is limited to Load No. 4, i.e., an observation by Mr. James Ramber, an inspector for Sea Surveyor, as they approached the dump site to the effect that the draft of the scow could not be read, but that it looked like approximately two feet was missing from the top of the load due to the rolling, pitching and yawing of the scow.[80/] Mr. Hilgendorf testified that he and Captain Cole were reasonably confident from the draft of the scow that no material leaked as they returned to Port with Load No. 4 (Vol. 24-114-151) and, for all that appears, the leaking reported in Daily Report No. 54213 was confined to the dump site area.

54. As indicated, supra note 61, Complainant's proposed second amended complaint includes Counts 12 through 16 charging Great Lakes with dredging deeper than minus 39 feet MLLW authorized by the permit. Mr. Mankowski described that the bottom surface after clamshell dredging as essentially "an egg crate

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[80/] Daily Report No. 54212, May 14, 1988. Mr. Cotter's testimony as to what he was told in this regard by Steve Fitz, a fisherman, is blatant hearsay lacking in probative value and is considered to have been stricken from the record.

[carton]," having high spots and low spots (Vol. 12-32). He explained that the practice was to "sweep the bottom" with the clamshell bucket to knock down the high spots and create as flat a bottom as possible (Id. 116). Accord: John Wilson, Principal Engineer for the Port (Vol. 16-147-49). Mr. Walls testified that the Corps normally allows a two-foot overdepth or tolerance [as to dredging depths] and questioned whether it was possible for the contractor to adhere to a one-foot overdepth (Vol. III-61, 62, Port's Exh 149). He indicated that the fact the contractor did not get paid for dredging deeper than authorized was incentive enough not to do it (Vol. III-49, 57, 58). Mr. Wilson regarded one-foot overdepth as an impossible tolerance for a job this size "bucket-by-bucket" (Vol. 16-145). Moreover, he testified that it was not the Port's intention to limit dredging to minus 39 feet, but that minus 39 feet was the limit for pay purposes (Id. 193-94). Mr. Charles Roberts, Chief Engineer for the Port and a former District Engineer for the San Francisco District of the Corps, testified that overdredging to minus 39 feet was authorized and that, if the contractor exceeds that depth, it is not a breach of contract (Vol. 23-46). He stated the contractor simply does not get paid for the excess. Based on his experience with clamshell dredging, i.e., some [bites] would be deeper than minus 39 feet and some would be less than that depth, he opined that a cut deeper than minus 39 feet would not be a violation of the permit (Id. 47). Nothing in the

permit requires or specifies the use of a clamshell dredge. The Port's contract with Great Lakes, however, specified that clamshell equipment would be used and Complainant was on notice of this fact, because the EIS and the Notice Of Intent To Use Disposal Site state that dredging would be by clamshell.

55. Paragraph 10 of the proposed second amended complaint alleges that Great Lakes intentionally dredged some of the first unpermitted sediments from ten-to-twenty feet south of the southern boundary of the Federal Channel and disposed of the resulting unpermitted sediments at the B1B site. Although leave to file the second amended complaint is not granted, evidence relating to this issue will be set forth, because of its possible relevance to the amount of the penalty. As we have seen (finding 2), para. 1.03 of the Special Provisions of the contract provided that Phase I, excluding Areas A-1 and A-2, shall be dredged first. The Title Sheet of the Dredging Plan (C's Exh 26), however, specified that Areas A-1 and A-2 were to be dredged first. It should be noted that the cited paragraph of the Special Provisions provided for the removal of all material which sloughs into areas to be dredged from outside the dredge limits at the Turning Circle to the required dredge depth prior to acceptance of the work. Although the contract contemplated that Areas A-1 and A-2 would be dredged once an acceptable site for disposition of the material had been determined, it is concluded that the

mentioned provision of the contract governed acceptance of the work in the Channel area of the Turning circle until notice to dredge Areas A-1 and A-2 was given. Mr. Hannum, identified in note 49, supra, apparently so interpreted the contract for he testified that "(w)e had to leave grade of minus 38 in the Federal Channel portion [of the Turning circle] (Vol. 23-153). Although Mr. Mankowski denied telling Great Lakes he wanted grade at the Channel line, he acknowledged that the contract plans required that result and that he told Mr. Duffy to dig as close as possible to the Channel line (Vol. 21-2-4; 65). In other testimony, he stated that he expected grade at the Channel line when the material stopped sloughing (Vol. 21-66). Moreover, when Mr. Mankowski directed Mr. Duffy to work toward the Alameda side, he ordered him to stay away from the contaminated area, but to push the Channel line and over-dredge, if necessary (finding 25). It is concluded that the Port wanted and expected grade at the Channel line in the Turning Circle.

56. A "cut chart" prepared by Great Lakes shows a double line along the south Federal Channel line from Station 177 + 00 to approximately 188 + 00 (C's Exh 113). This chart was originally prepared from a chart reflecting the Great Lakes' pre-dredge survey conducted on May 2, 1988. The second of the mentioned lines, i.e., the line nearest the bottom of the chart, reflects an intent by Great Lakes to dredge ten feet beyond the south Channel boundary (Hilgendorf, Vol. 11-40, 41,

79). Mr. Hannum testified that when dredging the Federal Channel or for that matter anyone's property, the dredging contractor was required to "leave grade" at the Channel line, i.e., from the "toe" or bottom of the slope to the "toe" on the opposite side (Vol. 23-125-26). To accomplish this and leave a one-to-one slope as required by the plans, he asserted that it was necessary to dredge the slope.[81/] Mr. Duffy testified that the Port wanted grade at the Channel line and that in order to do so, it was necessary for the dredge bucket to straddle the line (Vol. 5-71, 73-78). He explained that this was necessary for two reasons, i.e., to account for any sloughing of the material and because the bucket closes in an arc rather than a straight line, proper grade is not achieved

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[81/] Vol. 23-151. The Corps agrees. See letter from Jack E. Farless to Loretta Barsamian, dated July 1, 1988 (Exh 8 to Deposition of Brian Walls), providing in pertinent part:

> The Federal Channel limits as shown on the plans and on navigational charts indicate the limits of authorized federally maintained depths. During the course of dredging, the channel edges are sidesloped to limit the slumping of material into the channel proper. Slumped material entering the channel would reduce the authorized depth. Channel limits will normally have a 1 to 1 upto [sic] a 3 to 1 sideslope depending upon the type of material present.
>
> The Oakland inner harbor is on an annual maintenance schedule. The dredged material comes from the channel proper and sideslope. The sediment removed is new material which has entered the system since the previous maintenance dredging episode. Therefore, the sideslope material along the Federal Channel through the proposed turning circle is of new origin and not of the material under consideration by the joint COE/EPA Technical Review Panel.

at the Channel line by dropping the bucket against that line (Vol. 24-12). He testified that the permit, allowing him to dredge Phase I, gave him authority to "leave water" on that line, i.e., leave grade at the Channel line (Vol. 5-70). Mr. Walls agrees for he stated "(t)hat if they [Great Lakes] were allowed to dredge the Channel, they were also allowed to dredge the side slope to the Channel." (Vol. II-42). In other testimony, Mr. Walls referred to the fact the plans did not specify a slope at the Channel line within the Turning Circle for the obvious reason the plans contemplated that the "wings" of the Turning Circle, i.e., the A-1 and A-2 areas, would be dredged first.[82/] He, nevertheless, opined, that the dredging contractor did not have any choice but to cut a slope at the Channel line, because, if he dredged a vertical wall, the material would slough into the Channel, and the contractor would be required to remove it in order to complete the job (Vol. IV-90, 91). He stated that unless the contractor was specifically told otherwise, it was reasonable to assume that a sideslope was to be cut.

57. Dr. Brian Melzian, Region IX Oceanographer, was the principal scientific adviser to the Regional Administrator and his staff as to the suitability of material from the Oakland Inner Harbor for ocean disposal. Although Dr. Melzian was a

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[82/] Vol. IV-88-90. This was because the A-1 and A-2 areas were considered the most contaminated and the Port contemplated that this material would be "capped" by less contaminated material from the Channel.

knowledgeable witness, the effect of his testimony is to leave in doubt his understanding of, or willingness to abide by, the regulations.[83/] He considers that the regulations confer broad discretion on the Regional Administrator in making determinations as to the suitability of materials for ocean disposal.[84/] For example, he testified that, at the various meetings where Battelle data were discussed, Corps representatives were informed that EPA would make its determination [as to the acceptability of Oakland Harbor sediments for ocean disposal] based on "best professional judgment," the regulations, the "Green Book" and input from

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[83/] Although no statistically significant differences in bioaccumulation potential between Oakland and Point Reyes' reference sediments were observed for mercury, PCB's and PAH's (Battelle Report at 3.46-3.49), Dr. Melzian stressed that mercury concentrations at TD-2 were 600 times higher than in the vicinity of the disposal site, that PCB concentrations were a 1,000 times higher and concentrations of PAH's were also substantially higher than at the disposal site (Vol. 7-142, 144-45, Vol. 8-53, 65, 89, 90, 116-18, Vol. 9-25-35). It is noted, however, that mercury concentrations at TD-2 were practically identical to mercury concentrations at Point Reyes (Battelle Report, Table K.1) and that the TRP expressed no concern over either mercury or PAH concentrations. Moreover, Dr. Melzian appeared to rely on AET's for some of his conclusions (Vol. 8-131-32, Vol. 9-176-83, 185-95), and, as we have seen (note 35, supra) AET's have not been accepted as a basis for making regulatory decisions and, it is unlikely that they will be.

[84/] Vol. 9-156-59. Because much of Dr. Melzian's testimony was admitted based on counsel's contention it was relevant to the gravity of the violation (Vol. 8-111-12), Complainant's view of the Administrator's authority is apparently more limited than Dr. Melzian's.

key people or experts within EPA.[85/] He apparently considers the "Green Book" as outdated and inadequate, for he emphasized that it was in the process of being revised. In other testimony, he denied that the "Green Book" established any "pass or fail" criteria [binding on the Regional Administrator] and asserted that EPA's independent evluation could include "state-of-the-art" knowledge about the potential for bioaccumulation and biological effects (Vol. 9-156-57). For these assertions, he relied on 40 CFR §§ 227.18 and 227.20 (Vol. 8-116-17, Vol. 9-152-54). Section 227.18 is in Subpart D, concerning the impact of the proposed dumping on esthetic, recreational and economic values and section 227.20 is in Subpart E, concerning the impact of the proposed dumping on other uses of the ocean.

58. Dr. Melzian testified that EPA's decision [that certain of the Oakland Harbor sediments were unsuitable for ocean disposal] was not based on any specific data set or point, but on all the data available (Vol. 9-84). He claimed that this approach was authorized by 40 CFR § 225.2, providing that the Regional Administrator will make an independent evaluation of proposed

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[85/] Vol. 7-177. This testimony confirms the Dillon/Wright memo (finding 16) and the testimony of Dr. Wright to the effect that EPA considered the "Green Book" to be outdated and inadequate for the evaluation of sediments for ocean disposal and that EPA had the authority to take a more "holistic" approach, placing major emphasis on sediment chemistry. Although Dr. Wright stated that the "Green Book" allowed for a certain degree of "professional judgment," this testimony related to statistically significant mortality reported for Rhepox and whether it was appropriate to consider Sequim Bay bioassay results (Vol. 17-178-80).

dumping. His chemical ranking system was, however, rejected as a basis for making regulatory decisions by the TRP (finding 19), by Dr. Wright (Vol. 17-79, 80, 119), by Dr. Pequegnat (Vol. 14-163-64) and by Messrs. Muir (Vol. 6-85) and Wastler (supra, note 36). This is because chemical data cannot be used to draw a statistical correlation with the degree of toxicity or the effect on resident biota.[86/] Nevertheless, Dr. Melzian insisted that sediment chemistry can be used to draw on inference as to whether there is a potential for toxicity or a likelihood that resident biota will be affected.[87/] As we have seen (finding 20), Dr. Melzian disagreed with the TRP's recommendation that materials represented by Sample SN-2 were suitable for ocean disposal. His recommendation was adopted by the Regional Administrator. Although no dredging occurred in the SN-2 area, this evidence

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[86/] Muir Interrogatories, No. 41, Gentile Interrogatories, No. 41 (Port's Exhs 112 and 115). Dr. Wright emphasized that concentrations of constituents cannot be directly interpreted as indications of potential toxic effects (Vol. 17-119). Dr. Pequegnat was familiar with the ocean dumping regulations and was emphatic that the regulations did not prohibit ocean disposal based on concentrations of a particular chemical (Vol. 14-21). A NOAA National Status and Trends Program report (Port's Exh 85) states that "(t)here are no reliable criteria with which to extrapolate levels of sediment contamination to the presence of biological effects and we cannot claim, a priori, that the areas found to be highly contaminated are necessarily places where biota have been affected" (Id. at 14).

[87/] Vol. 10-204. Dr. Wright described a similar inference by Mr. Muir as in the realm of "a warm, fuzzy feeling" (Vol. 18-57). He (Wright) testified that the purpose of chemical analysis was to determine if bioassays were required, and if so, the chemicals to look for (Id. 59).

is relevant, because it shows the Region's application (disregard) of the regulations. Dr. Melzian confirmed that his reasons for this conclusion were [his] chemical ranking system, AET values and toxicity data without consideration of initial mixing (Vol. 10-85-87). Table 4.1 of the Battelle Report confirms that the only statistically significant results in SN-2L sediments were reported in SPP bioassays which did not consider initial mixing.

59. According to Dr. Melzian, sediments at TD-2L would fail [the criteria for ocean disposal] even if SPP test results were disregarded due to LPC considerations and Rhepox "hits" were considered solely due to grain size, because of elevated levels of lead and TBT in clams, exposed to these sediments (Vol. 7-188). He acknowledged, however, that there were no established FDA action levels for lead (Vol. 9-65). Table 4.1 of the Battelle Report reflects that lead bioaccumulated to statistically significant levels in clam tissues as compared to Point Reyes in samples CH-1 and TD-2L.[88/] Dr. Wright testified that the TRP was aware of and discussed the statistically significant bioaccumulation of lead, but that it was not of great concern, because lead is ubiquitous and the

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88/ Bioaccumulated levels of lead in the tissues of the clam Macoma nasuta after ten-day exposure were .92 ug/g (wet weight) at TD-2L (average of three replicates) and .88 ug/g at CH-1 (Battelle Report, Tables 4.1 and K.1). This is to be compared with approximately .53 ug/g (average of three replicates) at Point Reyes. Sediment concentrations of lead at Point Reyes were, however, much lower 10 mg/k (ppm) as compared to 90 mg/k at TD-2L and 55 mg/kg at CH-1 (Table J.1).

levels shown were relatively low (Vol. 17-70, 71). He asserted that the range of lead concentrations reported here were within the range commonly seen in bioaccumulation studies (Vol. 18-90). Dr. Pequegnat agreed that the amount of lead in the A-2 area was not a cause for concern (Vol. 14-133-34). He pointed out that lead concentrations in the ocean are very low and that lead may be disposed of in the ocean under "special care," which could mean dredging. Although he recognized that lead was a problem on land, especially for children, he testified that the Scientific Group of the LDC agreed not to recommend that lead be moved to Annex I of the Convention for dredged materials, where it would be prohibited from disposal in other than trace amounts, because it was considered not to be a major contaminant (Id. 135-36). He stated that lead was tightly bound to, or sequestered by, clays such as montmorillonite which is the predominant clay in San Francisco Bay and that this would account for the proportional difference in uptake by clams when exposed to Point Reyes as compared to A-2 sediments (Id. 137). See note 88, supra.

60. Tributyltin and dibutyltin bioaccumulated to statistically significant levels in tissues of the clam Macoma nasuta after a 10-day exposure to sediments from the upper and lower levels of the TD-1 and TD-2 stations.[89/] Sediment concentrations of

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[89/] Battelle Report, Table 4.1. TBT concentrations ranged from 9.5 ug/k (ppb) (wet weight) to 22.4 ug/k and dibutyltin concentrations ranged from 2.2 ug/k to 3.2 ug/k (wet weight). TBT results were based on comparisons with Elkhorn Slough and (continued...)

TBT at Sediment Treatment TD-1U were 1601 ug/k, 2,214 ug/k in Sediment Treatment TD-1L, 235 ug/k in Sediment Treatment TD-2U and 603 ug/k in Sediment Treatment TD-2L (Battelle Report, Table J.1). According to Dr. Melzian, these TBT concentrations were from 600 to 3,000 times higher than TBT concentrations at Point Reyes or at the B1B sites (Vol. 8-24). He testified that TBT in the water can breakdown over a period of days or weeks and that TBT in the sediments has a half-life of 100-to-200 days (Id. at 26). He stated that TBT can leach out of the sediments into the water column and thus become potentially biovailable to animals in the water. He explained that studies have shown that TBT can bioaccumuoate in oysters, mussels, clams such as the Macoma used in the instant bioaccumulation test, striped bass, salmon and sea otters.

61. Dr. Melzian referred to a recent study (C's Exh 133), which reported what he characterized as "elevated" levels of TBT in Oakland Harbor waters of 26, 43 and 70 parts per trillion (ppt). These samples were drawn at depths of 0.3 of a meter near the shoreline rather than in the center of the channel (C's Exh 133, Figure 36). This resulted in reported TBT concentrations of 180 ppb in oysters and 3,600 ppb in mussels

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89/ (...continued)
dibutyltin results were based on comparison with CH-1 sediment. TBT was and is used as an antifoulant on the hulls of ships and boats. A statute, the "Organotin Antifouling Paint Control Act of 1988," P.L. 100-333 (June 16, 1988) bans the use of organotins on boats of less than 25 meters in length with specified exceptions and, inter alia, directs EPA to study the effects of the use of organotins on the environment and report the results to Congress.

exposed to Oakland Harbor waters for periods of up to five months. The mentioned study, conducted by the California Department of Game and Fish, characterized levels of TBT in the waters of Oakland Harbor as "low to moderate" and pointed out that, despite the growing evidence implicating TBT in causing toxicity problems, there was not much evidence linking environmental damage to TBT. To Dr. Melzian, however, the significant thing was that TBT bioaccumulated, i.e., concentrations of TBT in oyster and mussel tissues were higher than in the surrounding water (Vol. 8-33-36). He testified that exposure of oysters to Oakland Inner Harbor waters for a period of up to five months, resulted in no growth or abnormal growth of shells, referred to as "chambering." He referred to laboratory studies which reportedly show that TBT has had adverse effect on the immune system of mammals (Id. at 37-39). He stated tht EPA has issued an advisory recommending a [water quality] limit of ten ppt TBT.[90/] According to Dr. Melzian, oysters or mussels having TBT concentrations as high or higher than 20 ppb would not be safe to eat. This is based on a "reference dose" or an "acceptable daily intake," i.e., the

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[90/] Vol. 8-42, 43. Ambient Aquatic Life Water Quality Advisories For Tributylin (1987) (C's Exh 42). The advisory indicates that ambient TBT concentrations exceeding 0.026 ug/l in fresh water and 0.010 ug/l (10 ppt) in salt water should trigger one or more of several options, one of which is to reduce the ambient TBT concentration to an acceptable level. The California Department of Fish and Game study states that the State Water Quality Resources Board has proposed a recommended TBT water quality limit of six ppt (Id. at 7).

amount that could be consumed daily by a man weighing 70 kg in his life span without adverse effects. Summarizing, he concluded that TBT was bioavailable and it bioaccumulated to significant levels which appeared to be higher than considered safe to eat (Id. 40, 43-45).

62. Dr. Pequegnat asserted that high levels of organotins in sediments do not, a priori, indicate a significant adverse impact on the marine environment after ocean disposal (Vol. 14-97). A study, "Ecological Evaluation of Organotin Contaminated Sediment," by Salazar and Salazar (1985), (C's Exh 41), supports this statement. Even though the sediment concentration of bis (tri-n-butyltin) oxide (TBTO) in samples from Commercial Basin, San Diego Bay were reported as 780 ppb (TBTO concentrations in SPP and SP test water were reported as 0.49 ppb and 0.20 ppb, respectively) resulting in a concentration of TBTO of 2.82 ppm in clams (Macoma nasuta), no significant mortalities resulted. The Salazar study concluded that the material would qualify for ocean disposal under present guidelines administered by the EPA and the Corps of Engineers. Dr. Pequegnat indicated that there were possible causes, such as copper, for the "chambering" phenomenon observed in oysters and that TBT had not been established as the cause of this abnormality, which he described as "shell thickening" (Vol. 14-105-11, Vol. 15-28, 29, 31, 32). He cited a paper "Tributyltin And Water Quality: A Question Of Environmental Significance," by Salazar and Champ (1988)

(Port's Exh 120), which concluded that data relied upon by scientists and regulators for strict regulation of TBT were equivocal, that there were many interpretations of available data and that a true cause and affect relationship between TBT, and shell thickening and reduced growth in oysters has not been proven.

63. Dr. Pequegnat regarded the California Fish and Game study, relied on by Dr. Melzian, as essentially irrelevant to dredged material, because it concerned TBT concentrations in the water rather than in sediments and because the samples were taken very near the surface and in "slips for boats" (Vol. 14-114-16). He asserted it was obvious they were trying to obtain the highest possible levels of TBT (Vol. 15-89). He criticized the cited study, because there was no measurement [of the concentration] of any other antifoulant paint, such as copper [which could have caused the reported chambering] (Vol. 14-111). He opined that this created a "worst-case" situation with no particular relevance to this case. He pointed out that the degradation of TBT was quite rapid and that dibutyltin was less toxic than TBT (Id. at 125). He emphasized that no correlation between TBT concentrations and mortality was shown in the Battelle Report (Id. at 117). This was because Rhepox survival was greater where TBT concentrations in sediments were the highest, e.g., at TD-1 as compared to TD-2.

64. Dr. Pequegnat acknowledged that the fact organisms exposed to TD-2 sediments bioaccumulated TBT indicates that TBT is available in the water column (Vol. 15-8, 9). He explained, however, that whether TBT in the sediments was available to the water column, depended on the nature of the sediments and, if TBT were bound to a particulate, it could be considered harmless, because it would not be bioavailable (Id. at 26, 35). He testified that the predominant clay in San Francisco Bay is montmorillonite and that this material has the capacity for picking up positive ions referred to as "cations" and that most toxic metals are carried as cations (Vol. 14-44). In other testimony, he explained that the tightness of the bonding of, for example, TBT to particulates, referred to as sequestering, would depend on the pH and EH or "redox."[21/] The bonding would be the tightest in anaerobic conditions and less under aerobic conditions (Id. at 47). He characterized sediments in the Channel as anerobic and stated that, while this might change during the brief transit [of dredged material] in the water column, it would not take long for anoxic conditions to be reestablished after the material reached the bottom (Id. at 49). Dr. Pequegnat acknowledged

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[21/] Vol. 15-38, 39. Dr. Pequegnat defined "redox" as simply a way of measuring whether an environment was oxidizing or reducing [oxygen] (Vol. 14-32). "Redox" is generally measured in mmillivolts, for example, 500+ being a very oxidizing environment, while -400 millivolts would be a reducing environment. In other testimony, he agreed that "redox" could be characterized as the boundary between aerobic and anaerobic conditions (Vol. 15-41).

that salinity affected bioavailability and that, if material dredged from fresh water were placed in the sea, there was a good chance that metallic cations would be displaced by sodium ions (Id at 59, 60). He pointed out, however, that the difference between ocean water at approximately 35 parts per thousand sodium chloride and Oakland Harbor water at approximately 26 parts per thousand was not that great.

65. Dr. William H. Patrick,, Professor of Marine Sciences and Director of the Laboratory for Wetland Soils and Sediments at Louisiana State University and an expert witness for the Port, testified that the potential biological effects of a given chemical were definitely related to the medium or carrier in which the chemical was contained.[92/] Based on a dredged material study by the Corps and data available for this case, he described Oakland Inner Harbor sediments as comprised of 30 to 45 or 50 percent clay, a large amount of silt and a relatively small amount of sand (Vol. 21-99,100). He described the clay as predominantly montmorillonite, having a high surface exchange activity and as being finely divided. He testified that these properties of clay help to bind toxic heavy metals. This binding process is sometimes referred to as "cation exchange." Pointing out that the organic matter content of Oakland Inner Harbor sediments was in the range of four percent, he stated that organic matter was also finely

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92/ Vol. 21-98. Dr. Patrick's specialization is in the oxidation reduction chemistry of wetland systems (Id. at 94, 95).

divided and surface active and had a tendency to bind constituents. This "sequestering" process is related to negative charges (anions) that occur in organic matter (Id. at 101). Dr. Patrick indicated he was speaking specifically of toxicated metals. Additionally, he pointed out that estuarine and ocean sediments have a high amount of sulfate and that under conditions at the bottom of the water column where oxygen is limiting, microorganisms will convert sulfate into hydrogen sulfide which has an extremely high affinity for toxic heavy metals. He explained that some of the most insoluble chemicals in nature were sulfides.

66. Dr. Patrick testified that most of the heavy metals have a high bonding energy, pointing out that cadmium is the least tightly bonded of "normal heavy toxic metals" and that lead would be very tightly bonded (Id. at 106). Although Dr. Patrick acknowledged that Table 4.1 of the Battelle Report showed that lead bioaccumulated to statistically significant levels [at Sites CH-1 and TD-2L], he denied that this was environmentally significant, because the lead content of the Oakland Inner Harbor was lower than that in pristine marshes in the South Bay area.[93/] He stated that the lead content in a pristine salt marsh near Bomberg in Alameda County, which

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[93/] Vol. 22-54. This supports the testimony of Dr. Wright (finding 59) that the concentrations of lead were relatively low. See also note 23, supra, indicating lead level limits for ocean disposal recommended by the LDC are 500 mg/kg. The TRP also considered lead not to be a problem.

was not near any industrial development, was over 150 ppm as compared to only 90 ppm at TD-2L (Vol. 22-58, Battelle Report, Table J.1). He considered the latter level as not even nutritionally important. Asked whether he would have any hesitation in serving human beings clams having a lead concentration of .92 ppm, Dr. Patrick replied that most humans who eat Macoma clams are served with lead concentrations in that range.[94/]

67. Asked specifically about the effect of Oakland Inner Harbor clays and organics on TBT, Dr. Patrick answered that the mechanism involved in the "fixation" or binding of TBT wasn't known (Vol. 21-103). He emphasized, however, that it is known that sediments containing appreciable amounts of clay and organics can tie up or bind TBT to a much greater extent than coarser sediments having low organic matter. In further testimony, he agreed with Dr. Melzian that TBT concentrations

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[94/] An objection to questions based on purported lead limits in fish and seafood established by other countries was sustained as not relevant (Vol. 22-59). In post-hearing submissions, Complainant has renewed its argument and offered an exhibit purporting to establish lead limits imposed by Canada, Germany and other nations (Notice Of Lodging Of Complainant's Exhibit No. 184, Errata To Complainant's Exhibit No. 151). It is argued, inter alia, that the views of foreign governments and their regulatory scientists are relevant to a determination by a U.S. agency of what levels of lead exposure are safe. This misstates the issue for the Regional Administrator's function under the regulations is not to determine in the abstract what levels of lead exposure might be safe, but to determine whether the "criteria" for ocean dumping have been met. The views of foreign governments are not relevant to this issue and the ruling made at the hearing is affirmed. Exhibit No. 184 is rejected as an exhibit and is not admitted into evidence.

at the TD stations as shown in the Battelle Report were relatively high (Id. at 113-14). He stated, however, that TBT levels as shown in bioaccumulation tests were among the lowest which have been reported in organisms (Id., Vol. 22-10). Moreover, he pointed out that two stations, i.e., TD-1U and TD-1L, having TBT concentrations of 1601 ug/kg and 2214 ug/k, respectively, had higher concentrations than TD-2L showing 603 ug/kg), but did not show significant toxicity (Vol. 21-172). Referring to the study involving Commercial Basin in San Diego Bay by Salazar & Salazar (C's Exh 41), Dr. Patrick noted that, although sediment concentrations of 780 ppb were less than those reported at the Oakland TD stations, bioaccumulation after a 20-day bioassay was reported as 2,800 ppb, over 100 times as much as reported at the TD stations. To Dr. Patrick, two things were obvious: one is that clams have a capacity for a high uptake of TBT and second, that the availability of TBT in Oakland Inner Harbor as measured by bioaccumulation is much less than in San Diego Bay sediments (Id. 115-116). He attributed this to the high clay and organic content of Oakland Inner Harbor sediments, noting that the clay content of San Diego Bay sediments [as reported in Complainant's Exhibit 41] was 14 percent. He estimated that the TBT concentration in tissues would roughly double, i.e., from 20-to-40 ppb at TD-1 sites and from 10-to-20 ppb at TD-2 sites, if bioassays using TD sediments were run for a period of 20 days as were the referenced bioassays involving San Diego Bay

sediments (Id. at 119-22). He testified that these were still low levels as compared to general TBT levels reported in clams and oysters which apparently have not created toxicity problems.[95/] In other testimony, he pointed out that TBT was ubiquitous in coastal waters, and that many organisms have levels of TBT [in their tissues] which have not been associated with mortality or sublethal effects (Vol. 22-12).

68. Dr. Patrick acknowledged that disposal of Oakland Inner Harbor sediments from a scow into the ocean would allow the material to interact with the water column and thus increase the bioavailability of TBT. He calculated the amount of TBT released into the water column during disposal of unpermitted sediments at the B1B site as .008 lbs, assuming a 10^3 mixing ratio (Vol. 21-123-28; Port's Exh 142). This calculation was made based on the assumption that 8,000 cubic yards of unpermitted materials were disposed, that 4,000 cubic yards of this material were contaminated, that the maximum concentration of TBT in the mixed material was one-half ppm,

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[95/] Dr. Patrick cited a study "Tributyltin Contamination in Bivalves from United States Coastal Estuaries" by Wade et al. (1988) (Port's Exh 141), which indicates TBT concentrations in mussels and oysters of from less than 5 to 1560 (366 average) ng of $Sn\text{-}g^{-1}$ dry weight as tin and account on average for 74 percent of the tin present as butyltins. He pointed out that these results were not immediately comparable to the results in the Battelle Report and the Salazar study, because of being reported in nanograms of tin per gram or ppb, rather than of TBT. He also noted that the results were reported on a dry rather than a wet weight basis. He explained that to convert to a wet weight basis, it was necessary to multiply by .2 and that to convert to a TBT from tin, it was necessary to multiply by five (Vol. 21-118).

equivalent to one ppm in the contaminated material and that there was complete dispersion of the material as it fell through the water column. He characterized these assumptions as conservative and stated that this last assumption was not true, because clamshell dredge materials tend to fall in clumps, particularly in the case of clay sediments, which would be highly aggregated. Using the mixing ratio calculated by the Corps, he determined that the average TBT concentration in the water column at the disposal site [from disposal of Oakland Inner Harbor material] would be one-thousandth of a part per million, which is one-tenth the EPA Water Quality Advisory (Id. at 127). He opined that the environmental impact of TBT in the water column at the disposal site would be relatively minor. Moreover, he pointed out that dissolved TBT is very degradable, having a half life in the water column of about 16 days, i.e., half of the material would be gone in 16 days and in another 16 days, half of the remainder would be gone (Id. at 132). Accordingly, after 10 to 20 days, the water column concentration of TBT would not even be one-thousandth part per billion. Dr. Patrick agreed with Dr. Pequegnat that the increase in salinity from Oakland Harbor of approximately 25 parts per thousand to the ocean of approximately 35 parts per thousand would increase the release rate of TBT (Id at 130-31). However, he estimated the increase in release rate at no more than 15 percent and opined that it would have no measurable effect.

69. Dr. Patrick testified that the ratio of TBT in the sediments to that in the water column immediately above the sediment usually ranges from one-thousand-to-one to four- or five-thousand-to-one (Vol. 22-17). He emphasized, however, that the normal distribution between the solid and soluble phase did not seem to hold for Oakland Inner Harbor sediment (Id. 20, 21). He attributed this to the fact Oakland sediments tend to hold the TBT in a form that is not bioavailable. To Dr. Patrick proof of this was in the ten parts per billion shown in the test organisms for the TD stations. While acknowledging that the tissue concentration might double [if the test were run for 20 days instead of ten], he asserted that was still only one percent of the uptake obtained by Salazar in sediments [from San Diego Bay] where the TBT concentration was known. He opined that the statistically significant differences in TBT bioaccumulation shown in the Battelle Report were due to the fact that the different replicate [tests] were very close to each other (Id. at 22). He did not think it was due to a physiological difference or an ecological difference in uptake, because these were some of the lowest TBT values that have been reported. He stated that test organisms exposed to the water column accumulate much more TBT and that this fact was one of the most unusual features of the Battelle study. He acknowledged that the degradation rate of TBT in the sediment was considerably lower than in the water column, having a half life of about half a

year (Vol. 21-132-33). He explained that in half a year, one-half of the TBT would be degraded into less toxic forms such as dibutyl, monobutyl and the metal tin itself. Thus, if eight pounds of TBT were in the materials dumped at the B1B site, it would [at the time of the hearing] have been reduced to approximately two pounds. According to Dr. Patrick, because of its relatively short half life, the best way to treat TBT as a toxic was to stop using it. He testified that, although TBT bioaccumulates, it does not biomagnify, i.e., increase in concentration as it moves up the food chain. The reason for this is the apparent ability of organisms to degrade TBT in their tissues (Id. at 134-35).

70. Notwithstanding the fact Complainant was well aware that there was a substantial issue as to whether the Rhepox mortality shown in the Battelle Report was attributable to grain size rather than toxicity, Complainant contented itself at the hearing with a regression analysis prepared by Dr. Richard C. Swartz of EPA's Research Laboratory in Newport, Oregon (supra at note 29), which purports to show no correlation between Rhepox mortality and grain size (C's Exh 132). Dr. Swartz did not appear as a witness and this document is in evidence only because counsel for Respondents withdrew their objections.[96/] In any event, this purported regression analysis was

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[96/] The objections were withdrawn based in part on representations that the Battelle Report was the only document used in the preparation of the regression analysis.

thoroughly discredited at the hearing. Dr. Wright testified that Dr. Swartz's regression analysis could not be used to draw conclusions [as to whether Rhepox was responding to changes in grain size], because it incorrectly assumed that the only variable was a change in the percentage of sand, when in fact there were also large changes in the ratio of silt and clay [between various test stations in the Battelle Report] (Vol. 17-175). He pointed out that with the scatter of data points shown on the graph prepared by Dr. Swartz and a sample size of 18, the line reflecting percent survival could have been drawn in several directions [locations] and that he would not expect to find a relationship.[97/] Dr. Pequegnat testified that in order to do a proper regression analysis, a complete grading was necessary, i.e., from five percent fines as shown at Point Reyes to 90 to 95 percent [shown at some Oakland Inner Harbor stations (Vol. 15-133-34). To Dr. Pequegnat, a sampling of from 60 percent fines to approximately 95 percent fines was simply not adequate.[98/]

[97/] Vol. 17-169-170. Moreover, he asserted that finding a correlation, did not imply cause and effect. If finding a correlation does not imply a cause and effect, failure to find a correlation between mortality and grain size does not establish that Rhepox was responding to toxicity rather than grain size.

[98/] As compelling evidence that Rhepox was attempting to move out of sediments it didn't like, Dr. Pequegnat cited the number of this organism shown on the sediment surface in Table I.1 of the Battelle Report (Vol. 14-84, 85). He opined that this number was disproportionately high [in the samples containing a high percentage of fines] and noted that Rhepox seemed at home in Point Reyes sediment (Id. at 85, 86).

Dr. Patrick agreed with Dr. Pequegnat, pointing out that, while the regression analysis (C's Exh 132) did not show a significant correlation between the percent fines and Rhepox survival, the exhibit only covered a narrow range from approximately 62 percent to approximately 96 percent fines. He asserted that in order to determine if a relationship between percent fines and Rhepox survival exists, there must be a continuous gradation of points over the entire range.[99/]

71. Table 3.19 of the Battelle Report is entitled "Comparison of Percent R. abromius Surviving for all Sediment Treatments." The Table indicates 62 percent survival at Sediment Treatment 3-2, 64 percent at SN-3L, 65 percent at 3-1 and 68 percent survival at Sediment Treatment TD-2L. The percent of Rhepox survival for these sediment treatments changed by from 25 percent to 31 percent (inverse order) when compared to Point Reyes. These were the only statistically significant differences in survival noted in the Battelle Report (Table 4.1). The percent survival for the mentioned stations changed

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[99/] Vol. 21-136-37. Dr. Wright testified that at the second TRP meeting Dr. Gentile reported that he had attempted to perform a regression analysis of Rhepox mortality as related to percent fines using data in the Battelle Report, but had been unable to find any correlation, because the sample size was too small (Vol. 17-101-04). Dr. Wright pointed out, however, that such a relationship was clearly established in a graph "Pudget Sound Urban Sediments" (Port's Exh 144) from the DeWitt, Dittsworth and Swartz paper (Port's Exh 128), which shows Rhepox survival decreased as the percent fines increased. Using a sample size of 20 animals, his interpretation of the graph was that two would be lost as a direct function of grain size as the percentage of fines increased from five to 80 percent.

from 14 percent to 20 percent when compared to Sequim Bay, none of which are statistically significant. Table 3.31 of the Battelle Report reflects that Sediment Treatment 3.2 consisted of 17.77 percent sand, Sediment Treatment SN-3L consisted of 22.84 percent sand, Sediment Treatment 3-1 consisted of 22.12 percent sand and Sediment Treatment TD-2L consisted of 33.62 percent sand, while the Point Reyes reference consisted of 94.52 percent sand and the Sequim Bay sediment consisted of 27.84 percent sand. Using an equation from the DeWitt, Ditsworth, Swartz paper (Port's Exh 128), which he testified showed a two-and-a-half percent decrease in Rhepox survival for every ten percent increase in fines, Dr. Patrick corrected the percent of survival for the mentioned Oakland Inner Harbor sediment treatments for the 5.44 percent fines at Point Reyes (Vol. 21-142-44; Port's Exh 145). He also corrected the Point Reyes reported survival of 93 percent using the 72.19 percent fines shown at Sequim Bay. This resulted in Rhepox survival of from 76 to 80 percent for the listed Inner Harbor treatment sediments and a survival rate of 75 percent for Point Reyes reference sediment. This, of course, eliminated any statistically significant differences in mortality. Because the Sequim Bay sediments were reportedly clean and uncontaminated, Dr. Patrick testified that the differences in mortality should in a general way be related to the differences in the percentage of fines (Id. at 144).

72. Because counsel for Complainant complained that his cross-examination of Dr. Patrick was unfairly limited by Dr. Patrick's schedule, Complainant was permitted to file an affidavit to rebut certain of Dr. Patrick's calculations.[100/] Reduced to essentials, the declarations of Drs. Swartz and DeWitt (note 99, supra) are to the effect that it is inappropriate to use the equation from their study (Port's Exh 128) to correct Rhepox survival results as shown on Table 3.19 of the Battelle Report for percentage of fines as Dr. Patrick has done on Port's Exhibit 145, because the test protocols used in the studies are substantially different and direct comparisons are not possible. They assert that a correct use of the equations and model developed in their study would be to plot the unaltered Rhepox results from the Battelle Report on Figure 3, attached to their declarations, which assertedly shows that the mean survival is below the 95 percent prediction limit and thus mortality of test organisms is probably not a function of percent fines alone. They therefore assert that their model, if it could be applied to Battelle study results, would indicate that, while particle-

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[100/] Vol. 22-6, Vol. 25-74. Complainant has attempted to expand this authorization far beyond its scope, filing declarations of Drs. Richard C. Swartz and Theodore DeWitt and Harry Seraydarian along with two studies, dated 1975 and 1977 (proposed exhibits 182 and 183), purporting to characterize sediments in San Francisco Bay. The declarations of Messrs. Swartz and DeWitt are in substance identical and are accepted. Mr. Seraydarian declined to be deposed or to appear as a witness and his declaration along with the mentioned studies are rejected and not admitted into evidence.

size associated factors might account for some of the observed mortality, chemical contamination cannot be ruled out as a cause of the reported mortality.

73. As contemplated at the hearing, Dr. Patrick filed a rebuttal declaration, emphasizing that the mortality of Rhepox in Oakland Inner Harbor sediments with high contents of fines was only marginally higher than the mortality observed in the coarse textured Point Reyes sediment, being statistically significant at TD-2L by only one percentage point, and that application of less than one-half of the correction obtained by use of the DeWitt-Swartz equation would make all of the comparisons statistically nonsignificant. Dr. Patrick further emphasized that the DeWitt-Swartz paper shows that grain size has a definite effect on Rhepox survival and opined that this effect could not properly be ignored in comparing Oakland Inner Harbor results with coarse referenced Point Reyes sediment. Dr. Patrick stated that the differences in test protocols between the Battelle Report and the DeWitt-Swartz paper appeared to be minor and noted that they characterized the significance of such differences by words such as "possibility" and "might have." Quoting passages from his testimony, Dr. Patrick denied testifying that Rhepox mortality in Oakland Inner Harbor sediments as shown in the Battelle Report was solely due to grain size. He pointed out, however, that the DeWitt-Swartz equation and the Sequim Bay fine control sediment indicate that it is very unlikely that the

small difference in Rhepox mortality between Station TD-2L and Point Reyes observed in the test is meaningful.[101/]

C O N C L U S I O N S

1. Because the evidence allegedly supporting two of the additional counts in the second amended complaint was admitted based on Complainant's argument the evidence was relevant to the amount of an appropriate penalty, Complainant may not now shift ground and claim that an amendment is proper in order to conform the complaint to the proof. Moreover, none of the counts against Great Lakes in the second amended complaint have been substantiated. Accordingly, leave to file the second amended complaint should, and will, be denied.

2. Although the validity of the Regional Administrator's determination that certain of the Oakland Inner Harbor sediments were unsuitable for ocean disposal may not be

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[101/] Complainant is correct that Point Reyes sediments are similar to sediments at the disposal site and for that reason Point Reyes was an appropriate reference. Sequim Bay sediments are not similar to those at the disposal site and for this reason Sequim Bay would not be an appropriate reference. It is clear, however, that Sequim Bay sediment more nearly approximates Oakland Inner Harbor sediments in the percentage of fines and the issue is whether the Sequim Bay results can properly be disregarded as Complainant would have it. Although it is not altogether clear, Sequim Bay was apparently included as a control because Point Reyes sediment was not similar to that in the Oakland Inner Harbor. Complainant and its witnesses have made much of the fact that there is no record of the Port or the Corps objecting to the use of Rhepox as a test organism. By the same token, there is no evidence of EPA objecting to use of Sequim Bay as a control. The unrebutted testimony of Drs. Wright, Pequegnat and Patrick is that it would be unreasonable to disregard the Sequim Bay results in view of the evidence that Rhepox is affected by grain size and that testimony is accepted.

administratively contested, the factual basis for such determination is relevant to the gravity of violations for unpermitted dredging and dumping. Because the evidence establishes that the dredged materials could appropriately have been determined to be suitable for ocean disposal, a grave or serious violation of the Act has not been established.

3. Although the evidence establishes that at least three of the six scow loads dumped at the B1B site were not within limits set by the permit, under the circumstances present here, which include the fact that the precise navigation contemplated by the permit for the dumping of materials in the ocean was experimental and that Great Lakes was making good faith efforts to comply, imposition of a penalty for failure to comply with the permit in this respect is unwarranted.

4. Section 105 of MPRSA providing that gravity of violation is among factors considered in determining the amount of penalty for violations of the Act is considered from two aspects, i.e., gravity of harm or potential harm and gravity of misconduct and, inasmuch as gravity of harm and gravity of misconduct are both slight, a serious violation of the Act has not been established. Accordingly, the severe penalty sought by Complainant is not warranted.

D I S C U S S I O N

A. Proposed Second Amended Complaint

As indicated (finding 55), paragraph 10 of the proposed second amended complaint charges Great Lakes with intentionally dredging unpermitted sediments from ten-to-twenty south of the southern boundary of the Federal Channel in the A-2 area and disposing of the material at the B1B site. The contract, however, specified that all material which sloughs into areas to be dredged from outside the dredge limits at the Turning Circle was to be removed prior to the acceptance of the work. Although this provision was drafted on the assumption the A-1 and A-2 areas were to be dredged first, the parties reasonably interpreted this provision as governing acceptance of the work in the Turning Basin until authorization to dredge the A-1 and A-2 areas was given. The Port expected "grade at the Channel line" and under these circumstances, established clamshell dredging practices and limitations made it reasonable, if not necessary, for Great Lakes to dredge a slope at the Channel line (finding 56). The permit may not be interpreted in isolation, but must be viewed in the light of established dredging practices and limitations. Moreover, as the Corps pointed out "slideslope material along the Federal Channel through the proposed turning circle is of new origin" and is not material considered by the Corps/EPA TRP (supra at note 81). Therefore, it is concluded that there is no basis for augmenting the proposed penalty for alleged intentional dredging into the prohibited A-2 area.

Count 4 of the second amended complaint alleges that on May 15 and 16, 1988, Respondents, now solely Great Lakes, intentionally dredged sediments from the A-2 area in the vicinity of and west of a line identified as Station 182+ 00 on Great Lakes' pre- and post-dredge survey charts. This allegation is apparently based on some vague testimony by Messrs. Duffy and Hilgendorf (e.g., note 63, supra) that dredging occurred south of the Federal Channel line at the mentioned station. This area corresponds with the "node" area and the testimony of Mr. Sullivan that no additional dredging occurred south of the Federal Channel line in the "node" area has been accepted (findings 38 and 39). Moreover, even if some additional dredging in the "node" area occurred, materials from such dredging would have constituted Load No. 7, which was not disposed of at the B1B site. Accordingly, the environmental harm from such unpermitted dredging would not be significant.

As we have seen (supra at note 79), evidence that Great Lakes violated the provision of the permit prohibiting overflow of dredged material from the scows and dredged deeper than the minus 39 feet MLLW authorized by the permit was admitted based upon counsel's argument it was relevant to the amount of the penalty. Notwithstanding this circumstance, Complainant now seeks to amend the complaint to include Counts 10 and 11, charging Great Lakes with spillage over the side of a scow during loading and during the transport of Load No. 4 to the dump site, and Counts 12 through 16, charging Great Lakes with dredging deeper than the minus 39 feet MLLW authorized by the permit, upon the contention such an

amendment is proper in order to conform the complaint to the proof. Having argued and succeeded in its contention that the evidence is admissible for a limited purpose, Complainant is bound by the choice made. Because counsel for Great Lakes repeatedly affirmed his objection that the evidence was not relevant to any pending charge against Respondents, this is not a case where issues beyond the scope of the pleadings were tried with the consent of the parties. Accordingly, leave to file the second amended complaint in this respect will be denied and consideration of the evidence will be limited to the purpose for which offered, i.e., determination of the amount of an appropriate penalty.

The permit provision prohibiting overflow was intended primarily to prohibit overfilling of the scows and loss of dredged material over the sides while in transit to the disposal site (finding 53) The muddy water or slurry observed flowing over the gunwale of a scow or scows in videotapes of the Great Lakes' dredging and loading operation is not dredged material and is not a violation of the overflow provision, because muddy water in the scow will normally be displaced by material dredged by clamshell in the course of loading, in which case the water will flow over the gunwales (Id.). Evidence that the "no overflow" provision was violated is therefore limited to an observation in a Daily Report, by Mr. James Ramber, an inspector for Sea Surveyor, who did not appear as a witness, that two feet appeared to be missing from the top of Load No. 4 as they approached the dump site (finding 50).

This evidence is simply too slender a reed upon which to premise any augmentation of the proposed penalty.

Complainant's contention that dredging deeper than the minus 39 MLLW authorized by the permit is a permit violation is simply another instance of Complainant's lack of understanding of, or refusal to recognize, clamshell dredging practices and limitations. The evidence shows that the bottom surface after clamshell dredging is essentially an "egg carton" have high spots and low spots and that the practice is to sweep the bottom with the dredge bucket in order to smooth the surface (finding 54). The evidence also shows that a one-foot overdepth or tolerance is nearly impossible to meet on a job this size and that the contractor is not expected to meet this limit "bucket-by-bucket." The minus 39 feet MLLW is then simply a limit for pay purposes and dredging deeper than that depth is not a violation of the permit (Id.). Moreover, the dredging was halted by a court order and there is no showing that Great Lakes had completed its sweeping operations in areas Complainant now claims to have exceeded the permit limit. For all these reasons, Complainant's contention that evidence Great Lakes dredged deeper than authorized by the permit increases the seriousness or gravity of the violations herein shown and increases the penalty therefor is rejected.

Complainant's motion for leave to file a second amended complaint will be denied. The Complainant's contention that matters alleged in the proposed second amended complaint increase

the gravity of the violations and thus provide a basis for augmenting the penalty is also rejected.

B. Regional Administrator's Unsuitable Determination

As indicated, supra at 7, the validity of the Regional Administrator's determination that sediments from the A-1 and A-2 areas in the Turning Basin of the Oakland Inner Harbor were unsuitable for ocean disposal may not be administratively contested and is not directly in issue. Nevertheless, where the gravity of violations for unpermitted dredging and ocean disposal is in issue, evidence of the factual basis for the Regional Administrator's determination is relevant and admissible.[102/] This is especially true where, as here, the Regional Administrator has given damage to the government program, i.e., loss of confidence in the government, as one of his reasons for his view the violations were grave,

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[102/] While the result arguably would be otherwise, if the Regional Administrator's determination were discretionary, the Regional Administrator, no less than the District Engineer, is bound to apply the "criteria." It is recognized that ¶ 7 of the Introduction to the "Green Book" states that the decision on granting a permit is ultimately subjective. The mentioned paragraph goes on to state, however, that the criteria do not prohibit environmental change, but rather "unacceptable environmental impact." The conclusion that the decision as to whether to grant a permit is subjective overlooks or ignores 40 CFR § 227.4 which indicates that, if the applicable prohibitions, limits and conditions are satisfied, the finding that no unacceptable environmental impact will result has already been made (infra 119). See also § 227.2. It is also recognized that the preamble to the regulation, 42 Fed. Reg. 2167 (January 11, 1977), provides that the Regional Administrator will have discretion to determine what is an unacceptable hazard to fishing, navigation, shorelines and beaches pursuant to 40 CFR § 227.10. The Regional Administrator must, however, act reasonably and there is no indication that this provision was or could be, properly invoked here.

warranting the highest penalties permitted by the Act (findings 40 and 41).

Section 103(b) of MPRSA (33 U.S.C. § 1413(b)) makes it clear that in determining whether to issue a permit for the ocean disposal of dredged material the Secretary [of the Army] is to apply the criteria established by the Administrator pursuant to Section 102 of the Act. Section 103(c) makes it equally clear that in determining whether to concur in such a permit, the Administrator/Regional Administrator is also to apply the criteria.[103/] If the "criteria" have been met, the Regional

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[103/] MPRSA Section 103(c) provides:

> (c) Disagreement of Administrator with determination of Secretary of the Army
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> Prior to issuing any permit under this section, the Secretary shall first notify the Administrator of his intention to do so. In any case in which the Administrator disagrees with the determination of the Secretary as to compliance with the criteria established pursuant to section 1412(a) of this title relating to the effects of the dumping or with the restrictions established pursuant to section 1412(c) of this title relating to critical areas, the determination of the Administrator shall prevail. Unless the Administrator grants a waiver pursuant to subsection (d) of this section, the Secretary shall not issue a permit which does not comply with such criteria and with such restrictions.

Additionally, 40 CFR § 225.2(c), (d) and (e) provide:

> (c) Using the information submitted by the District Engineer, and any other information available to him, the Regional Administrator will within 15 days after receipt of all requested information, make an independent evaluation of the proposed dumping in accordance with the criteria and respond to the District Engineer pursuant to paragraph (d) or (e) of this section. The Regional Administrator may request an extension of this 15 day

(continued...)

Administrator has no discretion, but to concur in the permit. The criteria for dredged material consists of 40 CFR §§ 227.1(b), 227.4, 227.5, 227.6, 227.9, 227.10, 227.13 and Subparts C, D, E and G of Part 227; 40 CFR §§ 228(4)(e), 228.9 and 228.12 and the "Green Book."

40 CFR Part 227 is entitled "Criteria For The Evaluation Of Permit Applications For The Ocean Dumping Of Materials" and is applicable to materials in addition to dredged materials. Section 227.1 is in Subpart A entitled "General"[104/] and Section 227.1(b) provides:

> (b) With respect to the criteria to be used in evaluating disposal of dredged materials, this section and Subparts C, D, E, and G apply in their entirety. To determine whether the proposed dumping of dredged material complies with Subpart B, only §§ 227.4, 227.5, 227.6, 227.9, 227.10 and 227.13 apply. An applicant for a permit to dump dredged material must comply with all of Subparts C, D, E, G and applicable sections of B, to be deemed to have met the EPA criteria for dredged material dumping promulgated pursuant to section 102(a) of the

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[103/](...continued)
period to 30 days from the District Engineer.

> (d) When the Regional Administrator determines that the proposed dumping will comply with the criteria, he will so inform the District Engineer in writing.
>
> (e) When the Regional Administrator determines that the proposed dumping will not comply with the criteria he shall so inform the District Engineer in writing. In such cases, no Dredged Material Permit for such dumping shall be issued unless and until the provisions of § 225.3 are followed and the Administrator grants a waiver of the criteria pursuant to § 225.4.

[104/] References are to the regulations in 40 CFR Part 227 (1990). Insofar as pertinent here, these regulations have not been revised since their promulgation in 1977.

> Act. If, in any case, the Chief of Engineers finds that, in the disposition of dredged material, there is no economically feasible method or site available other than a dumping site, the utilization of which would result in noncompliance with the criteria established pursuant to Subpart B relating to the effects of dumping or with the restrictions established pursuant to section 102(c) of the Act relating to critical areas, he shall so certify and request that the Secretary of the Army seek a waiver from the Administrator pursuant to Part 225.

Additionally, 40 CFR § 227.2 is entitled "Materials which satisfy the environmental impact criteria of Subpart B" and provides in pertinent part:

> (a) If the applicant satisfactorily demonstrates that the material proposed for ocean dumping satisfies the environmental impact criteria set forth in Subpart B, a permit for ocean dumping will be issued unless:
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> (1) There is no need for the dumping, and alternative means of disposal are available, as determined in accordance with the criteria set forth in Subpart D; or
>
> (2) There are unacceptable adverse effects on esthetic, recreational or economic values as determined in accordance with the criteria set forth in Subpart D; or
>
> (3) There are unacceptable adverse effects on other uses of the ocean as determined in accordance with the criteria set forth in Subpart E.

Subpart B is entitled "Environmental Impact" and § 227.4 entitled "Criteria for evaluating environmental impact" provides:

> This Subpart B sets specific environmental impact prohibitions, limits, and conditions for the dumping of materials into ocean waters. If the applicable prohibitions, limits, and conditions are satisfied, it is the determination of EPA that the proposed disposal will not unduly degrade or endanger the marine environment and that the disposal will present:
>
> (a) No unacceptable adverse effects on human health and no significant damage to the resources of the marine environment;

(b) No unacceptable adverse effect on the marine ecosystem;

(c) No unacceptable adverse persistent or permanent effects due to the dumping of the particular volumes or concentrations of these materials; and

(d) No unacceptable adverse effect on the ocean for other uses as a result of direct environmental impact.

Section 227.6 is entitled "Constituents prohibited as other than trace contaminants." Section 227.6(a) provides essentially that dumping of the following constituents on other than an emergency basis will not be approved: (1) organohalogen compounds; (2) mercury and mercury compounds; (3) cadmium and cadmium compounds; (4) oil of any kind or in any form; and (5) known carcinogens, mutagens, or teratogens or materials suspected to be carcinogens, mutagens, or teratogens by responsible scientific opinion.

Section 227.6(b), (c) and (d) provide:

(b) These constituents will be considered to be present as trace contaminants only when they are present in materials otherwise acceptable for ocean dumping in such forms and amounts in liquid, suspended particulate, and solid phases that the dumping of the materials will not cause significant undesirable effects, including the possibility of danger associated with their bioaccumulation in marine organisms.

(c) The potential for significant undesirable effects due to the presence of these constituents shall be determined by application of results of bioassays on liquid, suspended particulate, and solid phases of wastes according to procedures acceptable to EPA, and for dredged material, acceptable to EPA and the Corps of Engineers. Materials shall be deemed environmentally acceptable for ocean dumping only when the following conditions are met:

(1) The liquid phase does not contain any of these constituents in concentrations which will exceed applicable marine water quality criteria after allowance

for initial mixing; provided that mercury concentrations in the disposal site, after allowance for initial mixing, may exceed the average normal ambient concentrations of mercury in ocean waters at or near the dumping site which would be present in the absence of dumping, by not more than 50 percent; and

(2) Bioassay results on the suspended particulate phase of the waste do no indicate occurrence of significant mortality or significant adverse sublethal effects including bioaccumulation due to the dumping of wastes containing the constituents listed in paragraph (a) of this section. These bioassays shall be conducted with appropriate sensitive marine organisms as defined in § 227.27(c) using procedures for suspended particulate phase bioassays approved by EPA, or, for dredged material, approved by EPA and the Corps of Engineers. Procedures approved for bioassays under this section will require exposure of organisms for a sufficient period of time and under appropriate conditions to provide reasonable assurance, based on consideration of the statistical significance of effects at the 95 percent confidence level, that, when the materials are dumped, no significant undesirable effects will occur due either to chronic toxicity or to bioaccumulation of the constituents listed in paragraph (a) of this section; and

(3) Bioassay results on the solid phase of the wastes do not indicate occurrence of significant mortality or significant adverse sublethal effects due to the dumping of wastes containing the constituents listed in paragraph (a) of this section. These bioassays shall be conducted with appropriate sensitive benthic marine organisms using benthic bioassay procedures approved by EPA, or, for dredged material, approved by EPA and the Corps of Engineers. Procedures approved for bioassays under this section will require exposure of organisms for a sufficient period of time to provide reasonable assurance, based on considerations of statistical significance of effects at the 95 percent confidence level, that, when the materials are dumped, no significant undesirable effects will occur due either to chronic toxicity or to bioaccumulation of the constituents listed in paragraph (a) of this section; and

(4) For persistent organohalogens not included in the applicable marine water quality criteria, bioassay results on the liquid phase of the waste show that such compounds are not present in concentrations large enough to cause significant undesirable effects due either to chronic toxicity or to bioaccumulation in marine organisms after allowance for initial mixing.

> (d) When the Administrator, Regional Administrator or District Engineer, as the case may be, has reasonable cause to believe that a material proposed for ocean dumping contains compounds identified as carcinogens, mutagens, or teratogens for which criteria have not been included in the applicable marine water quality criteria, he may require special studies to be done prior to issuance of a permit to determine the impact of disposal on human health and/or marine ecosystems. Such studies must provide information comparable to that required under paragraph (c)(3) of this section.

"Procedures for dredged material" acceptable to EPA and the Corps of Engineers, referred to in the quoted paragraphs of § 227.6, are in the EPA-Corps Implementation-Manual or "Green Book," which is mandatory (40 CFR § 227.6(e)).

In addition, 40 CFR § 227.13 entitled "Dredged materials" provides in pertinent part:

> (c) When dredged material proposed for ocean dumping does not meet the criteria of paragraph (b) of this section [which sets forth conditions under which dredged material is acceptable for ocean disposal without further testing], further testing of the liquid, suspended particulate, and solid phases, as defined in § 227.32, is required. Based on the results of such testing, dredged material can be considered to be environmentally acceptable for ocean dumping only under the following conditions:
>
> (1) The material is in compliance with the requirements of § 227.6; and
>
> (2)(i) All major constituents of the liquid phase are in compliance with the applicable marine water quality criteria after allowance for initial mixing; or
>
> (ii) When the liquid phase contains major constituents not included in the applicable marine water quality criteria, or there is reason to suspect synergistic effects of certain contaminants, bioassays on the liquid phase of the dredged material show that it can be discharged so as not to exceed the limiting permissible concentration as defined in paragraph (a) of § 227.27; and

(3) Bioassays on the suspended particulate and solid phases show that it can be discharged so as not to exceed the limiting permissible concentration as defined in paragraph (b) of § 227.27.

(d) For the purposes of paragraph (c)(2) of this section, major constituents to be analyzed in the liquid phase are those deemed critical by the District Engineer, after evaluating and considering any comments received from the Regional Administrator, and considering known sources of discharges in the area.

The Regional Administrator initially determined that approximately 100,000 cubic yards of material from the Oakland Inner Harbor in areas adjacent to Todd Shipyard and Schnitzer Steel would not meet the criteria for evaluating environmental impacts defined in 40 CFR § 227.4 (finding 5). The basis for this determination was that "(c)hemical tests of the turning basin material above the clay layer showed significant concentrations of heavy metals and organic pollutants. Bioassay and bioaccumulation tests of the same material showed significant differences when compared to Point Reyes reference sediments." Although the Regional Administrator revised his determination, in that materials below the clay layer at the Todd Shipyard stations were determined to be suitable for ocean disposal, he reaffirmed his determination that all materials in the vicinity of SN-2 were unsuitable, notwithstanding the TRP recommendation to the contrary, in the following language: "(s)tation SN-2 had the highest concentrations for the greatest number of chemicals as compared to all other stations, including station SN-3. Many of the chemicals found at SN-2 have a strong potential for bioaccumulation in marine organisms. Without consideration of the limiting permissible

concentration, the suspended particulate phase tests indicated that sediments in the vicinity of station SN-2 are acutely toxic. In addition, analysis of the scientific literature and numerous sediment chemistry and sediment bioassay test results indicated that sediments found in the vicinity of station SN-2 are potentially more toxic than those found at station SN-3" (finding 23).

The regulation, 40 CFR §§ 227.6(b), (c) and (d), makes it clear that the presence of prohibited constituents, in other than trace amounts, is to be determined by bioaccumulation and bioassay tests and that mere chemical concentrations or numbers of chemicals are not a basis for determining materials to be unsuitable for ocean disposal.[105/] See also the "Green Book," Subpart B, ¶ 14 providing in part "(t)he evaluative procedures emphasizes biological effects, rather than the simple presence of, possible chemical contaminants." Accordingly, the validity of the Regional Administrator's determination turns on the assertion that bioassay and bioaccumulation tests showed significant differences when compared to Point Reyes reference sediments. The "Green Book," Subpart B, ¶ 18, makes it clear that mortality is the end point for bioassays and, as we have seen (finding 14), it was not possible to calculate an LC_{50} for any organisms used in SPP tests for the simple reason mortality was not 50 percent or greater at the highest test

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[105/] See the preamble to the regulation, 42 Fed. Reg. 4166-67 (January 11, 1977), pertinent portions of which appear on Attachment A.

medium concentration. This, of course, is before initial mixing and LPC considerations mandated by 40 CFR §§ 227.6(c)(1), 227.13(c)(3) and the "Green Book." See 40 CFR § 227.27, which defines an LPC.

The only statistically significant mortality observed in SP tests was in Rhepox tests in sediments at Stations 3-1, 3-2, SN-3L and TD-2L (finding 14). Stations 3-1 and 3-2 are in the Channel and Complainant has not contended that materials in the Channel fail to meet the criteria for ocean disposal. The evidence is that Rhepox normally inhabits sandy sediments and poorly tolerates silty sediments (finding 14). The evidence also establishes that Rhepox survival decreases as the percent of fines increases (supra note 99) and that an increase in Rhepox survivorship of one percent would have rendered the purported statistically significant increase in mortality at TD-2L statistically non-significant (finding 73). That Rhepox, in the referenced test involving sediments at TD-2L, was responding, at least in part, to grain size effects would seem to be established beyond peradventure by the tests utilizing Sequim Bay sediments which are uncontaminated. Expert testimony, which has been accepted (supra note 101), is that it would be unreasonable to disregard the Sequim Bay test results. The ocean dumping regulations are concerned with toxicity, not grain size, and it is concluded that no statistically significant Rhepox mortality as contemplated by the regulations has been shown. Accordingly, to the extent the Regional Administrator's

unsuitability determination rests on statistically significant Rhepox mortality, it is not sustainable on this record.

The Regional Administrator's unsuitability determination for the TD sediments then hinges on statistically significant bioaccumulation of lead and TBT in tissues of the clam Macoma nasuta (finding 59). The record reflects that the TRP and Drs. Wright, Pequegnat and Patrick considered lead not to be of concern, because lead is ubiquitous and the levels shown are relatively low (findings 59 and 66). Moreover, lead is not a substance prohibited from ocean disposal in other than trace amounts in accordance with 40 CFR § 227.6 and there are no FDA action limits for lead.[106/] Lead levels for ocean disposal recommended by the LDC are 500 mg/kg (supra at note 23). It should also be noted that lead bioaccumulated to .88 ppm in clams exposed to CH-1 sediments and even Dr. Melzian does not contend that these sediments are unsuitable for ocean disposal.

As to TBT, the evidence is that high levels of organotins in sediments do not, a priori, indicate a significant adverse impact on the marine environment (finding 62). Moreover, the degradation of TBT is quite rapid and there is no correlation between TBT concentration and mortality shown in the Battelle Report (findings 63 and 67). Organotin concentrations reported in the Salazar

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[106/] This may be about to change as the FDA recently set an interim limit of 300 ppb for lead in domestic and imported table wines (Wall Street Journal, September 10, 1991). This level is approximately one-third the .92 ppm average shown in clam tissues after exposure to sediments from Station TD-2L (note 88, supra).

study, which are over 100 times those reported at the TD stations by Battelle, did not result in significant mortality and it was concluded the material qualified for ocean disposal under existing EPA/Corps regulations (finding 67). Moreover, the TBT concentrations reported by Battelle are among the lowest ever reported in organisms (finding 67) and, although TBT bioaccumulates, it does not biomagnify (finding 69).

In view of the foregoing, it is concluded that, notwithstanding the Regional Administrator's determination to the contrary, sediments from the Oakland Inner Harbor were in fact suitable for ocean disposal under the regulations properly construed. The TRP did not conclude to the contrary, acknowledging that additional solid phase bioassay and bioaccumulation test results from samples taken near the Schnitzer Steel Plant and Todd Shipyard were not by themselves clearly indicative of highly contaminated sediments that should be prohibited from ocean disposal.[107/] The District Engineer concurred in the TRP recommendations.[108/]

[107/] Finding 18. One need not close his eyes to the tendency of employees of one agency to "side with their own" in a dispute with another agency.

[108/] Under the statutory and regulatory scheme prevailing here, he had little alternative, if the dredging project were to proceed. The District Engineer strongly disagreed with the determination, contrary to the TRP recommendation, that sediments from SN-2 were unsuitable for ocean disposal, and the Regional Administrator's determination in this respect, being based on Dr. Melzian's recommendation, which in turn is based on Melzian's chemical ranking system, AET values and toxicity data without consideration of initial mixing (finding 58), disregards the regulations and is (continued...)

Dr. Melzian attempted to justify some of his conclusions by citing 40 CFR § 227.18, which is in Subpart D entitled "Impact of the Proposed Dumping on Esthetic, Recreational and Economic Values."[109] Complainant has made the same argument (Post-Hearing

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[108](...continued)
simply arbitrary.

[109] Vol. 8-117. Section 227.18, "Factors considered," provides:

> The assessment of the potential for impacts on esthetic, recreational and economic values will be based on an evaluation of the appropriate characteristics of the material to be dumped, allowing for conservative rates of dilution, dispersion, and biochemical degradation during movement of the material from a disposal site to an area of significant recreational or commercial value. The following specific factors will be considered in making such an assessment:
>
> (a) Nature and extent of present and potential recreational and commercial use of areas which might be affected by the proposed dumping;
>
> (b) Existing water quality, and nature and extent of disposal activities, in the areas which might be affected by the proposed dumping;
>
> (c) Applicable water quality standards;
>
> (d) Visible characteristics of the materials (e.g., color, suspended particulates) which result in an unacceptable esthetic nuisance in recreational areas;
>
> (e) Presence in the material of pathogenic organisms which may cause a public health hazard either directly or through contamination of fisheries or shellfisheries;
>
> (f) Presence in the material of toxic chemical constituents released in volumes which may affect humans directly;
>
> (g) Presence in the material of chemical constituents which may be bioaccumulated or persistent
>
> (continued...)

Brief at 147). This argument ignores the requirement for consideration of initial mixing and of the LPC and will not withstand analysis. Subpart D applies to materials in addition to dredged materials. Sections 227.6(c)(1) and 227.13(c)(3), setting forth the requirement for consideration of the LPC, are in Subpart B, "Environmental Impact." Complainant emphasizes paras. (f) and (g) of § 227.18, Subpart D, which refer to (f) "(p)resence in the material of toxic chemical constituents released in volumes which may affect humans directly" and (g) "(p)resence in the material of chemical constituents which may be bioaccumulated or persist and may have an adverse effect on humans directly or through food chain interactions." The quoted paragraphs may not be read in isolation, however, and must be considered in the light of the opening sentence of § 227.18 providing for "evaluation of the appropriate characteristics of the material to be dumped, allowing for conservative rates of dilution, dispersion, and biochemical degradation during movement of the materials from a disposal site to an area of significant recreational or commercial value." This appears to simply be another way of requiring consideration of initial mixing and the LPC and there is simply no evidence that any significant or measurable quantity of the materials here considered

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[109/](...continued)
and may have an adverse effect on humans directly or through food chain interactions;

(h) Presence in the material of any constituents which might significantly affect living marine resources of recreational or commercial value.

will move from the disposal site.[110/] The LPC requires consideration of bioassays and bioaccumulation data in accordance with § 227.27(b), which, of course, was the purpose of the Battelle Report. In summation, there is simply no evidence of any impacts on esthetic, recreational and economic values from materials moving off of the disposal site and these arguments must be recognized for what they are, i.e., "makeweights" designed to support a decision which could appropriately have been in favor of ocean disposal of the material.[111/]

[110/] See notes 77 and 78, supra. Section 227.29(a) defines "initial mixing" as "(t)hat dispersion or diffusion of liquid, suspended particulate, and solid phases of a waste which occurs within four hours after dumping." The cited section goes on to provide that "(t)he limiting permissible concentration shall not be exceeded beyond the boundaries of the disposal site during initial mixing, and shall not be exceeded at any point in the marine environment after initial mixing." A method of estimating the maximum concentration for the solid phase of a dumped material after initial mixing, when no other means of estimation are feasible, is set forth in § 227.29(b)(2) "(t)he solid phase of a dumped waste may be assumed to settle rapidly to the ocean bottom and to be distributed evenly over the ocean bottom in an area equal to that of the release zone as defined in § 227.28." Section 227.28 defines the "release zone" as "the area swept out by the locus of points constantly 100 meters from the perimeter of the conveyance engaged in dumping activities, beginning at the first moment in which dumping is scheduled to occur and ending at the last moment in which dumping is scheduled to occur." Any determination of the "release zone" obviously includes the length and width of the disposal vessel and this provision should be compared with the permit provision as to the permissible dumping area (findings 46 and 47).

[111/] Because the impacts of the dumping on fisheries and other marine resources are appropriately considered in the site selection process (40 CFR Part 228), it is logical to limit consideration of these impacts to those resulting from material moving off the disposal site.

Paragraph 37 of the "Green Book" under the "Need for Ocean Dumping," 40 CFR Part 227, Subpart C, provides that this subpart is in effect an evaluation of alternative disposal sites in terms of potential environmental impacts, irreversible commitment of resources, and costs. It also makes it clear that confined or upland disposal cannot be considered environmentally preferable to ocean disposal, unless consideration of potential environmental impacts show it to be so. See also 40 CFR § 227.17(b)(2), which is in Subpart D, providing that the consequences of not authorizing the dumping must be considered, including, without limitation, the impact on esthetic, recreational and economic values with respect to the municipalities and industries involved. If Complainant is to rely on Subparts C, D, and E as justification for the unsuitable determination, it must follow these subparts in their entirety and may not pick selected passages out of context. There is no evidence here of even cursory consideration of the mentioned requirements.

Dr. Melzian also cited 40 CFR § 227.20, which is in Subpart E, "Impact of the Proposed Dumping on Other Uses of the Ocean," as justification for his claim that he could use "state-of-the-art" data in evaluating Oakland Inner Harbor sediments and, in effect, disregard the "Green Book" as obsolete. Section 227.21, "Uses considered," provides for the consideration of, inter alia, commercial and recreational fishing in open ocean areas. The opening sentence of § 227.20(a) "Basis for determination," cited by Dr. Melzian, provides "(a) (b)ased on current state of the art,

consideration must be given to any possible long-range effects of even the most innocuous substances when dumped in the ocean on a continuing basis."

It is not clear that the Oakland Inner Harbor dredging project, even if completed to the minus 42 ft. MLLW contemplated, would have involved dumping in the ocean on a continuing basis within the meaning of the quoted sentence. A fortiori, is this true, as to the much smaller, Phase I of the project at issue here. More fundamentally, however, Dr. Melzian once again reads selected portions of the regulation in isolation. Section 227.4, supra at 119-20, is entitled "Criteria for evaluating environmental impact" and provides that, if the applicable prohibitions, limits, and conditions [of Subpart B] are satisfied, it is the determination of EPA that the proposed disposal will not unduly degrade or endanger the marine environment and that the disposal will present no unacceptable adverse effects for the reasons listed.

It has been concluded above that the Battelle Report and the record compiled here provide ample basis for the conclusion that the prohibitions, limits and conditions of Subpart B have been satisfied. Accordingly, the findings in § 227.4(a) through (d), specifically determining there would be no unacceptable adverse effects for the listed reasons, require circumstances, not present here, for the materials to be properly determined unacceptable for ocean disposal under Subparts C, D and E of Part 227.

As we have seen (finding 5) the Regional Administrator's initial unsuitable determination was based on the alleged failure

to meet the criteria for acceptable environmental impacts set forth in § 227.4. Although Complainant refers to Subpart D, "Impact of the proposed Dumping on Esthetic, Recreational and Economic Values," and to Subpart E, "Impact of the Proposed Dumping on Other Uses of the Ocean," and to factors the Regional Administrator is required to consider thereunder, it emphasizes that the regulations set forth a single ultimate standard barring unreasonable degradation or endangerment of human health or the environment (Post-Hearing Brief at 147). This merely confirms the point made above, i.e., if the materials comply with the limitations of Subpart B, it would be a rare circumstance where the materials could reasonably be determined to present unreasonable risks to human health or the environment under Subparts C, D or E. In any event, the evidence here does not support such a determination and the conclusion previously stated that the material was acceptable for ocean disposal under the regulations properly construed is affirmed.

C. Dumping Outside Permit Limits

Complainant's view that the permit provision setting forth the limits within which materials were to be dumped at the disposal site (supra note 71) means that the dumping must be completed while the scow travels a maximum distance of 90 meters has been rejected (finding 47). Instead, Mr. Mankowski's interpretation that the provision necessarily incorporates the length of the scow has been accepted, i.e., that disposal could commence once the bow of the disposal vessel reached a point which is 30 meters from a line

perpendicular to the path of travel which also passes through the site center and disposal could continue until the scow has passed 60 meters beyond the mentioned line. Because the length of the scow will obviously affect actual placement of the material, this interpretation more nearly accords with reality. Additionally, the definition of a release zone in 40 CFR § 227.28 (supra note 110) incorporates the length and width of the scow.

According to Complainant, only Load No. 5 was dumped within the limits specified by the permit. Evidence which has been accepted shows, however, that Load No. 3 was dumped from 30 ft. to 50 ft. from the site center and thus well within permit limits (finding 49). Additionally, Load No. 6 was dumped 80 meters from the site center and could have been in compliance with the permit properly interpreted (supra note 76). This leaves Load Nos. 1 and 2 and a portion of Load No. 4, only about one-third of which was dumped, as clearly outside permit limits. Great Lakes was authorized to dump Load No. 1 using Loran-C, if the EPS was not functioning (finding 50). Loran-C has a minimum accuracy of one-quarter of a nautical mile (supra note 47).

The record reflects that electronic positioning system (EPS) used by Great Lakes was state-of-the-art and that there was no system short of putting an EPS on the scow and manning it, which would give better accuracy than Great Lakes was able to achieve with its system (finding 50). The permit required an EPS on the tug and achieving an accuracy or repeatability of plus or minus three meters on the tug did not mean that the same accuracy would

be achieved on the scow (Id.). It should also be noted that achieving the navigational accuracy specified by the permit was experimental and had never been tried before (findings 47 and 51).

The Port and the Corps recognized that a learning curve or "shakedown" period would be necessary in order for the precision dumping contemplated by the permit to be consistently achieved (finding 51). Mr. Mankowski, who was aboard the tug during the transport of Loads 1 and 2 to the disposal site, was surprised that the loads were not dumped more closely to the site center (finding 50). The record clearly shows that not only was Great Lakes making good faith efforts to comply with the permit, but that its navigational accuracy was improving, three of the last four loads being either within permit limits or nearly so. Under these circumstances, Complainant's failure to give any consideration to the statutory factor of "demonstrated good faith of the person charged in attempting to achieve rapid compliance after notification [knowledge] of the violation" (MPRSA § 105) cannot be justified. Under all of the circumstances, it is concluded that Great Lakes' failure to dump all loads within the limits set by the permit warrants neither a penalty for a violation as a separate count, nor an augmentation of the penalty for unpermitted dredging.

D. Penalty

The record reflects that through an inadvertent transposition of data entered into a computer, Great Lakes made a navigational error and dredged into the A-2 area within the Turning Circle and also outside the Turning Circle where dredging was not authorized

by the permit. The unpermitted dredging occurred during the period 7:00 a.m. on Saturday, May 15, 1988, to shortly after 5 o'clock p.m. on Sunday, May 16, 1988 (finding 31). These materials, totaling 7,885 cubic yards (finding 33), were disposed of in the ocean. Although Complainant contends that Great Lakes should have been aware of the error at an earlier time, because, inter alia, "hard digging" was encountered, the record shows that "hard digging" was to be expected, because the San Francisco Bay area is underlain by a layer of hard material, known as "Merritt Sands," and because refusal was encountered in taking, or attempting to take, core samples in the area (Id.). Moreover, although Mr. Beery, who called Great Lakes' attention to the error by claiming Great Lakes was dredging on his properly, maintained that it should have been obvious that the dredge was too close to the shoreline, he acknowledged that a portion of the pier was missing, which could explain why the dredge was closer to the shoreline than Great Lakes' personnel thought (finding 29). Under these circumstances, there is no basis for Complainant's charge that Great Lakes was grossly negligent.

Because the navigational error was confirmed by Great Lakes at approximately 8:10 p.m. on May 15, 1988, and Load No. 6 was not dumped in the ocean until about 10:13 p.m. on that date, Complainant considers it especially egregious that Great Lakes made no attempt to halt the dumping by calling the tug (finding 43). The Corps-EPA Joint Panel, which investigated the unpermitted dredging, determined, however, that the exact location where the

contents of Load No. 6 had been dredged was not known until the next day (supra note 79). Testimony at the hearing confirmed this determination. Accordingly, this alleged failure does not establish a flagrant violation of the permit and Act as contended by Complainant.

The foregoing establishes that the gravity of the misconduct by Great Lakes which resulted in the unpermitted dredging and disposal was slight rather than serious or grave. The other aspect of "gravity of the violation" is the harm or potential harm resulting from the violation. It has been concluded in Part B above that the materials under consideration here could appropriately have been determined to be suitable for ocean disposal under the regulations properly construed and applied. This without more indicates that the harm or potential harm resulting from the unpermitted dredging and disposal is also slight. Moreover, materials from below the clay layer were considered to be unaffected by human activity and thus uncontaminated and suitable for ocean disposal. Only 860 cubic yards of the material dredged from the A-2 area were from above the clay layer (finding 34). This amount is approximately 11 percent of the unpermitted dredging and approximately 4.3 percent of the approximate 20,000 plus total cubic yards dredged by Great Lakes. Although these amounts appear too large to be properly considered de minimis, they nevertheless establish that it would be unreasonable to expect any permanent, lasting or measurable affects from the unpermitted dredging and disposal (supra note 77).

As indicated (finding 40), the Regional Administrator gave loss of confidence in the government as a reason for his view that the unpermitted dredging and dumping here shown were grave violations of the Act. Damage to a government program is a recognized element of the gravity or seriousness of a violation. This, however, can be a two-edged sword as it is axiomatic that an agency is bound by its own regulations and the record here much shows that the Region failed to adhere to that well established principle. Although no dredging occurred in the SN-2 area findings herein establish that the Regional Administrator's determination these materials were unacceptable for ocean disposal disregarded the regulations and was simply arbitrary.

Dr. Melzian, whose recommendations were readily accepted by the Regional Administrator, construes the regulations as conferring broad discretion on the Regional Administrator in making determinations as to the acceptability of materials for ocean disposal (finding 57). Dr. Melzian reaches this conclusion by reading selected terms or phrases of subparts of Part 227, other than Subpart B "Environmental Impact," out of context, e.g., "current state-of-the-art," which appears in 40 CFR § 227.20, which, in turn, is in Subpart E, "Impact of the Proposed Dumping on Other Uses of the Ocean." Under this view, major emphasis may e placed on sediment chemistry and AET's and the "Green Book" may in effect be disregarded as obsolete (supra note 85). This overlooks or ignores the clear requirement of § 227.6 and the "Green Book" that suitability for ocean disposal of dredged material is to be

based on bioassay and bioaccumulation tests and the findings in § 227.4 that, if the prohibitions, limitations and conditions of Subpart B are satisfied, there will be no unacceptable environmental impacts on the ocean. Accordingly, something more than vague concerns about possible long-range impacts on the ocean based on alleged current "state-of-the-art" knowledge must be shown in order to override the findings of § 227.4. On this record, that something more hasn't been shown and it has been concluded that all of the materials at issue could appropriately have been determined to be suitable for ocean disposal. The point here, of course, is that it behooves an agency which insists on scrupulous compliance with regulations and permit conditions to exhibit the same scrupulousness as to compliance with its own regulations.

There is no penalty policy particularly applicable to MPRSA and Complainant has relied on a "Policy on Civil Penalties" and "A Framework for Statute-Specific Approaches to Penalty Assessments" (C's Exhs 76 & 77) for general guidance. These documents make it clear that deterrence is the primary goal of penalties and that, as a minimum, penalties should remove any significant economic benefit from noncompliance. These policies also make it clear that an additional amount above the economic benefit from noncompliance is to reflect the seriousness or gravity of the violation and the degree of wilfulness and/or negligence. The degree of wilfulness and/or negligence is simply another way of stating gravity of the misconduct. It is not contended, nor could it be, that Great Lakes enjoyed any economic benefit from the unpermitted dredging and

dumping shown here. Because the dredged materials at issue could appropriately have been determined to be acceptable for ocean disposal under the regulations properly construed and applied and because the unpermitted dredging and dumping resulted from a navigational error occasioned by the inadvertent transposition of data entered into a computer, the gravity of the harm and the gravity of the misconduct are both slight.

Under the circumstances, it is concluded that a penalty of $10,000 will adequately deter Great Lakes and others from future violations of the kind shown here.

In accordance with section 105 of the Act, a penalty of $10,000 will be assessed against Great Lakes for unpermitted dredging and resulting ocean disposal.

O R D E R

Complainant's motion for leave to file a second amended complaint is denied.

Great Lakes Dredge and Dock Company having violated the Act and Permit No. 17317E35, a penalty of $10,000 is assessed against it in accordance with section 105 of the Marine Protection, Research and Sanctuaries Act (33 U.S.C. § 1415). Payment of the penalty shall be made by sending a cashier's or certified check in

the amount of $10,000 payable to the Treasurer of the United States to the following address within 60 days of the receipt of this order:[112/]

Regional Hearing Clerk
U.S. EPA, Region IX
P.O. Box 360863M
Pittsburgh, PA 15251

Dated this 24th day of October 1991.

Spencer T. Nissen
Administrative Law Judge

ATTACHMENT A

[112/] Unless appealed in accordance with Rule 22.30 (40 CFR Part 22) or unless the Administrator elects sua sponte to review the same as therein provided, this initial decision will become the final order of the Administrator in accordance with Rule 22.27(c).

ATTACHMENT A

Pertinent portions of the preamble to the regulation, 42 Fed. Reg. 4166-67 (January 11, 1977):

> Sections of Part 227 have been revised to reflect the recommendations of the workshop; thus, all criteria are based on ecosystem impact rather than on assumptions regarding allowable deviations from normal ambient values. These revisions are consistent with the concept of "unreasonable degradation" in these regulations and are directed toward achieving the goal of preventing significant impact on the biota. The use of bioassay results for regulatory purposes will provide EPA with direct measurements of the impact of dumping materials, so that it will no longer be necessary to infer damage indirectly through measurements related to normal ambient values.
>
> Substantial revisions have been made in §§ 227.6, 227.13, and Subpart G. Details of the specific changes are presented below in the discussion of those sections. In general, § 227.6 has been revised to use liquid, suspended particulate, and solid phase bioassays as the basis for determining trace contaminants; § 227.13 has been changed to require bioassay results to be used in determining whether or not dredged material is environmentally acceptable for ocean dumping; and Subpart G has been revised to include definitions of liquid, suspended particulate, and solid phases, and of initial mixing allowances and limiting permissible concentrations for both liquid and solid phases.
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> * * * *
>
> For suspended particulate and solid phases, however, the state-of-the-art has not yet advanced to the point where sediment quality criteria can be set. In fact, research on benthic bioassays is only now at the stage where interim procedures can be developed and used. Nevertheless, there was general agreement among the participants at the technical workshop that even the interim procedures now available provide much better information on the impact of solid phases of waste materials on the marine ecosystem than does any form of bulk analysis. * * * *
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> * * * *

Section 227.13--Dredged materials. This section has been completely redrafted in response to comments pointing out that the dredged material criteria were not comparable to those for other materials. As redrafted, dredged material, as well as all other wastes containing liquid, suspended particulate and solid phases, must meet the requirements of §§ 227.5, 227.6, 227.9, 227.10, 227.13, and Subpart G, in order to be environmentally acceptable for ocean disposal.

* * * *

Section 227.27--Limiting Permissible Concentration (LPC). This section has been redrafted to define LPC for the liquid, suspended particulate, and solid phases. The liquid phase LPC has been associated, wherever possible, with the applicable marine water quality criteria, and the suspended particulate and solid phases have been based on the avoidance of overall chronic toxicity after allowance for initial dispersion. * * * *

* * * * The combination of bioassay procedures specified in the criteria provide information on adverse impact directly for the entire waste. Thus, the presence or absence of any specific constituent, other than those listed in Section 227.6, is not a significant factor as long as the overall impact of the waste is known.

* * * *.