

**APPENDIX D**  
**RESPONSE TO COMMENTS REPORT**

**Tentative Cleanup and Abatement Order No. R9-2011-0001 and Draft  
Technical Report for the Shipyard Sediment Site, San Diego Bay**

**August 23, 2011**

**California Regional Water Quality Control Board  
San Diego Region**

**Response to Comments Report**



**Tentative Cleanup and Abatement Order No. R9-2011-0001  
and Draft Technical Report for the  
Shipyard Sediment Site  
San Diego Bay**

**August 23, 2011**

# STATE OF CALIFORNIA

EDMUND G. BROWN, JR. Governor  
MATT RODRIQUEZ, Agency Secretary, California Environmental Protection Agency



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## **LIST OF ORGANIZATIONS THAT SUBMITTED COMMENTS**

BAE Systems San Diego Ship Repair  
Campbell Industries  
City of San Diego  
National Steel and Shipbuilding Company  
San Diego Coastkeeper and Environmental Health Coalition  
San Diego Gas and Electric  
San Diego Unified Port District  
Star and Crescent Boat Company  
United States Navy



## **LIST OF DESIGNATED PARTIES**

1. BAE Systems San Diego Ship Repair, Inc. (formerly Southwest Marine, Inc.)
2. National Steel and Shipbuilding Company (NASSCO)
3. San Diego Gas & Electric Company, a subsidiary of Sempra Energy Company
4. Chevron USA, a subsidiary of Chevron Texaco
5. BP, the parent company of and successor to Atlantic Richfield Co. (ARCO)
6. U.S. Department of the Navy
7. City of San Diego
8. Marine Construction and Design Company / Campbell Industries, Inc.
9. San Diego Unified Port District
10. San Diego Coastkeeper (formerly San Diego Baykeeper)
11. Environmental Health Coalition
12. San Diego Port Tenants Association
13. San Diego Water Board Cleanup Team

## LIST OF ACRONYMS, ABBREVIATIONS, AND KEY TERMS

<b>AET</b>	Apparent Effects Threshold	<b>COCs</b>	Constituents of Concern
<b>AFFF</b>	Aqueous Film Forming Foam	<b>COMM</b>	Commercial and sport fishing
<b>ASTM</b>	American Society of Testing Material	<b>CoPC</b>	Chemicals of Potential Concern
<b>ANOVA</b>	Analysis of Variance	<b>CSF</b>	Cancer Slope Factor
<b>AQUA</b>	Aquaculture Beneficial Use	<b>CTR</b>	California Toxics Rule
<b>ARCO</b>	Atlantic Richfield Company	<b>Cu</b>	Copper
<b>ASTs</b>	Aboveground Storage Tanks	<b>CWA</b>	Clean Water Act
<b>AT &amp; SF</b>	Atchison, Topeka, and Santa Fe Railroad	<b>CWC</b>	California Water Code
<b>AUF</b>	Area Use Factor	<b>DDT</b>	Dichlorodiphenyltrichloroethane
<b>AVS/SEM</b>	Acid Volatile Sulfide / Simultaneously Extracted Metals	<b>DFG</b>	California Department of Fish and Game
<b>BAE Systems</b>	BAE Systems San Diego Ship Repair	<b>DRO</b>	Diesel Range Organics
<b>BAF</b>	Biota Accumulation Factor	<b>DTR</b>	Draft Technical Report
<b>BAP</b>	Benzo[a]pyrene	<b>DTSC</b>	California Department of Toxic Substances Control
<b>BAZ</b>	Biologically Active Zone	<b>DWQ</b>	Division of Water Quality
<b>Basin Plan</b>	Water Quality Control Plan for the San Diego Basin – Region 9	<b>EHC</b>	Environmental Health Coalition
<b>BIOL</b>	Preservation of biological habitats of special significance	<b>EMC</b>	Event mean concentration
<b>Bight 08</b>	Southern California Bight 1998 Regional Marine Monitoring Survey	<b>ERA</b>	Ecological Risk Assessment
<b>BMP</b>	Best Management Practice	<b>ERL</b>	Effects range low
<b>BPJ</b>	Best Professional Judgment	<b>ERM</b>	Effects range medium
<b>BRI-E</b>	Benthic Response Index for Embayments	<b>EST</b>	Estuarine habitat
<b>BSAFs</b>	Biota-to-Sediment Accumulation Factors	<b>HPAHs</b>	High Molecular Weight Polynuclear Aromatic Hydrocarbons
<b>BTAG</b>	U.S. Navy/USEPA Region 9 Biological Technical Assistance Group	<b>IND</b>	Industrial service supply
<b>CAD</b>	Confined Aquatic Disposal	<b>Invest Co.</b>	Star & Crest Investment Company
<b>CalEPA</b>	California Environmental Protection Agency	<b>IR</b>	Ingestion Rate
<b>CAO</b>	Cleanup and Abatement Order	<b>IRIS</b>	Integrated Risk Information System
<b>CCC</b>	Criterion Continuous Concentration	<b>Kp</b>	Partition Coefficients
<b>CCR</b>	California Code of Regulations	<b>LAET</b>	Lowest Apparent Effects Threshold
<b>CDF</b>	Confined Disposal Facility	<b>IRP</b>	Installation Restoration Program
<b>CEQA</b>	California Environmental Quality Act	<b>LC50</b>	Median Lethal Concentration
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation, and Liability Act	<b>LOAELs</b>	Low-Adverse-Effects-Levels
<b>CFR</b>	Code of Federal Regulations	<b>LOE</b>	Lines of Evidence
<b>City</b>	City of San Diego	<b>LPAHs</b>	Low Molecular Weight Polynuclear Aromatic Hydrocarbons
<b>CMC</b>	Criterion Maximum Concentration	<b>LPL</b>	Lower Prediction Limit
<b>CNRSW</b>	Commander Navy Region Southwest	<b>MAR</b>	Marine habitat
<b>Coastkeeper</b>	San Diego Coastkeeper	<b>MARCO</b>	Marine Construction and Design Company
		<b>MEC</b>	Midpoint Effect Concentration
		<b>MEK</b>	Methyl Ethyl Ketone
		<b>MIGR</b>	Migration of aquatic organisms
		<b>MLLW</b>	Mean lower low water
		<b>MLOE</b>	Multiple Lines of Evidence
		<b>MM</b>	Management measures
		<b>MNA</b>	Monitored Natural Attenuation
		<b>MOS</b>	Margin of safety
		<b>MS4</b>	Municipal Separate Storm Sewer Systems

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<b>MSL</b>	Mean Sea Level	<b>SEM</b>	Simultaneously Extracted Metals
<b>MTDB</b>	Metropolitan Transit Board	<b>SHELL</b>	Shellfish harvesting
<b>NA</b>	NASSCO	<b>SPI</b>	Sediment Profile Imaging
<b>NASSCO</b>	National Steel and Shipbuilding Company	<b>SQG</b>	Sediment Quality Guidelines
<b>NAV</b>	Navigation	<b>SEQG</b>	Sediment Quality Guideline Quotient
<b>NAVSTA</b>	Naval Station	<b>SS-MEQ</b>	Site-Specific Median Effects Quotient
<b>NOAA</b>	National Oceanic and Atmospheric Administration	<b>SQOs</b>	Sediment quality objectives
<b>NOAELs</b>	No-Adverse-Effects-Levels	<b>SS</b>	Site Specific
<b>NOV</b>	Notice of Violation	<b>SSO</b>	Site-specific objective
<b>NPDES</b>	National Pollutant Discharge and Elimination System	<b>Star &amp; Crescent State Board</b>	Star & Crescent Boat Company State Water Resources Control Board
<b>NRTAs</b>	Natural Resource Trustees Agencies	<b>SVOCs</b>	Semi Volatile Organic Compounds
<b>NRC</b>	National Research Council	<b>S-W Diversity</b>	Shannon-Weiner Diversity Index
<b>NTR</b>	National Toxics Rule	<b>SWAC</b>	Surface-Area Weighted Average Concentration
<b>NURP</b>	National Urban Runoff Program	<b>SWI</b>	Sediment Water Interface
<b>NWR</b>	Sweetwater Marsh and South San Diego Bay National Wildlife Refuges	<b>SWM</b>	Southwest Marine, Inc.
<b>OAL</b>	Office of Administrative Law	<b>SWCS</b>	Storm Water Conveyance System
<b>OHHEA</b>	Office of Environmental Health and Hazard Assessment	<b>SWPPP</b>	Storm Water Pollution Prevention Plan
<b>PAHs</b>	Polynuclear Aromatic Hydrocarbons	<b>SWPMP</b>	Storm Water Pollution Monitoring Plan
<b>PCBs</b>	Polychlorinated Biphenyl	<b>TCAO</b>	Tentative Cleanup and Abatement Order
<b>PCTs</b>	Polychlorinated Terphenyls	<b>TBT</b>	Tributyltin
<b>PEL</b>	Probable Effects Level	<b>TMDL</b>	Total Maximum Daily Load
<b>PL</b>	Prediction Limit	<b>TOC</b>	Total Organic Carbon
<b>Port</b>	San Diego Unified Port District	<b>TPH</b>	Total Petroleum Hydrocarbons
<b>Porter-Cologne</b>	Porter-Cologne Water Quality Control Act	<b>TR</b>	Tissue Residue (biota-water-sediment equilibrium partitioning approach)
<b>PPPAH</b>	Priority Pollutant Polynuclear Aromatic Hydrocarbon	<b>TRGs</b>	Tissue Residue Guidelines
<b>PRGs</b>	Preliminary Remediation Goals	<b>TRI</b>	Toxic Release Inventory
<b>PW</b>	Pore Water	<b>Triad</b>	Sediment Quality Triad
<b>QAPP</b>	Quality Assurance Project Plan	<b>TRV</b>	Toxicity Reference Value
<b>QA/QC</b>	Quality Assurance/ Quality Control	<b>TSCA</b>	Toxic Substances Control Act
<b>RAP</b>	Remedial Action Plan	<b>TSS</b>	Total Suspended Solids
<b>RARE</b>	Rare, threatened, or endangered species	<b>TUc</b>	Toxic Unit Chronic
<b>REC1</b>	Water contact recreation	<b>ug/kg</b>	microgram/kilogram
<b>REC2</b>	Non-contact water recreation	<b>UPL</b>	Upper Prediction Limit
<b>RfD</b>	Reference Dose	<b>USEPA</b>	United States Environmental Protection Agency
<b>RLs</b>	Response Levels	<b>USFWS</b>	United States Fish and Wildlife Service
<b>RME</b>	Reasonable Maximum Exposure	<b>USTs</b>	Underground storage Tanks
<b>RRO</b>	Residual Range Organics	<b>US Navy</b>	United States Navy
<b>SAR</b>	Shipyards Sediment Site Administrative Record	<b>VOCs</b>	Volatile Organic Compounds
<b>SCCWRP</b>	Southern California Coastal Water Research Project	<b>Water Boards</b>	State Water Resources Control Board and CA Regional Water Quality Control Boards
<b>SDG&amp;E</b>	San Diego Gas and Electric Company	<b>WDR</b>	Waste discharge requirements
<b>SDMCC</b>	San Diego Marine Construction Company	<b>WER</b>	Water effects ratio
<b>SDUPD</b>	San Diego Unified Port District	<b>WILD</b>	Wildlife habitat

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**WOE**            Weight of Evidence  
**WQC**            Water quality criteria

**WQO**            Water Quality Objectives

## EXECUTIVE SUMMARY

The California Regional Water Quality Control Board, San Diego Region's (San Diego Water Board) Cleanup Team prepared this Response to Comments Report on the Shipyard Sediment Site Tentative Cleanup and Abatement Order No. R9-2011-0001 (TCAO) and its supporting Draft Technical Report (DTR). The DTR presented a straightforward, yet sophisticated, analysis of the deleterious impacts to beneficial uses from elevated levels of metals, PCBs, and other pollutant wastes that have accumulated in San Diego Bay bottom sediments at the Site. Because the DTR concluded that beneficial uses in San Diego Bay are impaired by these elevated levels of pollutants, the Cleanup Team undertook a further analysis of an appropriate cleanup level under State Water Resource Control Board (State Water Board) Resolution No. 92-49. The TCAO ordered a group of responsible parties to cleanup the pollutant wastes they discharged at the Shipyard Sediment Site to specific numeric cleanup levels that will protect beneficial uses of San Diego Bay. To ensure that beneficial uses are protected and remain so, the TCAO further established a robust post-remedial monitoring regime. This Report addresses over 450 technical and legal comments submitted by 10 different organizations and entities, including environmental organizations and responsible parties named as "dischargers" under the TCAO.

The comments received not only discussed a wide variety of topics addressed in the DTR and TCAO, but also were demonstrably divergent in their treatment of those topics. All the commentors based their comments, in large part, on the same data, which was collected in 2001 and 2002, and reported in the Shipyard Report (Exponent, 2003). Yet the commentors' interpretations of that data were wildly different. For example, on the one hand, the National Steel and Shipbuilding Company Shipyard (NASSCO) and BAE Systems San Diego Ship Repair (BAE Systems) concluded the Exponent data demonstrated beneficial uses at the Shipyard Sediment Site are not impaired, that no active remediation at the Site is necessary, and that monitored natural attenuation should be the preferred remedy. On the other hand, the Environmental Health Coalition (EHC) and San Diego Coastkeeper concluded the Exponent data demonstrated beneficial uses are greatly impaired, particularly with respect to aquatic wildlife, and that active remediation in the form of dredging should be employed over a much larger portion of the Site than the TCAO recommends.

In this Report, the Cleanup Team employed a "user friendly" approach to organizing and responding to comments. All of the comments relating to a specific subject in the DTR and/or TCAO, as well as the Cleanup Team's respective responses, were grouped together and organized by finding number.<sup>1</sup> In the above example, all of the comments, rebuttal comments, and the Cleanup Team's responses to comments relating to alternative cleanup levels by NASSCO, BAE Systems, EHC and Coastkeeper (and indeed all of the commentors), can be found under Finding 32 .

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<sup>1</sup> All of the original comment and rebuttal comment letters are provided on the San Diego Water Board website here: [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/shipyards\\_sediment/2005\\_0126adt.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/shipyards_sediment/2005_0126adt.shtml) . The Comment ID numbers used in this Report refer to numbers the Cleanup Team assigned to each of the over 450 individual comments received. All the individual comments are provided in Appendix B, listed by their Comment ID number.

Several parties, including San Diego Gas and Electric (SDG&E), Star & Crescent Boat Company (Star & Crescent), the U.S. Navy, and the San Diego Unified Port District (Port District), contended that there is no substantial evidence in the record to support naming them as dischargers under the TCAO. Many of the other parties disagreed, and submitted rebuttal comments and evidence to support the TCAO's findings of responsibility. Consistent with the "user friendly" approach described above, the Cleanup Team organized the comments, rebuttal comments, and its responses regarding a specific party's responsibility for cleanup under the applicable finding number (Finding 9 for SDG&E), (Finding 5 for Star & Crescent), (Finding 10 for the Navy), (Finding 11 for the Port District).

In addition to this Report, based on the quality, content and character of the comments received, the Cleanup Team will clarify and add data, analyses and evidence to the DTR, and produce revisions to the DTR and TCAO on September 15, 2011, as required by the Third Amended Order of Proceedings. However, despite the number and diversity of comments, the Cleanup Team expects to recommend very few changes to the TCAO. On balance, the comments, rebuttal comments, and preparing responses to them, served to illustrate the soundness and reasonableness of the Cleanup Team's analysis in the DTR and recommendations in the TCAO.

"The most basic goal of the California Regional Water Quality Control Board, San Diego Region...is to preserve and enhance the quality of resources in the San Diego Region for the benefit of present and future generations." [Water Quality Control Plan for the San Diego Basin (Basin Plan), p.1] Since its earliest iteration, the Basin Plan has contained an entire section in its implementation chapter emphasizing the importance of appropriate regulation of the shipyards as a critical tool for implementing this most basic Basin Plan goal. As illustrated by this Report, the TCAO, and its supporting DTR, represent perhaps the most significant action taken to date by the San Diego Water Board to enhance and protect the beneficial uses of San Diego Bay that have long been impacted by activities at the Shipyard Sediment Site.

## 1. TCAO Finding 1 and DTR Section 1: Waste Discharge

Finding 1 of TCAO No. R9-2011-0001 states:

Elevated levels of pollutants above San Diego Bay background conditions exist in the San Diego Bay bottom marine sediment along the eastern shore of central San Diego Bay extending approximately from the Sampson Street Extension to the northwest and Chollas Creek to the southeast, and from the shoreline out to the San Diego Bay main shipping channel to the west. This area is hereinafter collectively referred to as the “Shipyard Sediment Site.” The National Steel and Shipbuilding Company Shipyard facility (NASSCO), the BAE Systems San Diego Ship Repair Facility (BAE Systems), the City of San Diego; Star & Crescent Boat Company, Campbell Industries (Campbell); San Diego Gas and Electric (SDG&E); the United States Navy, and the San Diego Unified Port District (Port District) have each caused or permitted the discharge of waste to the Shipyard Sediment Site resulting in the accumulation of waste in the marine sediment. The contaminated marine sediment has caused conditions of contamination or nuisance in San Diego Bay that adversely affect aquatic life, aquatic-dependent wildlife, human health, and San Diego Bay beneficial uses. A map of the Shipyard Sediment Area is provided in Attachment 1 to this Order.

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### RESPONSE 1.1

**DTR Sections:** 1, 36

**Comments Submitted By:** NASSCO, Coastkeeper and EHC, BAE Systems

**Comment IDs:** 33, 35, 39, 40, 41, 42, 54, 108, 133, 134, 291, 294, 16, 418, 419, 420, 438

#### **Comment**

Several Designated Parties made comments on the adequacy of the TCAO and DTR based on legal arguments concerning Water Code section 13304 and Resolution No. 92-49. Those comments are presented below.

ID 33

NASSCO commented that the TCAO treats NASSCO differently than other similar sites, in violation of law. The TCAO violates the consistency requirement that is expressly stated in Resolution No. 92-49, as well as related principles of due process and equal protection by proposing cleanup levels that are far more stringent than what has been required at other similarly situated shipyard and boatyard sites in San Diego Bay and elsewhere. Fundamental fairness dictates that similarly situated sites should be treated similarly, and there is no rational basis for treating NASSCO differently than other comparable sites in the same water body, especially in light of overall condition of the site, as documented in the sediment investigation and Exponent Report.

ID 155

Resolution 92-49 provides that the “Regional Water Board shall . . . prescribe cleanup levels which are consistent with appropriate levels set by the Regional Water Board for analogous discharges that involve similar wastes, site characteristics, and water quality considerations.” See also Barker Deposition, at 345:12-345:17 (recognizing that a goal of Resolution 92-49 is to ensure that Regional Boards treat similar sites similarly). Principles of due process and equal protection also require both fundamental fairness, and that persons subject to legislation or

regulation who are in the same circumstances be treated alike. U.S. Const. amend. XIV, §1; Cal. Const. art. I, §§ 7, 15.

Over the past decade, the Regional Board has prescribed cleanup levels for sediments at other shipyard and boatyard locations on San Diego Bay with analogous discharges involving similar circumstances as the Site. See e.g., San Diego Regional Board Order Nos. 88-86, 88-78, 89-31, 84-100, 94-101, 94-102, 95-21, 97-63, 99-06, 2001-303, R9-2002-0072. Barker Depo, Ex. 1210 at Exhibit A. However, despite substantial similarities between these sites and NASSCO, the Regional Board now seeks to impose radically more stringent cleanup levels upon NASSCO in departure from prior precedent and in violation of both due process and equal protection principles, and the consistency requirement expressly stated in Resolution 92-49.

The proposed cleanup levels are unprecedented compared to other sediment remediation projects in San Diego Bay. Although similar sites are required to be treated similarly, Staff has proposed unprecedented cleanup levels for the Site, while setting much less stringent levels at other similarly situated sites. Response to NASSCO's RFAs, at 56. Since the early 1990s, the Regional Board has remediated sediments at a number of shipyards, boatyards and other industrial sites in San Diego Bay. Many of these sites, including the Commercial Basin Boatyards, Paco Terminals, Convair Lagoon, and Campbell Shipyard, are similar to NASSCO in many respects, including but not limited to geographical location, water quality considerations, uses, wastes, beneficial uses, and receptors of concern. Barker Depo, at 118:14 – 140:1; 346:25 – 352:15; 354:22 – 361:18; 385:17 – 387:4, 564:25 – 565:23, 567:7 – 567:16; see also Barker Depo, Ex. 1210 at Exhibit A. In particular, Campbell and NASSCO have similar physical, biological and chemical conditions, locations, site activities, waste materials and matrices, offsite pollutant inputs, and hydrodynamic and biogeographic zones. Barker Depo, at 362:15 – 365:5. Yet, in spite of these similarities, the cleanup levels proposed for NASSCO are far more stringent than those of the other sites, including Campbell Shipyard, for the same constituents. See e.g., Barker Depo, 365:8 – 365:23.

For example, at Paco Terminals, Campbell Shipyard, and the Commercial Basin Boatyards requiring cleanup, the copper cleanup levels were 1000 mg/kg, 810 mg/kg, and 530mg/kg, respectively. Thus the copper cleanup levels for all of these sites are well above the post-remedial Surface-Area Weighted Average Concentration ("SWAC") (159 mg/kg) and dredge concentrations (121 mg/kg) proposed for NASSCO. Similarly, the mercury cleanup levels set for the Commercial Basin boatyards that required remediation were 4.8 mg/kg, which is once again almost ten times above the post-remedial SWAC (0.68) and dredge concentration (0.57) proposed for NASSCO. Cleanup levels for primary risk drivers, such as PCBs and TBT, are also significantly more stringent at NASSCO compared with Campbell. Barker Depo, Ex. 1210 at Exhibit A.

To reach these low cleanup levels, Staff has introduced excessive levels of conservatism in its analysis. For example, Staff calculated cleanup levels for Campbell using an apparent effects approach; however, at NASSCO, Staff used the lowest apparent effects threshold, and then introduced a 40% safety buffer to further reduce the cleanup level, resulting in exceptionally low cleanup levels compared to other sites in the bay. Barker Depo, 373:14 – 374:22. Moreover,



cleanup levels at NASSCO are also more stringent than similar sites elsewhere in the nation. Barker Depo, at 944:18 – 947:11, 47:16 – 949:21.

ID 35

NASSCO commented that The Regional Board is required to adopt a technically and legally sound TCAO based upon an accurate risk-based assessment, and reasonable assumptions, in accordance with Resolution No. 92-49. In light of the generally favorable site conditions and total values at stake, monitored natural attenuation-which has already been shown to be occurring-is the proper remedy for the NASSCO Site.

ID 133

NASSCO commented that Water Code section 13304 allows dischargers to cleanup or abate the effects of wastes. Further, under such circumstances, section 13304, which requires a discharger to “cleanup or abate the effects of the waste,” provides that wastes need not be cleaned up if the effects can be abated, and implicitly acknowledges that cleanup levels can and should be based on site-specific science and risk assessments. In light of these parameters and for the reasons discussed in detail below, active remediation at the NASSCO shipyard, as described in the TCAO and DTR, is not supported by the record.

ID 134

NASSCO commented that the Regional Board must consider the totality of factors affecting water quality in selecting cleanup levels under Resolution No. 92-49, including economic and technological feasibility. Resolution 92-49 provides guidance to Regional Boards concerning the application of Water Code Section 13304. The State Board has described the analysis required by Resolution 92-49 as follows:

Resolution 92-49 directs the RWQCBs to ensure that water affected by an unauthorized release attains either background water quality or the best water quality which is reasonable if background water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background . . . any such cleanup level shall (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less stringent than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

See Resolution 92-49, at III. G. See also, In the Matter of the Petition of Unocal Corporation, State Board Order No. WQ 98-12, at 2 (quoting Resolution 92-49); In the Matter of the Petition of Landis Incorporated, State board Order No. WQ 98-13, at 2 (same); In the Matter of the Petition of Unocal Corporation, Order No. 99-10, at 2; In the Matter of the Petition of Chevron Pipe Line Company, State Board Order No. WQ 2002-0002; In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, at 4.

Further, the text of Resolution 92-49 requires an analysis of cost-effectiveness and technological and economic feasibility in determining cleanup levels. See Resolution 92-49, at 6-7 (“The Regional Water Board shall . . . ensure that dischargers shall have the opportunity to select cost-

effective methods for . . . cleaning up or abating the effects [of wastes discharged and] . . . require the discharger to consider the effectiveness, feasibility, and relative costs of applicable alternative methods for investigation, cleanup and abatement.”) (emphasis added). For the reasons discussed below, active remediation is not economically or technologically feasible within the meaning of Resolution 92-49; rather, monitored natural attenuation is the appropriate remedial alternative considering the demands being made and to be made on the waters at the Site, and the total values involved—beneficial and detrimental, economic and social, and tangible and intangible.

ID 39

Coastkeeper and EHC commented that the law requires cleanup to background except where evidence in the record demonstrates that alternative cleanup levels greater than background water quality are appropriate. The State Water Resources Control Board has empowered the Regional Boards "to require complete cleanup of all waste discharged and restoration of affected water to background conditions (i.e., the water quality that existed before the discharge)." See State Water Board Order 92-49. When ordering a cleanup, the Regional Board must "[e]nsure that dischargers are required to clean up and abate the effects of discharges" to "either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." State Water Board Order 92-49. Therefore, cleanup must be set to background pollutant levels unless background water quality "cannot be restored."

ID 40

The law provides that the Regional Board can establish alternative cleanup levels for constituents greater than background pollutant levels only if the Regional Board makes two findings. First, it must find "that it is technologically or economically infeasible to achieve the background value for that constituent." The Post Remedial Monitoring plan should be expanded to provide a more robust basis for evaluating exposure of benthic invertebrates to contaminants at the site and for assessing sediment toxicity, and include testing from appropriate reference sites 2550.4(c). If cleanup to background is technologically or economically infeasible, a pollutant level greater than background conditions can be adopted only if the Regional Board finds "that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the concentration limit greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c). The cleanup levels must be set at background water quality if the Regional Board fails to make these two findings for each pollutant.

ID 41

The law governing alternative cleanup levels makes clear that the alternative cleanup levels **MUST** set a concentration limit, or maximum pollutant amount that cannot be exceeded. The Regional Board must find that the constituent will not pose a threat to human health or the environment "as long as the **CONCENTRATION LIMIT** greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c) (emphasis added). Therefore, alternative cleanup levels that are not set at a maximum pollutant level are unlawful. •

The law also dictates that analyzing whether background levels are achievable and what alternative cleanup levels are appropriate must be done on a constituent-by-constituent basis. See CAL. CODE REGS. tit. 23 § 2550.4(c) (The Regional Board must determine technological and economic feasibility "to achieve the background value FOR THAT CONSTITUENT" and find that "THE CONSTITUENT will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded." (emphasis added)).

Finally, State Water Board Order 92-49 requires that any alternative cleanup level:

- 1) must be consistent with the maximum benefit to the people of the state;
- 2) must not unreasonably affect present and anticipated beneficial uses of the waterbody;  
and
- 3) must not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

ID 42

Decisions of the Regional Board must be made on a reasoned basis and be supported by evidence in the record. A reviewing court will overturn a Regional Board decision "if the court determines that the findings are not supported by the weight of the evidence." CAL. Civ.

PROC. CODE § 1094.5(c). For an agency finding to be upheld, the agency's findings must be "supported by substantial evidence" in the record. See *JKH Enter, v. Dep't of Industrial Relations*. 48 Cal. Rptr. 3d 563. 574 (Cal. Ct. App. 2006).

Therefore, in order to set a cleanup level at less than background water quality, the Regional Board's finding of technical or economic infeasibility must be supported by substantial evidence in the record. Also, there must be substantial evidence in the record demonstrating (1) that the remaining pollutant levels "will not pose a substantial present or potential hazard to human health or the environment as long as the concentration limit greater than background is not exceeded." Cal. Code Regs. tit. 23 §2550.4(c), (2) that the alternative cleanup levels are consistent with the maximum benefit to the people of the state; (3) that the alternative cleanup levels will not unreasonably affect present and anticipated beneficial uses of San Diego Bay; and (4) the alternative cleanup levels will not result in water quality less than that prescribed in the State and Regional Boards' Water Quality Control Plans and Policies. See State Water Board Order 92-49.

ID 54

The economic feasibility analysis fails to calculate or present the data on a pollutant-by-pollutant basis. But the law requires that economic feasibility be determined on a pollutant-by-pollutant basis. See CAL. CODE REGS. Title. 23 § 2550.4(c) (The Regional Board must determine technological and economic feasibility "to achieve the background value for that constituent and find that "the constituent will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded." (emphasis added)).

ID 108

Coastkeeper and EHC concluded that the Order and DTR fail to demonstrate based on substantial evidence in the record that cleanup to background concentrations is not economically

feasible. The proposed cleanup fails to meet legal requirements for a cleanup to a pollutant level greater than background and does not represent a cleanup to the best water quality which is reasonable "considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." See State Water Board Order 92-49. However, minor changes in alternative cleanup level implementation, monitoring requirements, and the remedial footprint can transform the proposed cleanup into a cleanup that is both legal and the protective of existing and anticipated beneficial uses in San Diego Bay.

ID 418

In rebuttal, BAE Systems commented that contrary to Coastkeeper's and EHC's commentes, the Regional Board applied the correct legal standard. SDC and EHC argue that the Regional Board applied the improper legal standard in determining the appropriate cleanup level at the Shipyard Site, improperly reached the conclusion that cleanup to background is not economically feasible, improperly formulated the DTR-recommended cleanup levels, and failed to ensure that the DTR-recommended cleanup levels achieve the best water quality reasonable. Their position, however, reflects a fundamental misunderstanding of the applicable legal standards, site data, and the technical approaches used by the Regional Board in the DTR. As set forth more fully below, the Regional Board applied the correct legal standard, based its finding that cleanup to background is not economically feasible on a well-reasoned analysis of cost effectiveness, and set appropriate cleanup levels that do not unreasonably impair the beneficial uses of the water. For these reasons, which are more fully addressed below, SDC and EHC's comments lack credence and should be rejected.

ID 419

BAE Systems provided the following rebuttal to Coastkeeper's and EHC's comment that alternative cleanup levels can only be established if the Regional Board makes two findings. The Act [Porter-Cologne] and implementing regulations, however, do not support their position. Rather, where background is not technologically or economically feasible, the Regional Board is only required to set an alternative cleanup level where the beneficial uses of the water are not unreasonably impaired.

First, SDC and EHC's position fails to recognize that if the alternative cleanup level does not unreasonably affect the beneficial uses, it is not considered "a condition of pollution or nuisance," which is a prerequisite to the Regional Board's exercise of authority under the Act. See Cal. Water Code § 13304(a). The California Water Code, as well as the Federal Clean Water Act, recognize that industrial discharges are acceptable as long as they do not unreasonably impair other beneficial uses. See, e.g., *S. Fl. Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, 102 (2004) (noting that "the [Federal Clean Water] Act prohibits 'the discharge of any pollutant by any person' unless done in compliance with some provision of the Act"). As more fully explained below and in BAE Systems' May 23, 2011 Comments, Site sediments do not pose any unacceptable risk to aquatic life, aquatic-dependent wildlife, or human health, and do not unreasonably affect the beneficial uses of the water. Because the alternative cleanup levels set forth in the DTR do not unreasonably affect the beneficial uses of the water, they are acceptable.

Second, the Regional Board is not required to determine the appropriate cleanup level irrespective of the associated costs with cleanup. In fact, the Regional Board is required to balance the impact on the environment against the technological and economical costs associated with a cleanup to determine a level of remediation that is reasonable and cost-effective. For example, California Water Code § 13304 requires dischargers to either “clean up the waste or abate the effects of the waste . . . .” Cal. Water Code § 13304(a) (emphasis added). This makes it clear that abatement of the effects of waste, rather than remediation to background, can accomplish the goals of the Porter-Cologne Water Quality Control Act in the same manner as remediation to background. The State Water Board’s guidance is no different. Specifically, State Water Board Resolution No. 92-49 does not require cleanup to background unless it is both technologically and economically feasible: the Regional Board “shall . . . ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible . . . .” State Water Board Resolution No. 92-49, § III(G) (emphasis added).

Similarly, the Act requires that the State Water Board develop guidelines and procedures for regional boards that “include . . . [p]rocedures for identifying and utilizing the most cost-effective methods . . . for cleaning up or abating the effects of contamination or pollution.” Water Code § 13307(a)(3). This makes clear that abating the effects of contamination must be tempered by cost considerations. Thus, contrary to SDC and EHC’s position, the DTR correctly states that the Water Code permits “an alternative cleanup level less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible – as long as the less stringent cleanup level is protective of beneficial uses.” (DTR § 32.1.) As set forth more fully below, there is substantial evidence that (1) cleanup to background is not technologically or economically feasible, (2) the alternative cleanup level is protective of the beneficial uses at the site, and (3) monitored natural attenuation is the most cost-effective method for achieving the cleanup goals articulated in the TCAO.

ID 420

BAE Systems provided the following rebuttal to Coastkeeper's and EHC's comment that the Regional Board is required to set a concentration limit, and that this must be done on a constituent-by-constituent basis. In support of their position, SDC and EHC rely on § 2550.4 of Title 23 of the California Code of Regulations. While it is true that Resolution No. 92-49, in part, incorporates the provisions of Chapter 15, the State Water Board advises implementation of those provisions only if the cleanup and abatement “involves corrective action at a waste management unit regulated by waste discharge requirements issued under Chapter 15.” Resolution No. 92-49, § III(F)(2) (emphasis added). Furthermore, Chapter 15, which is titled “Discharges of Hazardous Waste to Land,” states in pertinent part:

The regulations in this article apply to owners or operators of facilities that treat, store, or dispose of hazardous waste at Class I waste management units. . . . Furthermore, § 2550.4 of this article also applies to all determinations of alternative cleanup levels for unpermitted discharges to land of hazardous waste, pursuant to ¶ III.G. of Resolution No. 92-49 . . . .

Calif. Code Regs. tit. 23 § 2550.0. The designated parties in the instant proceedings are not considered Class I waste management units, nor do the determinations at issue here relate to unpermitted discharges to land. Furthermore, the provisions contained within Chapter 15 were clearly designed to be instructive guidelines for waste treatment, storage, and disposal facilities, not for sediment remediations. Technical elements for establishing water quality protection standards, monitoring programs, and corrective action programs for releases from waste management units, like those set forth in Chapter 15, are simply not useful in the context of sediment remediation. Thus, to the extent Section 2550.4 addresses concentration limits or constituent-specific cleanup, it is limited to the context of waste discharge and monitoring requirements, and does not apply here.

To the extent that Section 2550.4 does apply, it does so only to reinforce the guidance contained in Resolution No. 92-49, and the general requirement that alternative cleanup levels set above background levels adequately protect the beneficial uses of the water. As already explained, the Regional Board is required only to ensure that the cleanup levels ultimately ordered are economically feasible and adequately protective of the beneficial uses. See, e.g., State Water Resources Control Board Memorandum From Craig Wilson To John Robertus (February 22, 2002), at SAR097571- 81 (“Wilson Memo”) (noting that Resolution 92-49 is flexible and making no mention of any requirement to set alternative cleanup levels or analyze economic or technological feasibility on a constituent-by-constituent basis) Contrary to SDC and EHC’s position, meeting the standard of Resolution No. 92-49 does not require that cleanup levels be set or economical feasibility be assessed on a constituent-by-constituent basis. Tellingly, SDC and EHC fail to point to any decisions or other CAOs where the Regional Board, or another tribunal, construed Resolution No. 92-49 in such a way.

Finally, and perhaps most importantly, requiring remediation on a constituent-by-constituent basis irrespective of economic feasibility, as urged by SDC and EHC, would likely result in remediation at a level more stringent than background. Not only is this not required under the Act, Resolution 92-49 specifically forbids it: “under no circumstances shall these provisions be interpreted to require cleanup and abatement which achieves water quality conditions that are better than background conditions.” (Section III(F)(1) (emphasis added).)

As discussed more fully below, the DTR sets alternative levels on a constituent-by-constituent basis for both primary COCs and secondary COCs, and does so after a careful weighing of the objectives of the Act against the economic feasibility of remediating to background. Accordingly, SDC and EHC’s position that the DTR is inadequate in this regard should be rejected.

ID 438

In conclusion, BAE Systems commented that as set forth above, the Regional Board applied the correct legal standard, based its finding that cleanup to background is not economically feasible on a well-reasoned analysis of cost effectiveness, and set appropriate cleanup levels that do not unreasonably impair the beneficial uses of the water. Accordingly, SDC and EHC’s comments lack credence and should be rejected.

ID 291

In rebuttal to Coastkeeper's and EHC's comments, NASSCO commented that the Water Code allows dischargers to clean up or abate the effects of wastes, and that EHC/Coastkeeper misstates the applicable legal standard to the extent that they suggest the Water Code sets forth a rebuttable presumption of cleanup to background in all cases. Rather, the Water Code section 13304 requires a discharger to “clean up or abate the effects of the waste . . .” (emphasis added). Although the statute is often misquoted by using the conjunctive “and” in place of the disjunctive “or” (for example, when referring to a “cleanup and abatement order”), the legislature’s deliberate use of the disjunctive word “or” in the statute makes clear that wastes need not be cleaned up if the effects can be abated. Accordingly, the plain language of section 13304 supports the conclusion that a cleanup under section 13304 can be based on abating the effects of the waste, without remediating to background chemical levels.

In fact, the express language of the statute indicates that cleanup levels above background are acceptable if the sediment does not unreasonably affect beneficial uses, and therefore fails to constitute either “pollution” or a “nuisance.” Specifically, the Regional Board’s jurisdiction under Section 13304 is triggered where a discharge “creates, or threatens to create, a condition of pollution or nuisance,” and it is on this basis that the Regional Board has issued the instant TCAO. Wat. Code § 13304; TCAO, at Finding 1 (alleging conditions of contamination and nuisance that adversely affect aquatic-life, aquatic-dependent wildlife, and human health beneficial uses). As discussed in NASSCO’s Comment Nos. 10 and 11 (NASSCO’s Comments on the San Diego Regional Water Quality Control Board Cleanup Team’s September 15, 2010 Tentative Cleanup and Abatement Order No. R9-2011-0001, Draft Technical Report, and Shipyard Administrative Record, May 26, 2011, “NASSCO’s Initial Comments”), the Water Code recognizes that beneficial uses are not unreasonably impaired by all changes to chemical concentrations in sediments, and that certain concentrations may be above background conditions, yet not constitute a state of “pollution” or “nuisance.”

NASSCO's second point is that the Water Code implicitly recognizes that industrial discharges are permissible as long as they do not unreasonably impair other beneficial uses. The Water Code also implicitly recognizes that industrial uses, including industrial discharges, are acceptable uses of water bodies as long as discharges from those facilities do not unreasonably impair other beneficial uses. If this were not so, permits for the discharge of any wastewater would be denied since there is at least some impact on waters associated with any discharge. Interpreting the statute to require cleanup to background sediment chemistry regardless of the effect of the contaminants on beneficial uses ignores these realities, reads the word “unreasonably” out of the definition of pollution, and effectively imposes a “zero discharge” requirement on all industrial dischargers—an obviously unreasonable result. (“Pollution” means an “alteration of the quality of the water of the state by waste to a degree which unreasonably affects . . . beneficial uses”). Wat. Code § 13050(1) (emphasis added){Notably, other Regional Boards have not invoked Resolution No. 92-49 to require that sediment must be cleaned to background. See San Diego Regional Board Order Nos. 88-86, 88-78, 89-31, 94-100, 94-101, 94-102, 95-21, 97-63, 99-06, 2001-303, R9-2002-72. See also In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, State Water Board, September 17, 1992 (“Paco Terminals”). Instead, the Regional Board calibrated cleanup levels to be protective of beneficial uses, regardless of whether that level was at background

concentrations or above.}. Similarly, the legislative history of the Porter-Cologne Act confirms that the Regional Boards must balance economic and water quality interests, and that, although “waste disposal and assimilation are not included in the definition of beneficial uses, . . . they are recognized as part of the necessary facts of life, to be evaluated and subject to reasonable consideration and action by regional boards.” See Recommended Changes in Water Quality Control, Final Report of the Study Panel to the California State Water Quality Control Board, Prepared for the California Legislature, March 1969, at Appendix A, at 21. See also, *id.* at 7 (requiring balancing of interests); *id.* at Appendix A at 26 (“[I]t would be very confusing to refer to waste disposal, dispersion and assimilation as any kind of beneficial uses of water. However, this omission is not intended to question the obvious facts that ultimately the residual substances remaining after treatment of wastes must, in most instances, reach waters of the state, and economic benefits to a waste discharger . . . relate inversely to the cost of treatment. These economic values are recognized in paragraph 2 of Section 13000.”).

NASSCO's third point is that the Water Code mandates that Regional Boards use the most cost-effective methods for cleaning up or abating the effects of contamination or pollution. Water Code Section 13307, which authorizes the State Water Board to adopt policies for Regional Boards to follow in the oversight of cleanup and abatement activities, mandates that the State Water Board's policies “shall include . . . [p]rocedures for identifying and utilizing the most cost-effective methods . . . for cleaning up or abating the effects of contamination or pollution.” Wat. Code § 13307(a)(3). Thus, taken together, Water Code Sections 13304 and 13307 allow for the abatement of the effects of past discharges on water quality in the most cost-effective manner. Rather, the key inquiry is whether beneficial uses at the Site are unreasonably affected by the elevated sediment chemistry observed at the Site and/or whether site conditions (1) are injurious to health, indecent or offensive to the senses, or obstructs the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) affect at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) occur during, or as the result of, the treatment or disposal of wastes. Wat. Code §§ 13050(1)-(m). As discussed extensively in NASSCO's Initial Comments, Site sediments do not pose any unacceptable risk to aquatic life, aquatic-dependent wildlife, or human health, and do not unreasonably affect beneficial uses.

NASSCO commented that the Regional Board must consider the totality of factors affecting water quality in selecting alternative cleanup levels under Resolution No. 92-49, including economic and technological feasibility. Furthermore, Resolution No. 92-49 requires alternative cleanup levels to be protective of beneficial uses, but grants the Regional Board substantial discretion in determining alternative cleanup levels. To the extent that the Regional Board finds—despite substantial evidence to the contrary—that site conditions do create a condition of pollution or nuisance, the plain terms of Resolution 92-49 do not require cleanup to background unless it is both technologically and economically feasible (i.e., cost-effective) to do so. Specifically, Resolution 92-49 provides that the Regional Board “shall . . . ensure that discharges are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made



on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. . . .”

The State Water Board has described the analysis required by Resolution 92-49 as follows:

Resolution 92-49 directs the RWQCBs to ensure that water affected by an unauthorized release attains either background water quality or the best water quality which is reasonable if background water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved,, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background . . . any such cleanup level shall (1) be consistent with the maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less stringent than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

Resolution 92-49, at III.G. See also, In the Matter of the Petition of Unocal Corporation, State Board Order No. WQ 98-12, at 2 (quoting Resolution 92-49); In the Matter of the Petition of Landis Incorporated, State board Order No. WQ 98-13, at 2 (same); In the Matter of the Petition of Unocal Corporation, Order No. 99-10, at 2; In the Matter of the Petition of Chevron Pipe Line Company, State Board Order No. WQ 2002-0002; In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, at 4.

Further, the text of Resolution 92-49 requires an analysis of cost-effectiveness and technological and economic feasibility in determining cleanup levels. See Resolution 92-49, at 6-7 (“The Regional Water Board shall . . . ensure that dischargers shall have the opportunity to select cost-effective methods for . . . cleaning up or abating the effects [of wastes discharged and] . . . require the discharger to consider the effectiveness, feasibility, and relative costs of applicable alternative methods for investigation, cleanup and abatement.”) (emphasis added).

NASSCO next alleged that there is substantial evidence in the record that cleanup to background is infeasible, beneficial uses at the site are not impaired, and monitored natural attenuation will achieve cleanup goals. As discussed in NASSCO’s Initial Comments, active remediation is not economically or technologically feasible within the meaning of Resolution 92-49; rather, monitored natural attenuation is the appropriate remedial alternative considering the demands being made and to be made on the waters at the Site, and the total values involved—beneficial and detrimental, economic and social, and tangible and intangible. To the extent the regulatory scheme requires cleanup to background unless economically and technologically infeasible, there exists substantial evidence in the record demonstrating that (1) beneficial uses at the site are not impaired, (2) monitored natural attenuation will achieve the cleanup goals articulated in the TCAO in the most cost-effective manner, and (3) cleanup to background is not feasible, both economically and technologically.

NASSCO provided the following rebuttal to Coastkeeper's and EHC's comment that section 2550.4 of the California Code of Regulations requires that cleanup levels must be set to background water quality, unless the Regional Board analyzes economic and technological feasibility on a pollutant-by-pollutant basis, and determines that cleanup to background is either

economically or technologically infeasible on a pollutant-by-pollutant basis. Tellingly, Resolution 92-49 has been in existence for decades; yet, no Regional Board, State Board, or court appears to have ever interpreted it in the manner EHC/Coastkeeper now suggest.

This is because, under Resolution 92-29, the Regional Board “may prescribe an alternative cleanup level less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible – as long as the less stringent cleanup level is protective of beneficial uses.” Draft Technical Report (“DTR”), at 32-3. Additionally, the State Board grants substantial discretion to Regional Boards in setting alternative cleanup levels under Resolution 92-49. In sum, Resolution 92-49 is intended to ensure that any alternative cleanup levels are protective, and that cleanups are cost-effective. Requiring constituent-by-constituent economic and technological feasibility analyses would make no sense considering the practicalities of sediment cleanup, and would be contrary to the Regional Board’s obligation to take into account “the resources, both financial and technical, available to the person[s] responsible for the discharge” in overseeing investigations and cleanups under Resolution 92-49.

Citing Resolution 92-49, EHC/Coastkeeper argues that Section 2550.4 of the California Code of Regulations governs the setting of alternative cleanup levels for the Site, and requires the Regional Board to select concentration limits for each constituent subject to remediation. Resolution 92-49, at III.G. (“[I]n approving any alternative cleanup levels less stringent than background, apply Section 2550.4 of Chapter 15 . . .; any such alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.”). As discussed below, Section 2550.4 does not operate to require constituent-by-constituent analysis in this cleanup.

Chapter 15, including Section 2550.4, was not designed as general guidance for sediment remediation; rather it sets forth detailed siting, construction, monitoring, and closure requirements for existing and new waste treatment, storage, and disposal facilities. Thus, Chapter 15 provides technical criteria for establishing water quality protection standards, monitoring programs, and corrective action programs for releases from waste management units, much of which is inapplicable to sediment remediation.

The explicit terms of Resolution 92-49 also provides that “discharges subject to [Water Code] Section 13304 may include discharges of waste to land; such discharges may cause, or threaten to cause, conditions of soil or water pollution or nuisance that are analogous to conditions associated with migration of waste or fluid from a waste management unit.” In such cases, Resolution 92-49 provides that the Regional Board should implement the provisions of Chapter 15, only to the extent applicable to cleanup and abatement, as follows:

(a) If cleanup and abatement involves corrective action at a waste management unit regulated by waste discharge requirements issued under Chapter 15 the Regional Water Board shall implement the provisions of that chapter;

(b) If cleanup and abatement involves removal of waste from the immediate place of release and discharge of the waste to land for treatment, storage or disposal, the Regional Water Board shall regulate the discharge of the waste through waste discharge requirements issued under Chapter 15, provided that the Regional Water Board may waive waste discharge requirements under WC Section 13269 if the waiver is not against the public interest (e.g. if the discharge is for short-term treatment or storage, and if the temporary waste management unit is equipped with features that will ensure full and complete containment of the waste for the treatment or storage period); and

(c) If cleanup and abatement involves actions other than removal of the waste, such as containment of waste in soil or ground water by physical or hydrological barriers to migration (natural or engineered), or in-situ treatment (e.g. chemical or thermal fixation or bioremediation), the Regional Water Board shall apply the applicable provisions of Chapter 15 to the extent that it is technologically and economically feasible to do so.  
Resolution 92-49, at III.F.

However, because Chapter 15 was developed to address releases from hazardous waste management units, not to articulate goals for the remediation of sediment, the State Board recognizes that Chapter 15 applies to cleanups only to the extent “feasible.”

Here, there is no basis for analogizing the Site to a waste management unit, particularly since the site sediments were found not pose risks to aquatic, aquatic-dependent wildlife, or human health beneficial uses in an extensive and unparalleled sediment investigation, conducted with substantial oversight from the Regional Board. Moreover, cleanup and abatement actions are explicitly exempted from the provisions of Section 2550.4, provided that “remedial actions intended to contain such wastes at the place of release shall implement applicable provisions of [Chapter 15] to the extent feasible.” 23 Cal. Code Regs. § 2511.

Additionally, Chapter 15 also provides that “alternatives to construction or prescriptive standards contained in this chapter may be considered. Alternatives shall . . . be approved where the discharger demonstrates that (1) the construction or prescriptive standard is not feasible as provided in subsection (c) of this section, and (2) there is a specific engineered alternative that (A) is consistent with the performance goal addressed by the particular construction or prescriptive standard; and (B) affords equivalent protection against water quality impairment.”). In fact, Chapter 15 itself provides that it is not feasible to comply with a prescriptive standard in Chapter 15 if it “(1) is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives which meet the criteria [described above]; or (2) is impractical and will not promote the attainment of applicable performance standards. Regional Boards shall consider all relevant technical and economic factors including, but not limited to, present and projected costs of compliance . . .” 23 Cal. Code Regs. §2510.

Application of Chapter 15, including the requirements of section 2550.4, in the manner EHC/Coastkeeper suggests is clearly not “feasible.” *Id.*; 23 CCR § 2511; Resolution 92-29, at III.F. First, it is impractical to conduct distinct analyses of alternative cleanup levels for each individual pollutant where substantial evidence demonstrates that secondary pollutants are co-located with primary pollutants and will be remediated to protective levels in a common

footprint. Similarly, conducting economic and technological feasibility analyses on a pollutant-by-pollutant basis is economically infeasible, and nonsensical given the engineering realities of dredging.

NASSCO commented that the Regional Boards have substantial discretion to select alternative cleanup levels, provided that they are protective. As discussed above, Section 2550.4 relates to waste discharge and monitoring requirements for hazardous waste management units, and in-situ containment of wastes, to the extent “feasible”; however, even to the extent that the Regional Board must apply these requirements in approving alternative cleanup levels, the applicable requirements pertain, at best, to water quality monitoring with respect to in situ remediation of waste discharges. As discussed above, Section 2550.4 addresses concentration limits in the context of waste discharge and monitoring requirements, and is intended only to ensure that alternative cleanup levels set above background levels are adequately protective. This understanding is confirmed by State Water Board guidance, which states that:

Resolution 92-49 is flexible and permits a regional board to set alternative cleanup levels less stringent than background concentrations if attainment of background concentrations is infeasible. Any such alternative cleanup level may not unreasonably affect beneficial uses and must comply with all applicable Water Quality Control Plans and Policies. The Resolution allows for consideration of adverse impacts of any cleanup itself as well as natural attenuation if cleanup goals can be met in a reasonable time.

State Water Board Memorandum From Craig Wilson To John Robertus (February 22, 2002), at SAR097571- 81) (“Wilson Memo”). Notably, although the Wilson Memo references Section 2550.4, it makes no direct mention of any requirement to set alternative cleanup levels, or analyze economic or technological feasibility, on a constituent-by-constituent basis. *Id.* In fact, it provides that the Regional Board has “substantial” discretion in setting alternative cleanup levels, and notes that Resolution 92-49 requires alternative cleanup levels less stringent than background to “be consistent with maximum benefit to people of the state” and requires consideration of “all demands being made and to be made on the waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Wilson Memo, at SAR097579. Further, this determination is to be “made on a case-by-case basis, and is based on considerations of reasonableness under the circumstances at the site.” *Id.* Thus, to the extent that Section 2550.4 is applicable to the cleanup and abatement of sediment contamination, EHC/Coastkeeper clearly misinterprets Section 2550.4 as requiring alternative cleanup levels (and the concomitant economic and technological feasibility analyses) to be conducted on a pollutant by pollutant basis.

Rather, section 2550.4 addresses concentration limits in the context of waste discharge and monitoring requirements, and is intended only to ensure that alternative cleanup levels set above background levels are adequately protective. That is, to the extent applicable to cleanup levels, Section 2550.4 simply requires the Regional Board to (1) set alternative cleanup levels at the lowest level that are economically and technologically feasible, and (2) ensure that concentrations of contaminants at such levels “do not pose a substantial present or potential hazard to human health or the environment” (i.e., ensures that the cleanup level is protective of beneficial uses). Here, the Regional Board has set excessively conservative cleanup levels that

are protective of human health and the environment, which, if anything, will require the parties to expend much more than is economically feasible, at considerable expense to the parties named on the TCAO. See, e.g., NASSCO and Southwest Marine Detailed Sediment Investigation, Exponent (October 2003) (“Exponent Report”), at 19-13; Deposition of David Barker (“Barker Depo”), at 204:21 – 206:6.

Additionally, in selecting the alternative cleanup levels, the Regional Board has expressly considered the applicable requirements of Resolution 92-49 and California Code of Regulations section 2550.4. TCAO, at Finding 32; DTR, at pp. 32-1 – 32-2. In doing so, the Regional Board set alternative levels on a constituent-specific basis for both primary COCs and secondary COCs. Primary COCs are those associated with the greatest exceedance of background, and the highest magnitude of potential risk at the Site. Cleanup levels for primary COCs, were set using the post-remedial SWAC as a concentration limit. TCAO, at Section 32. Secondary COCs, which are associated with lower exceedances of background, were also extensively and individually evaluated, and were found to be highly correlated with Primary COCs and thus adequately addressed in the common footprint. The Regional Board also assessed risk to wildlife receptors under projected post-remedial conditions, and confirmed that the alternative cleanup levels adequately protect aquatic-dependent wildlife and human health beneficial uses. DTR, at Section 32. By contrast, EHC/Coastkeeper has provided no credible evidence that concentrations below the proposed alternative cleanup levels, but above background, pose “substantial present or potential hazard to human health or the environment.”

NASSCO commented that Coastkeeper and EHC cited no precedent supporting its interpretation of Resolution No. 92-49. NASSCO stated that it was aware of no cleanups where the Regional Board has required separate alternative cleanup level or feasibility analyses for each and every constituent involved, particularly where distinct constituents are correlated, as here. Nor has EHC/Coastkeeper pointed to any State Board or court decisions supporting its novel interpretation of Resolution 92-49. For the foregoing reasons, Resolution 92-49 does not require constituent-by-constituent analysis of alternative cleanup levels, or economic or technological feasibility, and EHC/Coastkeeper’s comment is without merit.

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NASSCO provided the following rebuttal to Coastkeeper's and EHC's comment that alternative cleanup levels set by the Regional Board are insufficiently protective, and the corresponding implication that cleanup to background is technologically and economically feasible. NASSCO further alleged that assessment of impacts to beneficial uses and economic feasibility analysis under Resolution No. 92-49 support monitored natural attenuation as the appropriate remedy.

EHC/Coastkeeper correctly notes that an agency’s findings must be supported by the weight of the evidence in the record. However, EHC/Coastkeeper’s specific contentions that the alternative cleanup levels set by the Regional Board are insufficiently protective, and the corresponding implication that cleanup to background is technologically and economically feasible, are without merit.

In fact, considering that the results of the sediment investigation showed that “aquatic life, aquatic-dependent wildlife, and human health beneficial uses are at approximately 95 percent of

ideal conditions, and active remedial alternatives will result in improvements that are minimal—on the order of only a percent or so”—any active remediation, including cleanup to background, is economically infeasible. Additionally, there is evidence in the record that cleanup to background is technologically infeasible. Barker Depo, at 246:11 – 248:3 (describing dredging of the volume of sediments required to reach background levels as “an expensive challenge” and noting that “the board has not had regulatory experience with dealing with that volume of material . . .”). Exponent Report, at 19-13; Barker Depo, at 204:21 – 206:6 (“Q: So, solely for [the economic feasibility] step of the equation, if you have a negligible – negligible benefit on one side, I assume that there – anything more than a negligible cost would mean it’s not economically feasible. A. Right. . . . Q. If there’s absolutely no benefit of an incremental reduction in cleanup, then there’s no cost that would justify that, correct? . . . A: That type of scenario would – could support an alternative cleanup level to background. I don’t know if that’s what you’re asking. But that is a point where the board could make a decision that no further cleanup could be required

NASSCO rebutted Coastkeeper’s and EHC’s contention that additional cleanup beyond the TCAO footprint is economically feasible as follows. Resolution 92-49 defines the term “economic feasibility” as follows:

Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions. The evaluation of economic feasibility will include consideration of current, planned, or future land use, social, and economic impacts to the surrounding community including property owners other than the discharger. Economic feasibility, in this Policy, does not refer to the discharger’s ability to finance the cleanup. Availability of financial resources should be considered in the establishment of reasonable compliance schedules.

Resolution 92-49, at III.H.1.b. Additionally, as discussed in the DTR, analyzing economic feasibility involves “estimating the costs to remediate constituents of concern at a site to background and the costs of implementing other alternative remedial levels. An economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.” DTR, at 31-1.

NASSCO commented that the record is clear that cleanup to background is economically infeasible. EHC/Coastkeeper erroneously states that the record does not support a finding that cleanup to background is economically infeasible. Under Resolution 92-49, determining economic feasibility requires an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions. Further, Resolution 92-49 explicitly provides that “[e]conomic feasibility . . . does not refer to the discharger’s ability to finance cleanup;” rather, an economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits. Resolution 92-49, at III.H.

The DTR analysis compared incremental benefits of further cleanup, expressed in terms of exposure reduction to target receptors, with the incremental cost of achieving those benefits, and determined that the degree of exposure reduction does not justify the incremental cost of such

reductions, beyond approximately \$33 million. This analysis is consistent with the requirements of Resolution 92-49, and is supported by evidence in the record. Moreover, as discussed above, due to the generally favorable site conditions, any active remediation is economically infeasible under the terms set forth in Resolution 92-49. In fact, it is well-known that cleanup of sediment to background levels in San Diego Bay is economically infeasible: to date, because of economic infeasibility, none of the sediment sites in San Diego Bay have been remediated to background conditions. Cleanup Team's Responses and Objections To Designated Party BAE's First Set Of Requests for Admission, Admission Nos. 44 – 46 (admitting that it is economically and technologically infeasible to remediate the Site to background, and that the Regional Board has never required remediation to background sediment quality levels for any other site within the San Diego Bay).

The record contains no evidence that cleanup to background is economically feasible; in fact, EHC/Coastkeeper has not even provided evidence that cleanup to the alternative cleanup levels is economically feasible, let alone evidence supporting its position that cleanup to background levels is feasible.

NASSCO commented that no other sediment sites in San Diego Bay have been remediated to background. Moreover, EHC/Coastkeeper cannot point to a single sediment site in San Diego Bay that has been remediated to background levels; rather the consensus is clear, and the Regional Board's Sediment Site Cleanup Team ("Cleanup Team") admits, that cleanup to background is technologically and economically infeasible.

NASSCO's next point is that the alternative cleanup levels were selected based on an overly conservative interpretation of chemistry and biological data, not economic feasibility. EHC/Coastkeeper erroneously states that the economic feasibility analysis was the primary basis for the selection of the alternative cleanup levels; however, this is a patently false statement. The selection of alternative cleanup levels was based on the Regional Board's analyses of many factors, including ), including individual station and Site-wide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility. Further, based on these criteria, the selected cleanup levels are excessively conservative, as discussed extensively in NASSCO's Initial Comments.

Thus, contrary to EHC/Coastkeeper's assertions, the economic feasibility analysis was not intended to select a specific remedial scenario, and was not the primary basis for selection of any specific scenario. Rather, the analysis was intended to determine whether a point of diminishing returns on invested resources was apparent in the cost-benefit relationship, and then identify the most cost-effective level of effort—assuming that areas of higher contamination were preferentially selected for removal (as is typical). Accordingly, EHC/Coastkeeper's statement that "the economic feasibility analysis drives the entire cleanup" is incorrect. In actuality, the final selection of a remedial footprint in the DTR was based on simultaneous consideration of many factors (as is legally required under Resolution 92-49), including individual station and Sitewide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic

feasibility. In fact, considering the results of these analyses, the proposed cleanup is extremely conservative, as discussed in NASSCO's Initial Comments.

EHC/Coastkeeper's assertion that "the economic feasibility analysis in Section 31 determined the alternative cleanup levels" is a mischaracterization of the analysis in the DTR, which contains highly conservative analyses of individual station and Site-wide chemistry data, biological data (including toxicity tests, benthic community analysis, and SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility.

NASSCO alleges that the DTR conservatively estimated the costs of cleanup to alternative cleanup levels. The DTR (at p. 31-1) states that criteria including "total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife, and human health), effects on the shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources." EHC/Coastkeeper suggests that "benefits to human health, wildlife, aquatic-dependent wildlife, and other beneficial uses from removing pollutants" were not "quantified"; however, the economic feasibility analysis does quantify benefits in terms of exposure reduction. Further, using reasonable assumptions, such a quantification would not justify any active remediation. Extensive scientific investigation conducted at the shipyards, including the sediment quality investigation upon which the findings and conclusions of the TCAO are purportedly based, indicates that beneficial uses at the site are not unreasonably impaired and that active remediation would "result in improvements that are minimal—on the order of only a percent or so." Exponent Report, at 19-13.

Yet, active remediation, including the remediation described in the TCAO, would destroy existing mature and thriving benthic communities at the Site, and result in significant negative impacts to NASSCO and the surrounding community, including but not limited to (1) the potential to jeopardize the integrity of slopes and structures at the leasehold, (2) disruption of vital ship repair and construction activities that could result in delays or contractual breaches with the U.S. Navy and other customers, (3) increased truck traffic, (4) diesel emissions from trucks and heavy equipment, (5) noise, (6) accident risks, (7) transportation of large volumes of contaminated sediment through neighborhoods, and (8) the need to establish large staging areas for dewatering activities. Exponent Report, at §§ 18.2, 18.4; Barker Depo, at 306:22 – 307:21. Taking all of these factors into account suggests that the alternate cleanup levels are not economically feasible, and certainly do not weigh in favor of further cleanup.

NASSCO alleged that cleanup levels below the proposed alternative cleanup levels are not justified given the favorable site conditions, and are economically infeasible regardless of whether the eleven cost scenarios are analyzed independently, or in groups of six. The alternative cleanup levels are overly conservative, based on a series of excessively cautious assumptions concerning potential impacts to aquatic life, aquatic-dependent wildlife, and human health. The proposed economic feasibility analysis is similarly overly conservative, and requires cleanup well beyond the point at which the incremental benefits are justified by the incremental costs of further cleanup, considering that it has been demonstrated that monitored natural attenuation will ensure that the (excessively conservative) alternative cleanup levels are met



within a reasonable time. Thus, any cleanup beyond the point identified in the DTR is similarly economically infeasible, given the favorable conditions observed at the Site. This is so regardless of whether cleanup scenarios are assessed independently, or in groups of six, as discussed below.

The economic feasibility analysis was a theoretical exercise designed for a single purpose – to provide an incremental cost-benefit analysis for the full spectrum of cleanup possible at the Shipyard Site, including cleanup to background conditions. Eleven scenarios were evaluated based upon the Cleanup Team’s best professional judgment that eleven data points would be sufficient to establish a cost-benefit relationship. Additionally, the analysis required that each scenario represent a comparable incremental increase in the level of remedial effort necessary; thus, because 11 divides evenly into 66 (whereas 10 or 12 or 15 does not), using 11 data points facilitated assurance that each scenario represented a comparable incremental increase in level of effort. As described in the DTR, the Regional Board ordered all 66 polygons according to their composite SWAC ranking, which it determined was the best single metric for comparing relative COC levels (As described in the DTR, the sediment chemistry data used to calculate SWAC values for the economic feasibility analysis were the same data set used to assess all aspects of risk and beneficial use impairment at the Shipyard Site. Contrary to EHC/Coastkeeper's assertions, there are no "pollution reduction assumptions," other than the assumption that remediation areas under all scenarios will eventually equilibrate to background COC concentrations. Exposure reduction, as defined in the DTR, is simply the reduction in Sitewide SWAC that results from complete remediation of any specified area. It is an objective value, calculated mathematically from sediment chemistry data alone, and is not dependent on any given exposure scenario or assumptions. The exposure scenarios evaluated in both the human and aquatic-dependent wildlife risk assessments in the DTR are generally proportional to the Site-wide SWAC, therefore SWAC reduction is an appropriate metric for general conclusions about reduction of exposure and risk to human and wildlife receptors.). Each scenario was defined to be incrementally larger than the previous scenario by six polygons. Scenario 1 included the six most contaminated polygons (based on composite SWAC ranking), Scenario 2 included the 12 most contaminated polygons, Scenario 3 the 18 most contaminated polygons, etc. Scenario 11 included the entire Shipyard Site (66 polygons). This “worst first” approach provides a rational and direct manner in which to assess incremental net benefits of the full spectrum of potential cleanup effort.

Resolution 92-49 requires economic feasibility to be considered in setting appropriate cleanup levels, and requires the Regional Board to use best professional judgment in evaluating the point at which the incremental benefits of further cleanup are no longer justified by the incremental costs. Thus, selection of the point at which incremental benefits no longer justify incremental costs is primarily a policy decision, requiring best professional judgment, not a simple mathematical determination.

Here, however, regardless of whether the 11 hypothetical cost scenarios are grouped into five ranges or presented as 11 independent calculations, the underlying cost-benefit relationship is the same. In fact, EHC/Coastkeeper’s Figure 1, which depicts the eleven cost scenarios graphed individually, illustrates the same trend that is apparent in DTR Figure 31-1, and lends credence to Regional Board’s determination that cleanup to background is economically infeasible.

Specifically, under both scenarios, the benefit per dollar spent is relatively high and flat for the first three scenarios, but decreases dramatically with the additional cleanup associated with scenario 4 (i.e., above \$33 million total cost), suggesting that cleanup above \$33 million total cost is not economically feasible, given the minimal incremental benefits. In fact, cleanup beyond the economically feasible point as defined in the DTR results in an exposure reduction of less than 7 percent per \$10 million spent after \$33 million; less than 4 percent after \$45 million; and zero at \$185 million. Exposure reductions of merely a few percentage points do not justify the expenditure of tens of millions of dollars, and would clearly violate Resolution 92-49's economic feasibility provisions.

Moreover, the Cleanup Team's analysis is based on chemical concentrations only. If the best measure of water quality is used (i.e., direct measurements of toxicity and benthic community analyses at NASSCO), then there is no incremental benefit of dredging any areas at NASSCO; thus, the economically feasible remedy is natural attenuation.

NASSCO next rebutted Coastkeeper's and EHC's comment that Resolution No. 92-49 requires a constituent by constituent economic feasibility analysis. There is no requirement in Resolution 92-49 that requires a constituent-by-constituent economic feasibility analysis. Moreover, EHC/Coastkeeper's proposed constituent-by-constituent economic feasibility analysis is not scientifically valid.

EHC/Coastkeeper asserts that averaging the pollutant reduction concentration for the five primary COCs, as was done in the DTR masks variability in pollutant exposure reduction for individual pollutants, and suggests that, when pollutants are analyzed individually, progression from cost scenario 6 (\$69.5 million-\$85.3 million) to cost scenario 7 (\$85-\$101.6 million) results in "more than 20% exposure reduction in mercury." However, EHC/Coastkeeper's proposed constituent-by-constituent reanalysis of the economic feasibility data merely illustrates that the five COCs are not identically distributed across the site, without addressing the issue of net remedial cost-benefit. Attachment A, Exponent, Critique of Comments and Untimely Expert Evidence Offered by the Environmental Health Coalition and Coastkeeper, City of San Diego, San Diego Unified Port District, San Diego Gas & Electric, and the U.S. Navy (June 23, 2011) ("Exponent Critique"), at 2. It also confirms that incremental benefits generally decrease with increasing cost. *Id.*

Of particular concern, EHC/Coastkeeper's proposed reanalysis also obfuscates the net benefits, leading to absurd results and illustrating why this analysis is a poor standalone basis for selecting a remedy (something it was never intended to do). Specifically, EHC/Coastkeeper's proposed analysis fails to recognize that the mercury SWAC achieved in scenario 7 is actually well below the site-specific reference concentration (i.e., background UPL) for mercury. *Id.* Under current conditions, the mercury SWAC at the shipyard is not highly elevated relative to background (only 1.2x background UPL prior to any remediation), and very quickly approaches background as the highest composite SWAC polygons are remediated. Accordingly, at scenario 6, mercury is essentially at background. Under scenarios 7 to 11, the mercury SWAC is predicted to be below background, because the remaining unremediated stations all have mercury concentrations below the background UPL (see Figure 1, below). Scenarios 9 and 10 actually predict a rise in mercury SWAC with continued remediation, because areas with mercury levels below

background are being dredged and the dredged area is assumed to equilibrate to the higher background level after remediation. As a result, the apparent “reduction” in mercury exposure from scenario 6 to scenario 7 actually produces no benefit to the public relative to the reference condition (defined as 100% exposure reduction), at a cost of more than \$16 million.

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NASSCO also rebutted Coastkeeper’s and EHC’s comment regarding a statement in the TCAO that clean-up of the remedial footprint will restore any injury, destruction, or loss of natural resources. According to Coastkeeper and EHC, the San Diego Water Board does not have authority to conduct natural resource damage assessments because only the Natural Resources Trustees have authority to conduct natural resource damage assessments and to draw conclusions regarding injury to natural resources and the effectiveness of remedial actions in terms of restoring natural resource values.

NASSCO stated that the Regional Board is empowered to “coordinate with the state board and other regional boards, as well as other state agencies with responsibility for water quality, with respect to water quality control matters, including the prevention and abatement of water pollution and nuisance.” Water Code § 13225(a). Additionally, as EHC/Coastkeeper has pointed out, under Resolution 92-49, the Regional Board must ensure that constituents at concentrations below the alternative cleanup levels “will not pose a substantial present or potential hazard to human health or the environment,” and must also weigh factors including “the current and potential uses of surface waters in the area” and “the potential damage to wildlife [and] vegetation . . . caused by exposure to waste constituents.”

The Regional Board has extensively evaluated many of the types of effects that could constitute injury to natural resources at the Site, including exceedances of sediment quality guidelines, sediment toxicity, bioaccumulation, fish histopathology, and risks to wildlife from contaminated prey. Moreover, many of these analyses were developed cooperatively with input from designated Natural Resource Trustees, including U.S. Fish and Wildlife Service, California Department of Game, and the National Oceanographic and Atmospheric Administration. The Regional Board’s statement simply articulates that the cleanup of the remedial footprint at the Site will improve environmental conditions such that natural resources, including those evaluated in detail in connection with the Site investigation and cleanup (i.e., benthic macroinvertebrates, fish, and aquatic-dependent wildlife) will benefit from cleanup. Accordingly, it is appropriate and reasonable for the Regional Board to consider whether the cleanup will be protective of natural resources, including whether it will restore any injury, destruction, or loss of natural resources.

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BAE Systems also rebutted Coastkeeper’s and EHC’s Expert Report (MacDonald, 2011) regarding Natural Resource Trustees. BAE Systems commented that MacDonald lacks the qualification to render any opinions regarding what the Natural Resource Trustees may or may not do, and, therefore, his conclusion is inappropriate.

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BAE also commented on Resolution No. 92-49, stating that the Regional Board should review evidence with a view towards liability. To be named as a discharger, all that is required is “sufficient evidence” of responsibility. See The State Board Water Quality Enforcement Policy, No. 2002-0040, (Feb. 19, 2002). To this end, “a regional water board shall “[u]se any relevant evidence, whether direct or circumstantial” in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added). The resolution provides a number of potential sources of evidence, including site characteristics and location in relation to other potential sources of a discharge; hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality; industry-wide operational practices that have led to discharges, such as conveyance systems; and physical evidence, such as analytical data. (Id.)

In light of the Clean Water Act’s declared objective and the broad discretion granted to regional water boards by the Act and its implementing regulations, State Water Board decisions suggest that a regional water board should look at evidence with a view toward finding liability. According to the State Water Board, “[g]enerally speaking it is appropriate and responsible for a Regional Board to name all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility.” See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 11 (SWRCB 1985) (noting further that “substantial evidence” means “credible and reasonable evidence which indicates the named party has responsibility”); Stinnes-Western Chemical Corp., Order No. 86-16, at 12 (SWRCB 1986).

## **Response 1.1**

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### **The TCAO Correctly Applies The Requirements And Principles Of Water Code Section 13304 And Its Implementing Regulations.**

The Porter-Cologne Water Quality Control Act (Porter-Cologne) was enacted in 1969 with the Legislatively-declared objective of ensuring “that the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state.” Water Code § 13000. The State Water Board and the California Regional Water Boards, (collectively referred to as the Water Boards) have animated the Legislature’s concept of “use and enjoyment by the people of the state” by developing and defining what are known as “beneficial uses.” To help ensure the preservation and enhancement of beneficial uses, Porter-Cologne grants Water Boards broad latitude to issue Cleanup and Abatement Orders when necessary to protect California’s valuable and limited water resources from the effects of wastes. Water Code section 13304 (section 13304) governs the San Diego Water Board’s authority to issue CAOs. Section 13304 authorizes the San Diego Water Board to, in pertinent part, require any person who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, to “clean up the waste or abate the effects of the waste.”<sup>1</sup>

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<sup>1</sup> Section 13304 provides additional legal bases for water boards to issue CAOs, such as permit violations, but the TCAO’s findings allege, in each instance, that the basis for naming a specific discharger as a responsible party is that it caused or contributed to a condition of pollution or nuisance at the Shipyard Sediment Site.

As Designated Party BAE Systems accurately notes, regulations adopted by the State Water Board require that the Regional Water Boards name in a CAO all dischargers who contributed to a condition of pollution or nuisance to the maximum extent permitted by law. *See* 23 Cal. Code Regs. § 2907; *see also* Resolution No. 92-49, “Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304” (Resolution No. 92-49), § II (A)(4). As BAE Systems further notes, the Regional Water Boards are granted this broad authority precisely because of situations, such as the one now at issue, where contamination is discovered many years after the events causing the contamination. As stated by a leading treatise on California environmental law: “Due to the passage of time and the difficulty of interpreting hydrogeologic evidence, it often is impossible to establish who is responsible for the contamination with a great degree of certainty.” Kenneth A. Manaster and Daniel P. Selmi, *California Environmental Law and Land Use Practice*, § 32.32(1)(a), at p. 32-42. Accordingly, the San Diego Water Board should review the substantial evidence set forth in the DTR and administrative record with an eye towards naming dischargers to the TCAO to further the purposes of Porter-Cologne.

Water Code section 13050 defines “pollution” as an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either “the waters for beneficial uses[,]” or [f]acilities which serve these beneficial uses.”<sup>2</sup> Water Code section 13050(l). As the TCAO finds, each of the named dischargers caused and/or contributed to an alteration of the quality of the waters at the Shipyard Sediment Site to a degree that has unreasonably affected beneficial uses there.

None of the Designated Parties disagree with the finding that the quality of waters at the Shipyard Sediment Site has been altered by the discharge of wastes such that a Cleanup and Abatement Order under section 13304 is legally justified. Not surprisingly, the Designated Parties disagree about the appropriate cleanup or abatement action needed to restore beneficial uses. Naturally, NASSCO, and to a lesser extent BAE Systems, argue that Monitored Natural Attenuation (MNA) – the least expensive remedy - is the best remedial action to cleanup or abate the condition of pollution or nuisance at the Site.<sup>3</sup> Equally naturally, at the other extreme, Environmental Health Coalition (EHC) and San Diego Coastkeeper (Coastkeeper) argue that a substantially larger and more expensive dredging project is needed to restore beneficial uses. But, the Cleanup Team is the only Designated Party to this proceeding charged with the duty of

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<sup>2</sup> “Nuisance” means anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. Water Code section 13050(m).

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

<sup>3</sup> NASSCO spills considerable ink arguing that section 13304 allows a party to either clean up **or** abate the effects of its wastes, apparently to support its argument that MNA is the appropriate remedy. While the Cleanup Team disagrees that MNA is the appropriate remedy, we note that NASSCO’s argument constitutes an implied admission that beneficial uses at the Shipyard Sediment Site are impaired and that some form of CAO is appropriate. Even Exponent, NASSCO’s and BAE Systems’s retained expert, concludes, based on a series of industry-favorable assumptions about how to interpret site-specific data, that beneficial uses at the Shipyard Sediment Site are 5 percent impaired.

representing the public interest, rather than the specific interests of its shareholders or members, and it is the only Designated Party obligated to adhere to the policies and procedures established by the Legislature, the State Water Board, and the San Diego Water Board.

All of the Designated Parties other than the Cleanup Team have their own partisan interests in this proceeding. Many of their respective arguments supporting different alternative cleanup levels seem reasonable and evidence-supported when viewed in isolation. Under close scrutiny, however, all ultimately fail because they fall short of striking the proper balance for alternative cleanup levels mandated by Resolution No. 92-49. As will be discussed in detail below, only the TCAO:

“Ensures that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of ... the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on these waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible[.]” Resolution No. 92-49, § III G.

The Cleanup Team, having no partisan interest, is uniquely situated to balance the “total values involved, beneficial and detrimental, economic and social, tangible and intangible,” and the alternative cleanup levels proposed in the TCAO achieve the restoration and protection of beneficial uses while striking the appropriate and required balance.<sup>4</sup>

### **The Record Contains Substantial Evidence Supporting The TCAO’s Findings And Alternative Cleanup Levels.**

When adopting a CAO under section 13304, a Regional Water Board may not prejudicially abuse its discretion. *See* Water Code, § 13330(c); Code Civ. Proc., § 1094.5(c). A prejudicial abuse of discretion occurs when the Water Board fails to proceed in the manner required by law, fails to support a CAO with findings, or fails to support those findings with substantial evidence. Code Civ. Proc., § 1094.5(c); *Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 515. Indeed, a respondent agency’s actions are presumed to comply with applicable law. Evid. Code § 664; *Foster v. Civil Service Com. of Los Angeles* (1983) 142 Cal.App.3d 444, 453. As California’s Supreme Court observed, substantial evidence is evidence of “ponderable legal significance,” which is “reasonable in nature, credible and of solid value.” *Ofsevit v. Trustees of California State Universities and Colleges* (1978) 21 Cal.3d 763, 773, n. 9. “Substantial evidence” means facts, reasonable assumptions based on facts and expert opinions supported by facts. *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4<sup>th</sup> 1004, 1019. Importantly, an agency may also rely on the opinion of its staff in reaching decisions, and “the opinion of staff has been recognized as constituting substantial evidence.” *Browning-Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866 *citing* *Coastal Southwest Dev. Corp. v. California Coastal Zone Conservation Com.* (1976) 55 Cal.App.3d 525, 535-536.

Although Water Code section 13330(c) authorizes a court to exercise its own independent judgment on the record evidence when reviewing a Water Board’s decision to adopt a CAO, the

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<sup>4</sup> See Response 31.1 for further discussion on how the alternative cleanup levels balance the total values involved.

Water Board's interpretation of its own regulations and the regulatory scheme which it implements and enforces is entitled to great deference. *See Building Industry Assn.(BIA) v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 985, 998, n. 9; *citing Yamaha Corp. of America v. State Bd. of Equalization* (1998) 19 Cal.4th 1, 7-8. In light of the statutory presumption that an agency's action complies with applicable law, and the judicial direction that an agency's interpretation of its own regulations is entitled to great deference, even when exercising its independent judgment, "a trial court must afford a strong presumption of correctness concerning the administrative findings, and **the party challenging the administrative decision bears the burden of convincing the court that the administrative findings are contrary to the weight of the evidence.**" *BIA, supra*, 124 Cal.App.4th at 998, *emph. added*; *citing Fukuda v. City of Angels* (1999) 20 Cal.4th 805, 817. As explained by California's Supreme Court, even in "independent judgment review" cases, the findings of a board where formal hearings are held come before the courts with a strong presumption in their favor, and considerable weight must be given to the findings of experienced administrative bodies made after a full and formal hearing, especially in cases involving technical and scientific evidence. *Fukuda, supra*, 20 Cal.4th at 812, *citing Drummey v. State Bd. of Funeral Directors* (1939) 13 Cal.2d 75, 84, 86. Certainly, the San Diego Water Board is an experienced administrative body, familiar with the application of its own regulations, and will be deciding this matter involving technical and scientific evidence after a full and formal hearing. Accordingly, any decision made by the San Diego Water Board regarding the TCAO, if appealed, will go before a reviewing court with a "strong presumption of correctness."

All the Designated Parties agree that there must be substantial evidence in the record to support the findings in the TCAO. Not surprisingly, they disagree over whether there is. Some Designated Parties argue there is no substantial evidence in the administrative record to support naming them as "Dischargers" in the TCAO. The specific, detailed substantial evidence to support naming those Designated Parties as Dischargers is detailed in this Response to Comments under the specified findings, and will not be repeated here. *See e.g.*, Finding 5 Star & Crescent Boat Company, Finding 9 SDG&E, Finding 10 U.S. Navy, and Finding 11 Port District. Generally, the DTR sets forth and/or cites substantial evidence in the administrative record to support each finding in the TCAO, and this Response to Comments is formatted in the same manner. The following specifically addresses a group of Comments generally arising under Resolution No. 92-49, including: (1) whether there is substantial evidence in the record to support the TCAO's finding that cleanup to background is not economically or technologically feasible; (2) whether there is substantial evidence in the record to support the TCAO's findings that beneficial uses at the Shipyard Sediment Site are impaired and active remediation is warranted; and (3) whether there is substantial evidence in the record to support the TCAO's findings that the proposed alternative cleanup levels will not unreasonably effect present and anticipated future beneficial uses.

### **The TCAO Is Fully Compliant With State Water Board Resolution No. 92-49 And Furthers Its Policy Objectives.<sup>5</sup>**

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<sup>5</sup> TCAO Findings 29 (background) 30 (technological feasibility), 31 (economic feasibility), 32 (alternative cleanup levels) and 36 (legal and regulatory authority) overlap to a great extent because the concepts are interrelated under Resolution No. 92-49. While fact and evidence-specific technical responses to comments are organized by finding

Under Water Code section 13360, the San Diego Water Board may not specify the particular manner by which dischargers must cleanup or abate the effects of their wastes, and a person subject to an order under Water Code section 13304 may comply with it in any lawful manner. Accordingly, the consistent and longstanding practice of the San Diego Water Board, and indeed of all the Water Boards, has been to require dischargers to propose the method for complying with a CAO and for the Water Boards to review, analyze and concur with the method proposed. This longstanding practice was codified by the State Water Board in 1992, when it adopted its Resolution No. 92-49. *See* Resolution No. 92-49, ¶ 18. Despite the somewhat tortured process in which the Cleanup Team engaged to develop and present TCAO No. R9-2011-0001 to the San Diego Water Board for its consideration and adoption, its development in the form presented to the San Diego Water Board at this time did not substantially vary from the Water Boards' normal process. The TCAO represents an amalgam of concepts and ideas for cleanup and abatement presented by the named dischargers, as a group in mediation, then reviewed, analyzed and recommended by the Cleanup Team for approval by the San Diego Water Board. As a practical matter, given the named dischargers' inability for nearly ten years to agree on an acceptable and sufficiently protective method of cleanup or abatement and propose it for review and approval, the Cleanup Team had no other realistic choice.

To ensure that dischargers have the opportunity to select cost-effective methods for cleaning up and abating their discharges, the San Diego Water Board must concur with any cleanup and abatement proposal which the dischargers have demonstrated has a substantial likelihood of achieving compliance with cleanup goals and objectives *within a reasonable time frame*. Resolution No. 92-49, § III (A). Those cleanup goals and objectives must, in turn, implement applicable Water Quality Control Plans and Policies and implement permanent cleanup and abatement solutions which do not require ongoing maintenance. *Ibid.* The TCAO and supporting DTR contain data and analyses gathered and submitted by the dischargers, and reviewed, analyzed and recommended by the Cleanup Team. There is a considerable body of evidence in the administrative record and DTR to support findings that the alternative cleanup levels proposed in the TCAO have a substantial likelihood of achieving compliance with cleanup goals and objectives within a reasonable time frame.

**Substantial Evidence Supports The TCAO's Findings That The Shipyard Sediment Site Is Impaired And That MNA Cannot Achieve Beneficial Use Protection With A Reasonable Time.**

Relying wholly on the Shipyard Report (Exponent 2003), NASSCO and BAE Systems contend that no substantial evidence in the record supports the finding that the Shipyard Sediment Site is impaired. Specifically, NASSCO and BAE Systems contend that the Cleanup Team's analyses, assumptions and interpretation of the same data Exponent used in its analyses are too conservative and that MNA is a sufficient "abatement" action for the Site. NASSCO's and BAE Systems's criticisms are inapt. First, Exponent's MNA proposal implicitly acknowledges there is at least some beneficial use impairment. Otherwise there would be no need to monitor the site

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number in the TCAO, this responds to claims by various Designated Parties that the TCAO does not legally comply with Resolution No. 92-49.



to ensure that constituents of concern (COCs) diminish to levels that will be sufficiently protective of beneficial uses over time, a need the Shipyard Report (Exponent, 2003) acknowledges.

Second, the Shipyard Report (Exponent, 2003) is a wholly risk-based analysis that is fashioned in the style of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-based cleanup. CERCLA actions involve the imposition of “strict liability” and, as a tradeoff for imposing strict liability, Congress determined that CERCLA cleanups can and should leave behind as much residual contamination as can be tolerated. CERCLA cleanups are driven primarily by cost considerations, and a “CERCLA-quality cleanup” is defined to be one that is the cheapest possible within acceptable risk parameters. A CERCLA quality cleanup must be cost effective. *County Line Inv. Co. v. Tinney* (10<sup>th</sup> Circuit 1991), 933 F.3d 1508, 1514, *citing* 40 C.F.R. § 300.430(f)(1)(ii)(D). U.S. EPA guidance on CERCLA remedies states: “Cost is a critical factor in the process of identifying a preferred remedy. In fact, CERCLA and the NCP require that every remedy selected must be cost-effective” (U.S. EPA, 1996, p.5). “CERCLA tempers its emphasis on permanent solutions and treatment through the addition of the qualifier “to the maximum extent practicable,” and also contains the co-equal mandate for remedies to be cost-effective.” *Id.*, at p. 2.

Porter-Cologne’s purpose and remedy selection process is different than CERCLA’s. While Resolution No. 92-49 directs that costs of cleanup be considered in an economic feasibility context, cost is not one of the driving factors for determining appropriate cleanup levels under Porter-Cologne. The duty to ensure restoration and enhancement of beneficial uses under Porter-Cologne *demand*s that the San Diego Water Board make more conservative assumptions about exposure, consumption, and risk than would be appropriate under CERCLA’s cost-driven scheme. Put simply, a “CERLCA-quality cleanup,” or solely risk-based analysis, which is essentially what Exponent (2003) advocates in its MNA recommendation, leaves beneficial uses at risk for an indefinite period of time. In developing the various findings concerning the impairment of beneficial uses at the Shipyard Sediment Site, the Cleanup Team, which has considerable expertise and experience with the implementation of Porter-Cologne and Resolution No. 92-49, based its determinations that the Site is impaired and that MNA is not capable of achieving beneficial use protection within a reasonable amount of time on the same data Exponent (2003) used, and on reasonably conservative assumptions designed to ensure that present and anticipated future beneficial uses will be protected within a reasonable time frame.

Finally, NASSCO’s and BAE System’s argument that MNA is an appropriate abatement action because beneficial uses at the Site are only marginally impaired falsely assumes that there is no need to protect beneficial uses today because the Site is “secured.” They argue that by the time their leases run out the Site will have equilibrated to background sediment chemistry levels. Even if this were true, it would be an abuse of discretion to defer the restoration of beneficial uses in these waters while NASSCO and BAE Systems maintain conditions of pollution or nuisance there for years to come. NASSCO and BAE Systems do not own the waters of the state even if those waters happen to be currently surrounded by security booms. Moreover, Resolution No. 92-49 requires cleanup **or** abatement actions to achieve compliance with cleanup goals and objectives that implement applicable water quality control plans **within a reasonable time frame**. Resolution No. 92-49, § III (A). Allowing beneficial uses at the Site to remain

impaired for years is inconsistent with the cleanup goals and objectives for the Shipyard Sediment Site, could in no way be considered “implementing” the San Diego Region’s Basin Plan and is simply not a way to achieve cleanup goals and objectives within a reasonable time frame. The entire San Diego Bay is listed on the Clean Water Act section 303(d) list as impaired for PCBs based on fish tissue data. As such, Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Wildlife Habitat (WILD) and Shellfish Harvesting (SHELL) beneficial uses continue to be impaired. Implementing a cleanup at the Shipyard Sediment Site is just one of the many steps that will need to be taken in the process of restoring “fishable” beneficial uses to San Diego Bay, and it cannot be delayed.

Thus, as described in detail in the Responses to Comments for Findings 18, 24, 28, and 32, the Cleanup Team properly made conservative assumptions in its analysis of whether beneficial uses at the Shipyard Sediment Site are impaired to help ensure that the highest water quality which is reasonable is attained within a reasonable time frame, and that beneficial uses are protected. *See* Water Code section 13000. Indeed, the Cleanup Team and the San Diego Water Board must make these types of conservative assumptions to fulfill their statutory obligations.

**Substantial Evidence Supports The TCAO’s Finding That Cleanup To Background Is Not Technologically And Economically Feasible.**

Under Resolution No. 92-49, a Water Board must require dischargers to cleanup and abate the effects of their wastes in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored. *Id.*, at § III (G). All of the Designated Parties agree with this interpretation of Resolution No. 92-49. *See e.g.*, Exponent NASSCO and Southwest Marine Detailed Sediment Investigation 2003, Appendix P, at p. P-7 [“Under Resolution No. 92-49, the RWQCB is mandated to require a presumptive cleanup goal of background water quality.”].<sup>6</sup>

Resolution No. 92-49 also provides direction regarding how Water Boards are to determine whether the presumptive cleanup to background water quality will be required, or whether some alternative cleanup level that results in “the best water quality which is reasonable” should be adopted. The first step for determining an appropriate site cleanup level is to determine whether or not it is economically and technologically feasible to cleanup wastes to background levels. Resolution No. 92-49, §§ III (H)(1)(a), (b). Technological feasibility is determined by assessing available technologies that have been demonstrated to effectively reduce concentrations of waste under similar hydrogeologic conditions. Resolution No. 92-49, § III (H)(1)(a). Some polygons were recommended for exclusion from the remedial footprint because, for example, physical conditions such as their steep slopes and/or proximity to bulkheads or structures make available technologies infeasible to deploy. Economic feasibility is “an objective balancing of the

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<sup>6</sup> Even NASSCO’s arguments that MNA is the appropriate remedy and that there is no legal authority to order a cleanup where abatement is sufficiently protective of beneficial uses admit that cleanup to background is the presumptive cleanup goal. NASSCO’s arguments depend on the assumption that MNA can achieve protection of beneficial uses within a reasonable time frame and that, as a result, cleanup to background is not economically feasible because the incremental cost above MNA for achieving protection of beneficial uses does not result in any incremental benefit. The Cleanup Team disagrees that MNA is capable of achieving protection of beneficial uses within a reasonable time, as detailed in its responses to specific comments.

incremental benefit of attaining further reductions in the concentrations of COCs as compared with the incremental cost of achieving those reductions.” *Id.*, at § III (H)(1)(b). As detailed in the Cleanup Team’s Response 31.1, the TCAO’s proposed alternative cleanup levels require active remediation by dredging of sediments to a point where the incremental costs of further dredging outweigh the incremental environmental benefits. Under the Cleanup Team’s analysis, the alternative cleanup levels result in concentrations of COCs that do not unreasonably impact beneficial uses.

If background cleanup levels are economically and technologically feasible, then dischargers must cleanup to background. If it is either technologically or economically infeasible to cleanup to background, then a Water Board is authorized to order alternative cleanup levels above background so long as certain other conditions are met. *See* Resolution No. 92-49, §§ III (G)(1)-(3).

SDG&E, EHC and Coastkeeper argue that the record contains no substantial evidence to support Findings 30 and 31 that cleanup to background is not technologically or economically feasible.<sup>7</sup> The Port District, NASSCO, BAE Systems and the City of San Diego argue that it does. The Designated Parties’ arguments differ only with respect to how they chose to interpret the same data.<sup>8</sup> The Cleanup Team’s interpretation of the data, and the substantial evidence that supports its conclusions that cleanup to background is not technologically or economically feasible, are set forth in its responses to comments under Findings 30 and 31. As noted above, the San Diego Water Board is granted considerable discretion regarding how to apply the requirements of Resolution No. 92-49 to the specific facts and evidence available to it. Resolution No. 92-49 does not require, as Coastkeeper and EHC argue, that the San Diego Water Board engage in its economic and/or technological feasibility analyses on a “constituent by constituent” basis, by grouping polygons in a specific way, or in any other particular manner. In fact, even EHC’s and Coastkeeper’s own economic feasibility analysis supports a determination that it is not economically feasible to remediate the Shipyard Sediment Site to background since that analysis concludes that incremental costs outweigh incremental benefits after an addition of 8 polygons to the TCAO’s proposed cleanup footprint, and would leave COCs behind at above-background levels.<sup>9</sup> In essence, all that is required is that the Cleanup Team’s analyses be reasonable and supported by substantial evidence, which they are.

### **Substantial Evidence Supports The TCAO’s Finding That The Proposed Alternative Cleanup Levels Are Reasonably Protective Of Beneficial Uses.**

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<sup>7</sup> SDG&E argues that the entire analysis in the DTR based on site-specific data should be scrapped, and that toxic unit values derived from textbooks without the benefit of site specific toxicity and benthic community analyses should be used to replace it. The argument is one specifically contrived to minimize SDG&E’s potential share of responsibility, and is addressed by the Cleanup Team in its Responses to Comments on Findings 18 and 32.

<sup>8</sup> In fact, all of the commentors base their respective claims and arguments on the same set of data, primarily gathered by Exponent in 2001 and 2002. It is only the interpretation of that data that differs.

<sup>9</sup> Because their economic feasibility analysis results in an addition of only 8 polygons to the proposed remedial footprint and would leave COCs in the sediments at above-background levels, EHC’s and Coastkeeper’s argument that no substantial evidence supports the determination that cleanup to background is not economically feasible is, in essence, an argument that the alternative cleanup levels should be lower than those proposed in the TCAO – not an argument that cleanup to background is feasible.

When determining an appropriate alternative cleanup level, a Water Board is to consider “all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Resolution No. 92-49, § III (G). If, after having taken the listed factors into consideration, a Water Board determines it is appropriate to adopt a cleanup level less stringent than background, it must make evidence-supported findings that the alternative cleanup levels: (1) are consistent with maximum benefit to the people of the state; (2) do not unreasonably affect present and anticipated beneficial uses of effected waters; and (3) do not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards. *Id.*, at subs. (1)-(3). Thus, Resolution No. 92-49 gives Water Boards broad discretion to adopt a CAO that imposes cleanup levels that balance the “total values” involved in any given situation so long as those cleanup levels meet the listed conditions.

SDG&E,<sup>10</sup> EHC, and Coastkeeper disagree with NASSCO and BAE Systems, and agree with the Cleanup Team’s analysis that substantial record evidence establishes that the Shipyard Sediment Site’s beneficial uses are impaired. But, each claims that no substantial evidence in the record supports the finding that the TCAO’s alternative cleanup levels will sufficiently protect beneficial uses.<sup>11</sup> NASSCO and BAE Systems argue that the TCAO’s alternative cleanup levels are supported by substantial record evidence and that, with the conservative assumptions made by the Cleanup Team, beneficial uses will not be unreasonably affected. All of the Designated Parties are using the same data, but their respective analyses vary based on their respective partisan viewpoints and interests. The DTR contains a sophisticated analysis of the alternative cleanup levels capabilities for protecting beneficial uses based on reasonably conservative assumptions. The Cleanup Team’s analysis is based on site-specific chemistry, toxicity, and benthic community data. The TCAO also incorporates a “failsafe” post-remedial monitoring program that ensures that the cleanup levels deployed to protect beneficial uses will be achieved and maintained. While all the other Designated Parties’ positions are at least somewhat plausible based on the available data, only the Cleanup Team’s alternative cleanup levels proposed in the TCAO appropriately balance “all demands being made and to be made on these waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Resolution No. 92-49, § III (G). The San Diego Water Board is charged with striking the appropriate balance. In essence, the question of how best to weigh the various factors that go into balancing “all demands being made on these waters” and “the total values involved” is one of policy, and the Board has broad discretion to fashion an appropriate answer.

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<sup>10</sup> See footnote 6, *supra*.

<sup>11</sup> The Port contends that two polygons on the northern edge of the Shipyard Sediment Site should be added to the remedial footprint in order to achieve reasonable beneficial use protection. A portion of those two polygons is contained within the remedial footprint, and the remaining area is currently targeted for an investigative order. The purpose of that investigative order will be to determine whether beneficial uses in that area and areas to the north of it are impaired, whether a CAO should be issued if it is, and whether there are potentially responsible parties not present in this proceeding that should be named as dischargers. Further specific responses to the Port’s argument are set forth in Responses to Comments on Finding 32.

**The TCAO Correctly Applies Applicable Provisions Of Title 23, Chapter 15 Of The California Code Of Regulations; Resolution No. 92-49 Does Not Require Alternative Cleanup Levels To Be Established For Every Constituent Of Concern.**

EHC and Coastkeeper argue that the San Diego Water Board must establish an alternative cleanup level for each and every COCs identified at the Shipyard Sediment Site.<sup>12</sup> The argument is based on their reading of the following statement in Resolution No. 92-49:

The Regional Water Board shall: ...In approving any alternative cleanup levels less stringent than background, apply section 2550.4 of Chapter 15 [of Title 23 of the Cal. Code of Regs.][.]” Resolution No. 92-49, § III (G).

EHC and Coastkeeper then cite section 2550.4(c), which is a part of Chapter 15 of Title 23, in support of their arguments that (1) economic feasibility must be analyzed on a COC-by-COC basis; and (2) if cleanup to background is economically feasible, an alternative cleanup level must be established for each and every COC. This novel argument fails for several reasons.

When applying a statute or regulation, an administrative body must endeavor to give meaning to every section, and harmonize the meanings of those sections so as to not achieve an absurd result. *California Mfrs. Assn. v. Public Utilities Com.* (1979) 24 Cal.3d 836, 844; *Moyer v. Workmen’s Comp. Appeals Bd.* (1973) 10 Cal.3d 836, 844 [A construction making some words surplusage is to be avoided. The words of the statute must be construed in context, keeping in mind the statutory purpose, and statutes or statutory sections relating to the same subject must be harmonized, both internally and with each other, to the extent possible.]. First, EHC’s and Coastkeeper’s argument fails to consider the section of Resolution No. 92-49 immediately preceding III (G) wherein the regional boards are directed to implement the provisions of Chapter 15 that are applicable to a particular cleanup. Resolution No. 92-49, § III (F)(2). Chapter 15 is to be applied “if the cleanup and abatement involves corrective action at a waste management unit regulated by waste discharger requirements issued under Chapter 15[.]” or “if cleanup and abatement involves removal of waste from the immediate place of release and discharge of the waste to land for treatment storage or disposal[.]” Resolution No. 92-49, §§ III (F)(2)(a), (b). In fact, the entirety of Chapter 15 addresses regulation of, including cleanup and abatement actions at, facilities that treat, store, or dispose of hazardous waste at Class I waste management units. Since the Shipyard Sediment Site is not a Class I waste management unit, it follows that not all of the provisions of Chapter 15, are likely to be “applicable” to a cleanup and abatement action at the Site. In short, read as a whole, Resolution No. 92-49 simply requires that Water Boards apply section 2550.4 to the extent it is applicable, or makes sense.

Second, section 2511 clearly states that cleanup or abatement actions are exempt from the provisions of Chapter 15 of Title 23, including section 2550.4(c), and that Regional Water Boards “shall implement applicable provisions of this chapter to the extent feasible.” 23 Cal. Code Regs. § 2511(d). Here, the Cleanup Team applied section 2550.4 to the extent it can be

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<sup>12</sup> Both NASSCO and BAE Systems undertake a detailed analysis of Chapter 15 of Title 23 of the California Code of Regulations and, looking at the Chapter as a whole, make a persuasive argument that EHC’s and Coastkeeper’s argument for constituent by constituent cleanup levels fails. The Cleanup Team incorporates those arguments in this response as if set forth in full.

applied without achieving an absurd result. *See* DTR Findings 32-33. The TCAO proposes numeric alternative cleanup levels for the five “primary” COCs – high molecular weight polynuclear aromatic hydrocarbons (HPAHs), tributyltin (TBT), mercury, copper and polychlorinated biphenyls (PCBs). Because secondary COCs are co-located with primary COCs, post-remedial Surface-Area Weighted Average Concentration (SWACs) for the secondary COCs end up being protective of beneficial uses so long as the TCAO’s proposed alternative cleanup levels for the primary COCs are attained. In essence, the TCAO is a cleanup and abatement action designed to address polluted *sediments* and restore them to a quality where they no longer impair beneficial uses of the waters of San Diego Bay. The strict application of section 2550.4(c) urged by EHC and Coastkeeper ignores the context within which this action is being taken, which is not a cleanup and abatement action at a Class I waste management facility.

The distinction between the cleanup of a marine sediment site and the cleanup of groundwater at a Class I waste management facility is further illustrated by the DTR’s analysis of aquatic life beneficial uses. Toxicity tests under one of the legs of the triad analysis undertaken to determine site impairment and alternative cleanup levels sufficiently protective for aquatic wildlife beneficial uses measure toxicity for total COC mixtures in marine sediment. The TCAO proposes alternative cleanup levels that achieve beneficial use protection for aquatic wildlife based on total sediment quality conditions. It makes little sense to establish alternative cleanup levels on a COC-by-COC basis for aquatic wildlife beneficial use protection.

Moreover, as NASSCO and BAE Systems point out, setting individual cleanup levels for each COC, then applying them on a polygon-by-polygon basis, as EHC and Coastkeeper urge, would likely result in cleanup to below background levels for some COCs. Of course, aspects of Resolution No. 92-49 that specifically address the application of Chapter 15 prohibit the water boards from interpreting the Resolution in a way that results in “water quality conditions that are better than background conditions.” Resolution No. 92-49, § III (F)(1). Accepting EHC’s and Coastkeeper’s arguments for a COC-by-COC alternative cleanup level and economic feasibility analysis would read section III (F)(1) out of the Resolution and lead to an absurd result.

For these reasons, no other CAO requiring sediment remediation in San Diego Bay has ever undertaken a COC-by-COC analysis of economic feasibility, or set alternative cleanup levels for each and every COC.

In short, the Cleanup Team considered and applied section 2550.4 to the extent it can be applied to the Shipyard Sediment Site consistent with its obligation to give meaning to and harmonize every section of Resolution No. 92-49.

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## RESPONSE 1.2

**DTR Section:** 1, 32, 36

**Comment Submitted By:** NASSCO

**Comment ID:** 155

**Comment**

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The TCAO results in the disparate treatment of NASSCO, contrary to law. in violation of the mandate of Resolution 92-49, and principles of due process and equal protection, the order would treat NASSCO differently than similarly situated dischargers (Findings 2, 6, 32, 36).

Resolution 92-49 provides that the “Regional Water Board shall . . . prescribe cleanup levels which are consistent with appropriate levels set by the Regional Water Board for analogous discharges that involve similar wastes, site characteristics, and water quality considerations.” See also Barker Depo, at 345:12-345:17 (recognizing that a goal of Resolution 92-49 is to ensure that Regional Boards treat similar sites similarly). Principles of due process and equal protection also require both fundamental fairness, and that persons subject to legislation or regulation who are in the same circumstances be treated alike. U.S. Const. amend. XIV, §1; Cal. Const. art. I, §§ 7, 15.

Over the past decade, the Regional Board has prescribed cleanup levels for sediments at other shipyard and boatyard locations on San Diego Bay with analogous discharges involving similar circumstances as the Site. See e.g., San Diego Regional Board Order Nos. 88-86, 88-78, 89-31, 84-100, 94-101, 94-102, 95-21, 97-63, 99-06, 2001-303, R9-2002-0072. Barker Depo, Ex. 1210 at Exhibit A. However, despite substantial similarities between these sites and NASSCO, the Regional Board now seeks to impose radically more stringent cleanup levels upon NASSCO in departure from prior precedent and in violation of both due process and equal protection principles, and the consistency requirement expressly stated in Resolution 92-49. TCAO, at ¶ 32, DTR, at 32-1.

#### 1. The Proposed Cleanup Levels Are Unprecedented Compared To Other Sediment Remediation Projects In San Diego Bay (Findings 32, 36)

Although similar sites are required to be treated similarly, Staff has proposed unprecedented cleanup levels for the Site, while setting much less stringent levels at other similarly situated sites. Response to NASSCO’s RFAs, at 56. [Comment No. 17, TCAO, at 32, 36, DTR, at 32, 36.4]. Since the early 1990s, the Regional Board has remediated sediments at a number of shipyards, boatyards and other industrial sites in San Diego Bay. Many of these sites, including the Commercial Basin Boatyards, Paco Terminals, Convair Lagoon, and Campbell Shipyard, are similar to NASSCO in many respects, including but not limited to geographical location, water quality considerations, uses, wastes, beneficial uses, and receptors of concern. Barker Depo, at 118:14 – 140:1; 346:25 – 352:15; 354:22 – 361:18; 385:17 – 387:4, 564:25 – 565:23, 567:7 – 567:16; see also Barker Depo, Ex. 1210 at Exhibit A. [Comment No. 18, TCAO, at 32, 36, DTR, at 32, 36.4]. In particular, Campbell and NASSCO have similar physical, biological and chemical conditions, locations, site activities, waste materials and matrices, offsite pollutant inputs, and hydrodynamic and biogeographic zones. Barker Depo, at 362:15 – 365:5. Yet, in spite of these similarities, the cleanup levels proposed for NASSCO are far more stringent than those of the other sites, including Campbell Shipyard, for the same constituents. See e.g., Barker Depo, 365:8 – 365:23.

For example, at Paco Terminals, Campbell Shipyard, and the Commercial Basin Boatyards requiring cleanup, the copper cleanup levels were 1000 mg/kg, 810 mg/kg, and 530mg/kg, respectively. Thus the copper cleanup levels for all of these sites are well above the post-

remedial Surface-Area Weighted Average Concentration (“SWAC”) (159 mg/kg) and dredge concentrations (121 mg/kg) proposed for NASSCO. Similarly, the mercury cleanup levels set for the Commercial Basin boatyards that required remediation were 4.8 mg/kg, which is once again almost ten times above the post-remedial SWAC (0.68) and dredge concentration (0.57) proposed for NASSCO. Cleanup levels for primary risk drivers, such as PCBs and TBT, are also significantly more stringent at NASSCO compared with Campbell. Barker Depo, Ex. 1210 at Exhibit A.

To reach these low cleanup levels, Staff has introduced excessive levels of conservatism in its analysis. For example, Staff calculated cleanup levels for Campbell using an apparent effects approach; however, at NASSCO, Staff used the lowest apparent effects threshold, and then introduced a 40% safety buffer to further reduce the cleanup level, resulting in exceptionally low cleanup levels compared to other sites in the bay. Barker Depo, 373:14 – 374:22. Moreover, cleanup levels at NASSCO are also more stringent than similar sites elsewhere in the nation. Barker Depo, at 944:18 – 947:11, 47:16 – 949:21.

### **Response 1.2**

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NASSCO's equal protection argument lacks merit. The last sediment cleanup ordered by the San Diego Water Board was over 15 years ago in 1995. As evidenced by the DTR, the advances in data collection, analytical techniques and analytical tools since that time are substantial. Resolution No. 92-49 does not mandate the Regional Water Boards remain stuck in time, nor that they cannot use, *inter alia*, scientific advances with respect to understanding beneficial use impairment, with respect to emerging remediation technologies, and with respect to analyzing the effectiveness of alternative cleanup levels greater than background. Resolution No. 92-49 merely provides that the regional boards are to prescribe cleanup levels which are consistent with analogous discharges that involve similar wastes, site characteristics and water quality considerations, not that alternative cleanup levels must be identical for all cleanups. (Section II (A)(9).) To be consistent, cleanups need not be identical - as NASSCO argues. In all the sediment remediations discussed by NASSCO, including the Shipyard Sediment Site project, the San Diego Water Board acted consistently. It looked at site specific data, it undertook economic and technological feasibility analyses and it set alternative cleanup levels based on the results of its analyses.

Moreover, each sediment site within San Diego Bay is unique and has its own particular characteristics with respect to COCs, total organic carbons, sediment fines and grain size, physical constraints, tides, and many other important variables. For example, the Shipyard Sediment Site is unique from even the Campbell Shipyard Site in that shipyards are not the only contributors to the condition of pollution or nuisance, but, rather, COCs were contributed to the Shipyard Sediment Site by urban runoff and by a major power plant. Critically, the alternative cleanup level proposed is tailored to address nine different COCs at the Shipyard Sediment Site, and relies on site-specific chemistry, toxicity, and benthic community data. These specific data serve to distinguish the Shipyard Sediment Site from the other sediment cleanups discussed by the Commentor. Resolution No. 92-49 expressly recognizes and allows for these types of distinctions.



Finally, NASSCO's argument would elevate Resolution No. 92-49 section II (A)(9) above the other important provisions of Resolution No. 92-49, such as section III (G), which essentially mandates that regional boards may not approve alternative cleanup levels greater than background unless beneficial uses will not be unreasonably impacted. NASSCO's argument, in essence, reads section III (G) out of the Resolution, which is legally impermissible. In fact, only the TCAO appropriately addresses all of the various aspects of Resolution No. 92-49 harmoniously and consistently. As detailed in the TCAO and DTR, the alternative cleanup levels for the Shipyard Sediment Site are entirely appropriate based on the site-specific data, and the Cleanup Team has good reason and a rational basis for treating the cleanup there different from Campbell Shipyard, Paco Terminals, or any of the other sediment remediation projects discussed by NASSCO.

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### **RESPONSE 1.3**

**DTR Section:** 1, 36

**Comment Submitted By:** BAE Systems

**Comment ID:** 207

#### **Comment**

Responses to MacDonald's Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34). Conclusion D.3.5 that "The Natural Resource Trustees may conduct a natural resource damage assessment to evaluate injuries to natural resources" is Inappropriate and Unsupported.

MacDonald lacks the qualification to render any opinions regarding what the Natural Resource Trustees may or may not do, and, therefore, his conclusion is inappropriate.

#### **Response 1.3**

Whether or not Mr. MacDonald is qualified to render opinions about "natural resource damage assessments" and those opinions themselves are irrelevant to the current proceedings since the TCAO and DTR do not undertake a natural resource damages assessment. (Also See Response 1.4)

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### **RESPONSE 1.4**

**DTR Section:** 1, 32, 36

**Comment Submitted By:** NASSCO

**Comment ID:** 367

#### **Comment**

EHC/Coastkeeper Comment No. 80: The Order incorrectly concludes that "clean-up of the remedial footprint will restore any injury, destruction, or loss of natural resources." The San Diego Regional Board does not have authority to conduct natural resource damage assessments because only the Natural Resources Trustees have authority to conduct natural resource damage assessments and to draw conclusions regarding injury to natural resources and the effectiveness of remedial actions in terms of restoring natural resource values.

The Regional Board is empowered to “coordinate with the state board and other regional boards, as well as other state agencies with responsibility for water quality, with respect to water quality control matters, including the prevention and abatement of water pollution and nuisance.” Cal. Wat. Code § 13225(a). Additionally, as EHC/Coastkeeper has pointed out, under Resolution 92-49, the Regional Board must ensure that constituents at concentrations below the alternative cleanup levels “will not pose a substantial present or potential hazard to human health or the environment,” and must also weigh factors including “the current and potential uses of surface waters in the area” and “the potential damage to wildlife [and] vegetation . . . caused by exposure to waste constituents.”

The Regional Board has extensively evaluated many of the types of effects that could constitute injury to natural resources at the Site, including exceedances of sediment quality guidelines, sediment toxicity, bioaccumulation, fish histopathology, and risks to wildlife from contaminated prey. Moreover, many of these analyses were developed cooperatively with input from designated Natural Resource Trustees, including U.S. Fish and Wildlife Service, California Department of Game, and the National Oceanographic and Atmospheric Administration. The Regional Board’s statement simply articulates that the cleanup of the remedial footprint at the Site will improve environmental conditions such that natural resources, including those evaluated in detail in connection with the Site investigation and cleanup (i.e., benthic macroinvertebrates, fish, and aquatic-dependent wildlife) will benefit from cleanup. Accordingly, it is appropriate and reasonable for the Regional Board to consider whether the cleanup will be protective of natural resources, including whether it will restore any injury, destruction, or loss of natural resources.

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#### **Response 1.4**

The TCAO and the DTR discuss the general concept of restoration of natural resources in the context of the San Diego Water Board's duty under Resolution No. 92-49 to ensure that any alternative cleanup levels above background must not unreasonably impact, and must reasonably protect, beneficial uses. The Cleanup Team expresses no opinion with regard to EHC's and Coastkeeper's statement that the San Diego Water Board lacks the authority to "conduct natural resource damage assessments" since the TCAO and DTR do not undertake a natural resource damage assessment in this case.

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#### **RESPONSE 1.5**

##### **DTR Section: 1**

**Comments Submitted By:** NASSCO, BAE Systems

**Comment IDs:** 390, 391, 392, 393, 450

##### **Comment**

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ID 390, 391, 392, 393

The Port District submitted a Declaration of Expert Dr. Michael Johns in support of the Port District's comments, evidence, and legal argument. NASSCO commented that Dr. John's Declaration constitutes untimely expert evidence that should have been submitted to the record on or before March 11, 2011. Accordingly, it must be excluded from the record. Furthermore, even if Dr. John’s Declaration is accepted into the record, his conclusions should be given no

weight for the reasons set forth in NASSCO's Comment Nos. 380-384, Replying to Port Comment Nos. 17 - 21.

ID 450

Similarly, BAE Systems commented that the Port District's expert declarations were untimely and impermissible. As set forth in BAE Systems' concurrently filed Motion to Exclude Declarations of the Port District's Experts Michael Johns, Ph.D., Ying Poon, D.SC., and Robert Collacott, MBA M.S., the Regional Board should exclude and strike those untimely and impermissible expert opinion, and should disregard those portions of the Port District's May 26, 2011 comments that rely upon and discuss that expert opinion. In the event the Regional Board declines to grant BAE Systems' motion to exclude, BAE Systems joins in NASSCO's Reply to Comments by the San Diego Unified Port District filed on June 23, 2011 with respect to the substance of those three expert declarations.

### **Response 1.5**

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The Cleanup Team takes no position with respect to NASSCO's and BAE Systems' motions to exclude the expert declarations submitted by the Port District.

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## **2. TCAO Finding 2 and DTR Section 2: National Steel and Shipbuilding Company (NASSCO), A Subsidiary of General Dynamics Company**

Finding 2 of TCAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but NASSCO denies, that NASSCO has caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH).

NASSCO, a subsidiary of General Dynamics Company, owns and operates a full service ship construction, modification, repair, and maintenance facility on 126 acres of tidelands property leased from the Port District on the eastern waterfront of central San Diego Bay at 2798 Harbor Drive in San Diego. Shipyard operations have been conducted at this site by NASSCO over San Diego Bay waters or very close to the waterfront since at least 1960. Shipyard facilities operated by NASSCO over the years at the Site have included concrete platens used for steel fabrication, a graving dock, shipbuilding ways, and berths on piers or land to accommodate the berthing of ships. An assortment of waste is generated at the facility including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations NASSCO is referred to as “Discharger(s)” in this Cleanup and Abatement Order (CAO).

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The San Diego Water Board did not receive any comments regarding Finding 2 and DTR Section 2.

### **3. TCAO Finding 3 and DTR Section 3: BAE Systems San Diego Ship Repair Inc., Formerly Southwest Marine, Inc. (Southwest Marine)**

Finding 3 of TCAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but BAE Systems denies, that BAE Systems caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

From 1979 to the present, Southwest Marine, Inc. and its successor BAE Systems have owned and operated a ship repair, alteration, and overhaul facility on approximately 39.6 acres of tidelands property on the eastern waterfront of central San Diego Bay. The facility, currently referred to as BAE Systems San Diego Ship Repair, is located on land leased from the Port District at 2205 East Belt Street, foot of Sampson Street in San Diego, San Diego County, California. Shipyard facilities operated by BAE Systems over the years have included concrete platens used for steel fabrication, two floating dry docks, five piers, and two marine railways. An assortment of waste has been generated at the facility including spent abrasive, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations BAE Systems is referred to as “Discharger(s)” in this CAO.

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The San Diego Water Board did not receive any comments regarding Finding 3 or DTR Section 3.

#### **4. TCAO Finding 4 and DTR Section 4: City of San Diego**

Finding 4 of TCAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but the City of San Diego denies, that the City of San Diego caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. From the early 1900s through February 1963, when the relevant tideland areas were transferred from the City of San Diego to the Port District, the City was the trustee of and leased to various operators, all relevant portions of the Shipyard Sediment Site. The wastes the City of San Diego caused or permitted to be discharged, or to be deposited where they were discharged into San Diego Bay through its ownership of the Shipyard Sediment Site contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

The City of San Diego also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit. The San Diego Water Board alleges, but the City of San Diego denies, that the City of San Diego has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes.

The San Diego Water Board alleges, but the City of San Diego denies that the City of San Diego has also discharged urban storm water containing waste through its MS4 to Chollas Creek resulting in the exceedances of chronic and acute California Toxics Rule copper, lead, and zinc criteria for the protection of aquatic life. Studies indicate that during storm events, storm water plumes toxic to marine life emanate from Chollas Creek up to 1.2 kilometers into San Diego Bay, and contribute to pollutant levels at the Shipyard Sediment Site. The urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay. Based on these considerations the City of San Diego is referred to as “Discharger(s)” in this CAO.

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#### **RESPONSE 4.1**

**DTR Sections:** 4.7.1.3, 12, 30, 32, 33

**Comments Submitted By:** NASSCO, Port District, City of San Diego

**Comment IDs:** 32, 187, 284, 394, 475, 476

#### **Comment**

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NASSCO expressed concern that, contrary to the conclusion in Finding 30 of the TCAO, it is neither technically feasible, nor prudent, to carry out the proposed cleanup while uncontrolled sources of pollution continue to impact the Site. Chollas Creek has been recognized as

contributing to the accumulation of pollutants observed in marine sediments at the Site, and sources of pollution from Chollas Creek are not fully controlled. If source control of Chollas Creek is not achieved before the cleanup is conducted, pollutants from Chollas Creek “could influence contaminant levels in sediment” and possibly cause the Site to become recontaminated. Barker Depo, 172:4 – 174:11.

Chollas Creek is immediately adjacent to the NASSCO shipyard and discharges contaminated storm water at extraordinarily high volumes during rain events, along with dry weather run-off. The plume of contaminated water from Chollas Creek during rain events has been shown to extend more than a kilometer from the discharge point including the area within NASSCO’s leasehold, and contributes an array of pollutants to the Site.

In rebuttal, the City of San Diego reiterated its comments that Chollas Creek is not a significant source of Shipyard Sediment Site COCs. See Response 4.2 below for responses to the City's comments on Chollas Creek contributions.

NASSCO commented that the storm water contains PCBs, pyrogenic hydrocarbons, oil and grease, synthetic organics, and heavy metals, among other pollutants, with estimated average annual pollutant loads of 429 kg copper, 301 kg lead, 2906 kg zinc, 2.7 kg PAH, 20g chlordane, 0.4g PCBs, 850 g arsenic, and 80g mercury.

In rebuttal the City of San Diego commented that PCBs have never been detected in Chollas Creek water and that PCBs found in the Chollas Creek mouth or Shipyard sediments are likely from sources other than Chollas Creek.

NASSCO commented that stations NA20 and NA22 – which are not associated with shipyard-related chemicals, but are within the area of apparent sediment deposition from the Chollas Creek stormwater plume – are the only stations in the NASSCO leasehold with apparent benthic effects under the DTR analysis.

In rebuttal, the City of San Diego commented that stations NA20 and NA22 are located next to the piers where full thrust engine testing takes place, resulting in significant physical disturbance to the underlying sediments. U.S. Navy collected bathymetry data shows sediment elevation contours in this area suggesting of significant “blow-out” of sediments, likely from propeller activity during engine testing. The physical disturbance may be the factor affecting the benthic community. In fact, levels of chemicals of concern throughout the shipyard sediment site do not correlate with observed benthic community effects. However, at the only locations where significant physical disturbances take place routinely, benthic community effects are observed.

NASSCO commented that Chollas Creek has also been identified as a significant, if not exclusive, source of pesticides in the sediment at the leaseholds. (Exponent Report, at Section 19-1, Figures 4-18, 4-20). NASSCO commented that correlations are observed between pesticide concentrations and sediment toxicity and that there is clear evidence that pesticides – which are not shipyard-associated chemicals – may be responsible for adverse biological effects observed at the shipyards, particularly adverse effects to bivalves. Storm water containing similar pollutants also drains into the leaseholds both directly and indirectly, from a number of

sources, including adjacent city streets, and large city storm drains. These discharges are associated with observed effects at the Site, and active remediation is therefore inappropriate unless and until these discharges are completely controlled.

In rebuttal, the City of San Diego commented that NASSCO's argument above is based on only four sample results which do not provide sufficient statistical power to conclude that there is or is not a correlation.

NASSCO further commented that the TCAO has proposed extensive dredging to unprecedented cleanup levels, at a cost of millions of dollars, despite the fact that ongoing uncontrolled discharges from Chollas Creek are impacting the Site, and are not expected to be controlled for at least 20 years. It is axiomatic that source control must be achieved prior to active remediation and common sense dictates that is a waste of resources to spend millions to remediate a site that is at risk of recontamination. It is also not technologically feasible to require compliance with the exceptionally stringent cleanup levels proposed in the TCAO while the Site continues to be impacted by uncontrolled discharges from Chollas Creek. Accordingly, Chollas Creek and other sources unrelated to NASSCO must be controlled before the cleanup goals in the TCAO can be achieved through active remediation. Ideally, source control should be achieved prior to active remediation because "the long-term effectiveness of any remedial option can be reduced if sediment transport acts to recontaminate the site.

In rebuttal the City of San Diego commented that it is committed to complying with the Chollas Creek metals TMDL. While actions are not required prior to 2018, 80% reduction is required by 2018. The City has analyzed and evaluated different means of achieving compliance and is currently developing a plan that the City believes should achieve compliance. There are numerous technologies more (and not more costly) than sand filters at removing metals, including dissolve fractions, that are being considered for implementation throughout the Chollas Creek watershed.

The Port District commented that the discharges from Chollas Creek do not significantly affect inner Shipyard sediments. Predictions of mass discharges from Chollas Creek of copper, zinc, and lead as the TMDL is being implemented suggest that there will be no measureable increase in sediment concentrations of these constituents after remediation of Shipyards is complete. Accordingly, there should be no concerns that remediation goals cannot be met because of any concerns regarding recontamination from Chollas Creek.

The Port District commented that PCBs have never been detected in Chollas Creek water. In fact, the RWQCB discontinued the requirement for PCB monitoring in Chollas Creek because PCBs had never been detected. PCBs found in Chollas Creek mouth or Shipyard sediments are likely from sources other than Chollas Creek.

Additionally, the Port's experts agree that the remedial footprint can go forward without delay. While some parties may claim that the remediation cannot go forward unless the Chollas Creek outfall area is included within the remedial footprint or otherwise addressed because of recontamination concerns, the Port's designated fate and transport expert (Dr. Poon) has concluded that any interim resedimentation from Chollas Creek discharges will be insignificant,



and will not adversely impact the remediation efforts at the Shipyards. As such, the Port supports the exclusion of the mouth of Chollas Creek from the remedial footprint as well as the decision to move forward expeditiously with the remediation.

In rebuttal, NASSCO asserts that the Port's expert's conclusions should be given no weight because Dr. Poon's model, and the important data he used in the model are not available, thus his conclusions cannot be verified. Further, NASSCO asserts that Dr. Poon ignored sediment sampling results that show that silt and clay-sized particles do settle out at the mouth of Chollas Creek and are not dispersed throughout San Diego Bay with minimal deposition in the Shipyard Sediment Site. NASSCO reiterated its position that it is a basic concept of site cleanup that implementing measures to control the source of contaminants and to verify that control has been accomplished should proceed actual remediation. Accordingly, even if Dr. Poon's Declaration is accepted into the record and his testimony considered by the San Diego Water Board, his assertion that remediation can proceed prior to controlling storm water contaminant discharge to the Site contradicts basic tenets of site cleanup procedure.

#### **Response 4.1**

The Cleanup Team carefully considered source control in the development of the TCAO both in terms of eliminating continuing sources of sediment contamination to the Shipyard Sediment Site and to avoid recontamination of remediated sediments. The term "source control" in the context of contaminated sediment remediation refers to measures undertaken to identify and curtail continuing sources of contamination to ensure the permanence of contaminated sediment remedial actions and that remedial measures will not have to be repeated at a later date. Lack of source control might make sediment remediation efforts to reduce site-specific risks unsuccessful. In other cases, a continuing source, if not too significant, might simply limit the reduction that is achievable in contaminant levels.

Much of the contaminated sediment problems in San Diego Bay, including the Shipyard Sediment Site, are a legacy of the inadequate control of industrial and municipal discharges in both the years prior to the passage of the 1972 Clean Water Act and in subsequent years until effective control of the discharges was obtained. A major effort was launched to upgrade the NPDES requirements issued under the Clean Water Act for San Diego Bay discharges during the five year permit reissuance cycles beginning in the early 1990's and in subsequent cycles to eliminate or reduce pollutant mass emissions. Because of this continuing source control effort and the historic nature of the sediment contamination problem, the San Diego Bay sediments now largely serve as a contributor of contaminants to overlying water rather than as a sink for external sources. It is important to note that several major contaminated sediment sites were successfully cleaned up in San Diego Bay pursuant to San Diego Water Board CAOs during this period while source control efforts were underway.

Due to the stringent controls in NPDES permits and other regulatory measures, the volume of pollutants currently discharged from land based sources to the Shipyard Sediment Site is much less than in past decades. This is not to say that all land based sources of contaminants to the Shipyard Sediment Site are fully controlled, such as the MS4 discharges to Chollas Creek, and that further regulatory efforts to control them are not needed. Remediation efforts at the Shipyard Sediment Site, however, can proceed while regulatory steps are taken to improve

source control as was successfully done in past years at other San Diego Bay contaminated sediment cleanup sites.

Ideally, abating all sources of pollution before conducting a cleanup is the preferred approach. In this case, any further delays in cleaning up the Shipyard Sediment Site are not recommended in light of the time taken to get the project to the point of adopting a CAO, the relative risk of recontamination from Chollas Creek sources, and the early detection of increasing COC concentrations trends that post remediation monitoring will provide. Furthermore, removing the contaminant mass from the Shipyards Sediment Site is one of the many incremental steps needed to restore the "fishable" beneficial uses of San Diego Bay as a whole and should not be delayed. The risk that sediment quality-related beneficial uses at the Shipyard Sediment Site will become impaired again by recontamination from Chollas Creek is low because the time period between completing the two cleanups will be short (five to six years). In consideration of all of these factors, the public interest is best served by moving forward with this cleanup, even if it will be slightly ahead of some of the Chollas Creek cleanup and abatement activities.

Chollas Creek and other offsite discharges are, or will be, controlled by increasingly stringent requirements through the various regulatory approaches discussed below. The TCAO require the City and the Port to investigate and mitigate pollutants and pollutant sources in the watershed that drains to the MS4 outfall at the Shipyard Sediment Site (TCAO Directives 3, 4, and 5). As described in DTR Section 33.4, the upland source control will include investigation of the storm drain system and surrounding environs to identify sources of pollutants, clean out of residual sediments in the storm drain, and structural treatment control Best Management Practices (BMPs), where feasible, in the storm drain system to mitigate entry of pollutants into the storm drain to the maximum extent practicable.

The discharges from Chollas Creek are regulated by a number of different NPDES permits including the San Diego County MS4 permit, the CalTrans MS4 permit, the Industrial and Construction Storm Water Permits, and the Naval Base San Diego individual permit to name a few. These permits have become more stringent with each reissuance, and are the regulatory tools through which the various Chollas Creek TMDLs are being, or will be implemented. The Chollas Creek Diazinon TMDL waste load allocations are being implemented through water quality based effluent limitations in the San Diego County MS4 permit. Due to the federal ban on diazinon, Chollas Creek water quality currently meets diazinon Water Quality Objectives (WQOs).

The Chollas Creek watershed dischargers will be working to reduce waste loads from the creek to San Diego Bay during and after the cleanup of the Shipyard Sediment Site. Although sources of waste constituents from Chollas Creek may not be 100 percent controlled at the completion of the Shipyard Sediment Site cleanup, implementation of the TMDLs should ensure that Chollas Creek will not recontaminate the Shipyard Sediment Site to the degree that the restored sediment quality becomes so degraded that beneficial uses are impaired again.

Post remediation monitoring of the Shipyard Sediment Site should be capable of revealing if COC concentration trends are increasing. If any increasing trends are discovered, and Chollas Creek is indicated as the source, the San Diego Water Board can require accelerated cleanup and

abatement of the source before sediment quality at the Shipyards Sediment Site results in impaired beneficial uses.

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## RESPONSE 4.2

**DTR Section:** 4.7.1

**Comments Submitted By:** City of San Diego, NASSCO, Port District

**Comment IDs:** 11, 14, 16, 17, 18, 19, 376, 377, 378, 379, 380

### **Comment**

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ID 11

The City commented that the studies cited in the DTR do not support the DTR's conclusions regarding Chollas Creek's influence on chemicals of concern in shipyard sediments. The studies cited by the DTR in Section 4.3.1, page 4-3, provide insufficient support for the allegations in the DTR because they lack information that would allow a detailed peer review, thus preventing reproduction of the results, verification of all data and methods, and testing of hypotheses.

The data are not included in the reports, which prevents an independent scientific review of the information. The lack of data availability and independent review of such information, and its use in the DTR to assign responsibility to parties is particularly problematic since two of the three documents are authored by employees or contractors of the U.S. Navy, and one of the documents cited is published by the U.S. Navy, a party named as responsible for discharges to the Site.

ID 376

NASSCO rebutted the City's comment stating that the City has claimed no attempt to contact the authors of the studies to obtain the data they needed, despite the fact that the April 2008 DTR (p. 4-3) cited the same studies. The City also speculates, without basis, that the Katz, 2003 study, which was prepared by a Navy entity, could be biased because the Navy is a party. This type of speculation ignores that it is extremely common for potentially liable parties to prepare scientific and engineering studies for use by regulatory agencies in making determinations about remediation, and if given credence, would call into question virtually the entire body of environmental science. Furthermore, the City's comments implicitly recognize that those three studies cited support the conclusion that Chollas Creek impacts the NASSCO site.

ID 14

The City commented that evidence does not support surface water toxicity from Chollas Creek being transported to depth at the Shipyard Sediment Site. Specifically, Purple Sea Urchin fertilization in waters associated with the bottom sediments of the Site was over 87 percent in all samples (See Table 18-8, page 18-16 in DTR Volume 2). This is a level significantly above that seen in Schiff (2003), and comparable to the reference samples. This contradicts the DTR's assertions that Chollas Creek is contributing toxic levels of any substance to the Site. Further, toxicity tests including the urchin fertilization test have been conducted on the Site's sediments and there was no correlation between the chemical concentrations of copper, zinc, or lead, which are the primary constituents found in Chollas Creek waters, and the toxic effects measured.

ID 377

NASSCO rebutted this comment by noting that Schiff, 2003 described storm water plumes “formed relatively thin lenses 1 to 3 m, floating on top of the more dense bay water.” However, the City’s logical jump from this observation to a conclusion that Schiff, 2003 cannot stand as evidence that COCs are transported to the sediment of the Site has no merit because how the thick the storm water plume was does not say anything about whether contaminated sediment in the plume settled out of the plume and down into the Site sediments.

ID 19

The City of San Diego challenged the conclusion in Schiff 2003 that in-channel and plume toxicity was primarily due to trace metals including zinc and copper. The City of San Diego also challenged Schiff’s conclusions based on study methods and various data quality issues.

ID 16

The City commented that Schiff 2003 overstates the toxicity in the Chollas Creek freshwater plume because the plume map likely was based on geospatial extrapolations that don’t account for advection, dispersion, or transformations.

ID 378

NASSCO rebutted this comment noting that the City of San Diego speculated that Schiff 2003 used a geospatial technique such as Kriging, but the City’s speculative comments do not constitute substantial evidence.

ID 17

The City of San Diego commented that the hydrodynamic model reported in Chadwick et al. 1999 lacks important information influencing the fate and transport and therefore may be overstating impacts from Chollas Creek. The City states that the model does not appear to take into account physical obstructions to flow such as ships docked at piers at the mouth of Chollas Creek which typically touch bottom. Also, the half sine wave function of the tidal model does not match the creek discharges, hydrology, or storm functions of the region. The City states that it is not reasonable to conclude that Chollas Creek has introduced toxicity and pollutants to the Shipyard Sediment Site which is largely along the shoreline where physical obstructions occur.

ID 379

NASSCO rebutted this comment stating that even if this is true (the City provides no evidence for the point that storm events commonly last longer than one-half tidal cycles), the City provides no more sophisticated model itself, and has not shown that any potential inaccuracies would critically impair the Regional Board’s reliance on Chadwick 1999.

ID 18

The City of San Diego commented that measured Chollas Creek discharge data, as referenced in Katz et al., 2003, are insufficient for drawing conclusions that Chollas discharges have significantly impacted Shipyard Sediments. According to the DTR’s description of the Katz et al. (2003) study (DTR Section 4.7.1.3, page 4-15), the data in Katz (2003) included only one precipitation event over three days and data was generated using different collection methods for different areas. (Because the Katz (2003) study cannot be located, the City relies on the DTR’s

description of its contents). The data were extrapolated to derive conclusions as to the proportion of total impacts caused by Chollas Creek stormwater discharge versus stormwater discharge from NAVSTA. Upstream Chollas Creek stormwater samples were collected by the City of San Diego's contractor from two different tributaries on a flow-weighted basis and then composited into one sample. Stormwater samples from NAVSTA outfalls adjacent to the channel were collected on a time-proportional basis and composited into one sample. Flow weighted sampling provides a sample whose concentration represents the event mean concentration. Time proportional sampling does not, unless the flow rate is constant over the period of sampling. Storm flows are not constant. Therefore, the two sampling methodologies are not comparable and conclusions as to the difference (or lack thereof) in concentrations or mass loadings should not be made using this data.

ID 380

NASSCO rebutted this comment stating that it is important to note that the City's criticism does not affect one's ability to draw conclusions regarding the impact of Chollas Creek discharges on shipyard sediments. The poster prepared by Katz et al., 2003 also presents data in Figure 5 that characterize the plume emanating from Chollas Creek toward the Shipyard Site. It is this plume that potentially affects shipyard sediments. The City does not comment on this aspect of the Katz, 2003 poster. Accordingly, the City's comment has no merit with respect to conclusions of impact of Chollas Creek on the Shipyard Site. Attachment A, Exponent Critique, at 9.

#### **Response 4.2**

The City of San Diego's comments above deal with the significance of Chollas Creek discharges to sediment contamination at the Shipyard Sediment Site. The TCAO and DTR, however, do not make findings pertaining to the significance of the discharges. Further, the City's comments do not negate the fact that Chollas Creek is a source for the contaminants found at the Shipyard Sediment Site, and that pathways exist to transport sediment from the mouth of Chollas Creek area to the site. Detailed responses to the comments and rebuttal follow.

ID 11 and 376

The City commented that the scientific reports (journal articles, papers, reports, etc...) are insufficient and do not follow the scientific method because they do not allow for a detailed peer review that includes reproduction of the results, verification of all data and methods, and testing of hypotheses. What the comment fails to recognize is the basic goals reflected in the common research report format as related to the scientific method. The comment's requirement for journal articles to describe every action of the researcher and display all data collected and laboratory reports accumulated during a study is erroneous. Scientific reports reduce data to a manageable size for presentation (e.g. means, tables, etc...) and provide methods to a level of detail that enable colleagues to repeat the experiment, observation or study. Thus, the scientific method's incorporation into reports allows for experiments to be repeatable such that another scientist can understand the methodology and results to repeat the study and further test the hypothesis(es). Further, publications in peer-reviewed scientific journals serve to aid in maintaining the clarity of methodologies and reported results. The comment does not appear to be concerned with peer review for journal publication, or the scientific method and further hypothesis testing, but rather in conducting a "detailed peer review" that is simply an auditing of report data.

Regarding the Schiff et al. 2003 report (SAR286566), and its supporting data, as stated by NASSCO, any questions on the report could have been directed to Mr. Schiff. The Southern California Coastal Water Research Project (SCCWRP) is a recognized leader in sediment and water quality investigations, and the Cleanup Team is satisfied that the authors of Schiff et al. 2003 used appropriate data and methods. All geospatial techniques, such as kriging, have limitations. The Cleanup Team is satisfied that the authors of Schiff et al. 2003 understood the limitations of the methods they used, and did not report conclusions that couldn't be supported by the data and analytical techniques used.

The Katz et al. (2003) poster is in the Administrative Record and can be found at SAR375698. While the poster presentation may not be peer-reviewed in a scientific journal process, the information presented does prescribe to the principles of the scientific method and provides additional information regarding storm water related to the TCAO Finding.

The Cleanup Team agrees with NASSCO's comment that the reports authored by U.S. Navy employees and/or contractors are not implicitly biased for the U.S. Navy.

IDs 14, 16, 19

In Section 4, the DTR cites the conclusions of Schiff et al. (2003) to show a linkage between Chollas Creek in-channel toxicity and potential impairments in the receiving water of San Diego Bay. This study was cited, along with Katz et al. (2003; SAR375698), and Chadwick et al. (1999; SAR2811495), to show that Chollas Creek is a source for the COCs found at the Shipyard Sediment Site. The DTR does not draw the conclusion that the toxic Chollas Creek stormwater plume itself creates toxic conditions in sediments at the Shipyard Sediment Site, nor does it link the likely cause of toxicity in the stormwater plume to the cause of toxicity in the Shipyard sediments. In fact, no stressor identification studies were conducted at the Shipyard Sediment Site. The issue, as pointed out in NASSCO's rebuttal, is that the Chollas Creek stormwater plume is a pathway for the transport of contaminated sediment to the Shipyard Sediment Site. The accuracy of the measurement of the toxicity of the plume is not critical to the DTR's findings.

A recent study by the City showed that throughout the Chollas Creek watershed, toxic sediment was found within the MS4. A reasonable assumption is that this toxic sediment is discharged to San Diego Bay during storm events. The Chollas Creek and Paleta Creek Storm Drain Characterization Study (City of San Diego, 2010) concluded that the primary causes of sediment toxicity during dry weather events were 1) synthetic pyrethroids, 2) zinc for the North Chollas sites, and 3) the trace metals copper, lead, nickel, and zinc; PCB Aroclor 1254; PAHs; and chlordane. No wet weather sediment toxicity tests were performed.

ID 17 and 379

The City commented that Chadwick et al. (1999), did not take into account obstructions to flow that would limit the deposition of contaminated sediment from Chollas Creek stormwater plumes in the Shipyard Sediment Site. All hydrodynamic models have limitations. The potential limitations to the Chadwick et al. (1999) study, however, do not negate the DTR's finding that Chollas Creek stormwater plumes transport contaminated sediments to the Shipyard Sediment

Site. Whether or not Chadwick et al. (1999) overstates the contribution goes to allocation of responsibility and does not exculpate the City.

ID 18

The City criticized the Katz et al. (2003) study for using different storm water sample collection methods and stated that the measured Chollas Creek discharge data was insufficient for drawing conclusions that Chollas Creek discharges have significantly impacted the Shipyard sediments. The DTR does not make findings on the level of significance of Chollas Creek stormwater discharges as a source of contaminated sediment to the Shipyard Sediment Site. The DTR notes only the following conclusions from Katz et al. (2003):

1. During a single storm event in 2001, the sediment plume containing pollutants from Chollas Creek was measured to cover an area up to 1.2 km away from the mouth of Chollas Creek.
2. Storm water plumes developed off Chollas Creek quickly after the start of rainfall and were dispersed through tidal mixing 12 hours after runoff ceased.
3. Contaminants were primarily associated with particles and their strong association with Total Suspended Solids (TSS) provides a good first order approximation for their distribution.
4. Storm water is a continuing source of excessive levels of lead, zinc, chlordane, Dichlorodiphenyltrichloroethane (DDT), and PCBs, and possibly for TPAH and mercury to sediment at the mouth of Chollas Creek.

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### RESPONSE 4.3

**DTR Sections:** 4.6, 4.7.2, 4.7.3

**Comment Submitted By:** City of San Diego, NASSCO, BAE Systems

**Comment IDs:** 23, 25, 381, 382, 471

**Comment**

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ID 23, 25

The City of San Diego commented that the DTR's conclusions that discharges from storm drain outfalls SW4 and SW9 have contributed to elevated levels of constituents of concern observed in shipyard sediments are not supported by adequate data. The City commented that Sections 4.6, 4.7.2, and 4.7.3 of the DTR set forth certain conclusions regarding the contents of storm water released through SW4 and SW9. None of these conclusions is based on reliable data.

No storm water samples have ever been collected from SW4. The watershed drained by SW4 differs in size and land use from the watershed drained by Chollas Creek. There are no data that would show that Chollas Creek storm water is chemically similar to SW4 storm water. Therefore, it is inappropriate to conclude that SW4 carried the same pollutants to the Shipyard that the Chollas Creek carries to its mouth.

With respect to the catch basin sampling event, following the sampling event in 2005, the catch basin was cleaned out by SDG&E per the requirements in the Notice of Violation issued by the City of San Diego to SDG&E (Zirkle, 2005; TN& Associates, 2006). There are no data showing

that SW4 currently has any PCBs in it or that it is currently contributing to pollution of sediments at the Shipyards site.

The presence of chemicals of concern at sediment sampling stations SW20 through SW25 where ship building, ship repair, ship mooring, and ship moving operations took place does not indicate that the chemicals of concern came from SW4 in sufficient quantity to cause the observed concentrations or effects in those sediments. In fact, ship building, ship repair, ship mooring, and ship moving operations have been documented to have historically produced and discharged significant quantities of wastes containing the chemicals of concern found at the Shipyard site (RWQCB, 1972, 1994; USEPA, 1974; Pacific Northwest Pollution Prevention Resource Center, 1997; Schafran et al, 1998; Anchor Environmental, 2005; United States Department of Navy (USDN), 2006), Science Applications International Corporation (SAIC), 2007)

Historically, prior to the year 2000 timeframe, SW4 drained the BAE leasehold. Based on the types and quantities of wastes produced in ship building and repair operations, runoff from the BAE leasehold is likely to have contained significant quantities of chemicals of concern found in Shipyards sediments.

First, no samples of storm water have ever been collected from the SW9 storm drain. Second, Section 4.7.3 of the DTR is basing its conclusions entirely on the results of a single sediment sample collected from the Bay at NA-22. Given NA-22's proximity to large ship repair, moorage, and other industrial waterfront operations, the DTR's claims that concentrations of chemicals found at NA-22 can be attributed to SW9 because urban runoff "typically" contains pollutants is inappropriate (RWQCB, 1972, 1994; USEPA, 1974; Pacific Northwest Pollution Prevention Resource Center, 1997; Schafran et al, 1998; Anchor Environmental, 2005; United States Department of Navy (USDN), 2006), Science Applications International Corporation (SAIC), 2007). The toxins in the sediment data are attributable to nearby industrial activity, and there is no basis set forth in the DTR for attributing the pollutant levels to discharges from SW9. Third, SW9 discharges into the mouth of Chollas Creek. Water leaving SW9 will be subject to the same hydrodynamic forces as water leaving Chollas Creek during a storm event. As noted above (see Comment 1.1), the studies conducted to date do not show that suspended solids from this discharge cause toxicity in shipyard sediments.

Fourth, historically, prior to the year 2000 timeframe, SW9 drained the NASSCO leasehold, which, based on the types and quantities of wastes produced in ship building and repair operations, is likely to have contained significant quantities of chemicals of concern found in Shipyards sediments.

IDs 381, 382

In rebuttal, NASSCO provided the following comments. The City of San Diego contends that the DTR lacks "reliable data" to assert that the City is discharging COCs through storm water outfalls SW4 and SW9. The City bases this claim on the fact that there is no monitoring data available from either SW4 or SW9 to indicate specific quantities of COCs in the runoff.

As noted in the DTR, urban runoff itself is classified as a "waste" under the California Water Code § 13050(d). DTR at 11-8; see also Cal. Water Code §§ 13392 (State and Regional Boards



to coordinate with Departments of Public Health and Fish & Game to develop “new programs to reduce urban and agricultural runoff”); 13396.7(a) (commissioning a study to determine adverse health effects of urban runoff on swimmers at urban beaches). In fact, the DTR includes substantial evidence that urban runoff in San Diego contains COCs at the Site, including “total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.” DTR at 11-8; see also 4-10 (San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring Final Report submitted by the City indicating that “elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay”).

Furthermore, the DTR demonstrates that samples taken in the SW4 catch basin, and laterals entering the catch basin, “indicate the presence of both PCBs and PAHs entering and exiting the municipal storm drain system catch basin . . . .” DTR at 4-16. Far from suffering from a lack of evidence, the DTR has presented substantial evidence that San Diego urban runoff contains relevant COCs, but simply did not take the extra step to quantify the amount of COCs that actually are present in storm water flows as they exit the SW4 and SW9 outfalls.

Notably, the City’s comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the City presents no affirmative evidence to show that they do not. Instead, the City attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

Finally, as also noted in the DTR, “[i]n the absence of such direct evidence, the San Diego Water Board may consider relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304.” DTR at 10-13, citing State Resolution 92-49, § I.A (directing the Regional Boards to use “any relevant evidence, whether direct or circumstantial”, when determining whether a party should be required to investigate or cleanup a discharge of waste). Accordingly, even if storm water sampling data from SW4 and SW9 is unavailable, it is proper for the Regional Board to consider and rely on other direct and circumstantial evidence that leads to the conclusion that the City’s storm water discharges have contaminated the NASSCO shipyard.

ID 417

In rebuttal to the City’s comments, BAE Systems commented that substantial and reasonable evidence supports the DTR’s assertion that the City’s SW4 outfall has contributed to elevated levels of pollution at the BAE leasehold.

#### A. 2009 SW4 Sampling Data Detects PCBs, Copper, TBT and Mercury

On December 7, 2009, water quality data from SW4 were collected from a manhole on the BAE leasehold. (CalScience Environmental Laboratories, 2009). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site.

Laboratory analyses included a congener-level analysis of PCBs. Multiple congeners were detected, and the highest concentrations were of penta- and hexa-chlorinated biphenyls, similar to the profile of Aroclor 1254. (Id.) Copper, mercury, and TBT were also measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of 2009 there was an ongoing source of PCBs, copper, mercury and TBT from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2009 have dissipated, nor have upland source control measures been established, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

#### B. 2005 SW4 Sampling Data from City Investigation Detects PCBs and PAHs

Further evidence of discharges from the City's storm drain SW4 into the Shipyard sediment site is provided by the results of a sampling investigation conducted by the City itself. As described in the DTR (section 4.7.2), on October 3, 2005, the City conducted an investigation and observed evidence of an illegal discharge into the SW4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems' parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. During the City's investigation, three sediment samples were collected and analyzed for PCBs and PAHs. The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the east. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from the north. The third sample was collected from the 18-inch pipe exiting the catch basin. The results of these three samples, presented in DTR Table 4-4, indicate the presence of PCBs and PAHs entering and exiting the municipal storm drain system catch basin. The results of this sampling show significant concentrations of Aroclor 1254 and 1260. (DTR Table 4-4.)

The City's Comment 3.0 does not dispute any of the foregoing facts or findings. Instead, the City refers to alleged facts regarding SDG&E cleaning out the catch basin following the investigation. Those alleged facts are irrelevant under Water Code section 13304 for the reasons stated in Section I infra.

#### C. 2001 SW4 Sampling Data Detects TBT, Copper and Mercury

On November 29, 2001, water quality data from SW4 were collected from a manhole on the BAE leasehold. (AMEC, 2001). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. TBT, copper, and mercury were all measured and detected in the urban storm water conveyed by SW4. (Id.) These data indicate that as of late 2001 there was an ongoing source of TBT, copper, and mercury from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2001 have dissipated, nor have upland source control measures been established, and moreover the 2009 SW4 data again detects these same COCs in addition to PCBs, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

D. Historical Discharges by the City through SW4 have Significantly Contributed to Contamination at the Site.

In 1974 the SCCWRP published the results of an EPA-funded study entitled "Marine Inputs from Polychlorinated Biphenyls and Copper from Vessel Antifouling Paints." (Young et al., 1974.) The project surveyed the usage of PCB-containing hull paint on recreational, commercial, and Navy vessels in San Diego Bay and other southern California bays, and as collected data on PCB releases in municipal wastewater and storm runoff. (Id.)

Contrasting the PCB mass release rates for different sources (Table 12 in Young et al. 1974) shows that municipal wastewater was a major source of Aroclor 1254 to San Diego Bay, contributing more than 99.9 percent of total PCBs. Thus, as of 1974, municipal wastewater carried by the City's MS4 system and discharged via SW4 was a major source of PCB contamination at the BAE Leasehold. (Id.) The City identifies no study or data indicating that the sources of PCBs to the San Diego Bay was by any means other than those identified by Young, et al. Absent findings to the contrary, it is reasonable to conclude that the City was a major contributor of PCBs to the San Diego Bay for decades.

E. EPA Guidance Confirms that Waste Water Discharged by the City through SW4 has Significantly Contributed to Contamination at the Site

Relevant EPA guidance supports the DTR's findings with respect to waste in urban storm water discharged through the City's SW4 outfall at the BAE Leasehold. In 1983 the EPA published "Results of the Nationwide Urban Runoff Program." The Executive Summary states that among the many objectives of the National Urban Runoff Program ("NURP") was to develop analytical methodologies to examine "the quality characteristics of urban runoff, and similarities or differences at different urban locations" and "the extent to which urban runoff is a significant contributor to water quality problems across the nation." (EPA, Results of the Nationwide Urban Runoff Program, Executive Summary at p. 1.) "The NURP studies have greatly increased our knowledge of the characteristics of urban runoff, its effects upon designated uses, and of the performance efficiencies of selected control measures." (Id. at p. 2.) The NURP Final Report reached several relevant conclusions, including:

- "Heavy metals (especially copper, lead and zinc) are by far the most prevalent priority pollutant constituents found in urban runoff. End-of-pipe concentrations exceed EPA ambient water quality criteria and drinking water standards in many instances. Some of the metals are present often enough and in high enough concentrations to be potential threats to beneficial uses." (Id. at p. 5.)
- "Total suspended solids concentrations in urban runoff are fairly high in comparison with treatment plant discharges. Urban runoff control is strongly indicated where water quality problems associated with TSS, including build-up of contaminated sediments, exist." "[T]he problem of contaminated sediment build-up due to urban runoff...undeniable exists." (Id. at p. 6.)

- "A summary characterization of urban runoff has been developed and is believed to be appropriate for use in estimating urban runoff pollutant discharges from sites where monitoring data are scant or lacking, at least for planning level purposes." (Id. at p. 7.)

With respect to this last conclusion regarding the development of a summary characterization, the NURP Report states that "[a]lthough there tend to be exceptions to any generalization, the suggested summary urban runoff characteristics given in Table 6-17 of the report are recommended for planning level purposes as the best estimates, lacking local information to the contrary." (Id. at p. 7.) "[I]n the absence of better information the data given in Table 6-17 are recommended for planning level purposes as the best description of the characteristics of urban runoff." (EPA, Results of the Nationwide Urban Runoff Program, Volume I – Final Report, at p. 6-43.) Those characteristics of urban runoff include the presence of significant levels of pollutants including total suspended solids, heavy metals, inorganics, and pesticides. (Id., at Tables 6-17 through 6-21.) The NURP data supports and confirms the DTR's assertion that:

"The City of San Diego has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR, § 4.4.)

The NURP data also supports and confirms the DTR's assertion that "it is highly probable that historical and current discharges from [SW4] outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site." (DTR § 4.7.2.)

### **Response 4.3**

The City of San Diego argues that the DTR lacks "reliable data" to assert that the City storm water outfall SW4 and SW9 discharges contributed to elevated levels of COCs observed in shipyard sediments. The City based its claim in part on the fact that there is no *in situ* monitoring data available for the SW4 or SW9 discharges to fully characterize and document specific quantities of COCs in the discharges. The City's comments do not allege that storm water discharges from SW4 or SW9 do not contain relevant COCs, and the City presents no affirmative evidence to show that they do not. The Cleanup Team agrees with the rebuttals on this issue submitted by both NASSCO and BAE Systems.

As noted in DTR Section 1 at page 1-5 in the absence of direct evidence, Resolution No. 92-49 provides that the Regional Water Boards shall consider any relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under Water Code section 13304. Accordingly, even if storm water sampling data from SW4 and SW9 is unavailable, it is proper for the San Diego Water Board to consider and rely solely on other relevant direct and circumstantial evidence to support the conclusion that the City's SW4 and SW9 storm water discharges has contributed to elevated levels of COCs at the Shipyard Sediment Site. The DTR presents substantial evidence consistent with the requirements of Resolution No. 92-49 to support the

conclusion that the City's SW4 and SW9 discharges contained relevant COCs and contributed to elevated COC levels in Shipyard sediments.

The DTR provides at page 4-5 that urban runoff contains "*waste*" within the meaning of Water Code section 13050(d). The DTR subsequently notes that the discharge of urban runoff from an municipal separate storm sewer system (MS4) is also a "*discharge of a pollutant from a point source*" within the meaning of the CWA as defined in 40 Code of Federal Regulations (CFR) 122.2. DTR Section 4, page 4-3 notes that SW4 and SW9 are components of the City's MS4 conveyance system that convey urban runoff from upgradient source areas and discharge directly into the Shipyard Sediment Site within the BAE Systems leasehold via SW4 and the NASSCO leasehold via SW9 .

The DTR notes at page 4-5 that urban runoff typically contains .... " total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash." A finding to this effect, including underlying references and studies supporting the finding, is included in Municipal Phase 1 MS4 permits and fact sheets issued by the San Diego Water Board. (See for example SAR 259485, Finding 7 of Order No. 2001-001, NPDES Permit No. CAS)108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County and the San Diego Unified Port District.*) (See also DTR Section 4. Footnote 46 at 4-6). The San Diego Water Board's Basin Plan contains a similar finding at page 4-79 and goes on to conclude that urban runoff pollutant levels are high enough to severely degrade the beneficial uses of surface waters, and threaten the health of both humans and aquatic organisms. The Basin Plan also cites U.S. EPA *Nationwide Urban Runoff Program (NURP) study* (U.S. EPA, 1983. *Results of the Nationwide Urban Runoff Program, Volume 1- Final Report*, Office of Water. Washington, D.C.), which provides insight on what can be considered background levels of pollutants in typical urban runoff.

Because site specific studies providing a complete chemical characterization of the SW4 and SW9 discharges were not available, the Cleanup Team relied in part on broad based assessments in well known national studies of urban storm water runoff and related water quality impacts as a basis to characterize the SW4 and SW9 discharges including the U.S. EPA 1983 NURP study. A major element of the NURP study, executed between 1978 and 1983, was the collection of samples to characterize the quality of urban storm water. Data collected under the NURP study indicated in part that metals were the most prevalent priority pollutants found in urban runoff, and the concentrations for the metals were generally found to exceed freshwater aquatic life criteria. MS4 discharges from residential, commercial, and light industrial areas were characterized as carrying more than 10 times the annual loadings of total suspended solids (TSS) than discharges from municipal sewage treatment plants. Seventy-seven priority pollutants were detected, in samples of storm water discharges from residential, commercial and light industrial lands, including 14 inorganic and 63 organic pollutants. The table below taken from U.S. EPA, *National Pollutant Discharge Elimination System NPDES Regulations for Storm Water*

*Discharges*, FR 55 47990, Federal Register Publication, November 16, 1990, (U.S. EPA 1990) shows the priority pollutants detected in at least ten percent of the NURP discharge samples which were sampled for priority pollutants.

**Table 4.1 - Priority Pollutants Detected in at Least 10 Percent of NURP Study Samples<sup>1</sup>**

Constituent	Frequency of detection (in percent)
Metals and Inorganics	
Antimony	13
Arsenic	52
Beryllium	12
Cadmium	48
Chromium	58
Copper	91
Cyanides	23
Lead	94
Nickel	43
Selenium	11
Zinc	94
Pesticides	
Alpha - hexachlorocyclohexane	20
Alpha - endosulphan	19
Chlordane	17
Lindane	15
Halogenated aliphatics	
Methane, dichloro	11
Phenols and creosols:	
Phenol	14
Phenol, pentachloro	19
Phthalate esters	
Phthalate, bis(2-ethylhexyl)	22
Polycyclic aromatic hydrocarbons	
Chrysene	10
Fluoranthene	16
Phenanthrene	12
Pyrene	15

1. Table Taken From U.S. EPA (1990)

Table 4.1 above of NURP data shows that six COCs of concern at the Shipyard Sediment Site (copper, HPAHs, arsenic, cadmium, lead, and zinc) described in TCAO Finding 29 have significant frequencies of detection in urban runoff discharges. The table provides an additional basis for the Cleanup Team's conclusions that the SW9 and SW9 likely discharged these COCs and thereby contributed to the contaminant levels found at the Shipyard Sediment Site. Many other studies such as those cited in the federal register publication *National Pollutant Discharge Elimination System NPDES Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges*, FR 64 68722, Federal Register Publication, December 8, 1999 (U.S. EPA 1999) and NRC (2008) have since been conducted by U.S. EPA, states, academia, associations, and others which corroborate the NURP study findings and further

characterize and report on the potential receiving water quality impacts of storm water from a variety of urban and nonurban sources.

The DTR cites at page 4-10 supporting discharge data in the San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring Final Report and DTR Table 4-2 as evidence demonstrating that that elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay. The DTR also notes at page 4-19 that the surface sediment data at NASSCO sample station NA22, located near the SW9 outfall shows elevated concentrations of total HPAHs at 3,600 microgram/kilograms (ug/kg), DDT at 29.7 ug/kg, and chlordane at 21.1µg/kg. These pollutant levels are indicators of an urban runoff source and indicate that historical urban runoff discharges occurred from the SW9 outfall.

DTR Section 4 cites at page 4-16 and Table 4-4 storm drain sediment samples which indicate the presence of both PCBs and PAHs entering and exiting the SW4 municipal storm drain system catch basin. The DTR also notes at page 4-18 that sediment PCB levels, specifically Aroclors - 1254 and 1260, and sediment PAH levels reported in the storm water conveyance system are also reported in the bay sediment near the SW4 outfall as indicated by comparing DTR Tables 4-5 and 4-6.

These pieces of evidence constitute circumstantial evidence of the City of San Diego's contribution of relevant COCs to the Shipyard Sediment Site. Stated somewhat differently, the evidence supports a finding that relevant COCs are commonly discharged in urban runoff, and that the City of San Diego operates the SW4 and SW9 conveyances that present a plausible pathway for those COCs to be discharged to the Site. For all of these reasons the Cleanup Team asserts that there is substantial and credible evidence, consistent with the requirements of Resolution No. 92-49, to support TCAO Finding 4 and DTR Section 4 conclusions that the City's SW4 and SW9 discharges contained relevant COCs and contributed to elevated COC levels in Shipyard sediments.

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## **5. TCAO Finding 5 and DTR Section 5: Star & Crescent Boat Company**

Finding 5 of TCAO No. R9-2011-001 States:

The San Diego Water Board alleges, but Star & Crescent Boat Company (hereinafter “Star & Crescent”) denies, that Star & Crescent caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH. Between 1914 and 1972, San Diego Marine Construction Company operated a ship repair, alteration, and overhaul facility on what is now the BAE Systems leasehold at the foot of Sampson Street in San Diego. Shipyard operations were conducted at this site over San Diego Bay water or very close to the waterfront. An assortment of waste was generated at the facility, including spent abrasive blast waste, paint, rust, petroleum products, marine growth, sanitary waste and general refuse. In July 1972, San Diego Marine Construction Company sold its shipyard operations to Campbell Industries, and changed its corporate name, effective July 14, 1972, to Star & Crescent Investment Co. On March 19, 1976, Star & Crescent Boat Company was incorporated in California and on April 9, 1976, Star & Crescent Investment Co. (formerly San Diego Marine Construction Company) transferred all of its assets and liabilities to Star & Crescent. Accordingly, Star & Crescent is the corporate successor of and responsible for the conditions of pollution or nuisance caused or permitted by San Diego Marine Construction Company. Based on these considerations, Star & Crescent is referred to as “Discharger(s)” in this CAO.

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### **RESPONSE 5.1**

**DTR Section:** 5

**Comments Submitted By:** Star & Crescent, San Diego Unified Port District, City of San Diego

**Comment IDs:** 69, 283, 288, 290

**Comment**

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Star & Crescent Boat Company (Star & Crescent) argues that it should not be named as a discharger under the TCAO because it did not directly contribute to the condition of pollution or nuisance at the Shipyard Sediment Site, and because it is not the legal successor in interest to San Diego Marine Construction Company (SDMCC) and Star & Crescent Investment Company (Invest Co), an entity that admittedly did contribute to the condition of pollution or nuisance. Campbell Industries Inc., the Port District and the City of San Diego counter that Star & Crescent should remain a named discharger because it is a legal successor to SDMCC and Invest Co based on one or more “corporate successor” theories established by California law.

### **Response 5.1**

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#### **Introduction, Summary of Comments and Recommendation**

Star & Crescent argues that it should not be named as a discharger under the TCAO because it did not directly contribute to the condition of pollution or nuisance at the Shipyard Sediment Site, and because it is not the legal successor in interest to San Diego Marine Construction



Company (SDMCC) and Star & Crescent Investment Company (Invest Co.),<sup>1</sup> an entity that admittedly did contribute to the condition of pollution or nuisance. Campbell Industries Inc., the Port District and the City counter that Star & Crescent should remain a named discharger because it is a legal successor to SDMCC and Invest Co. based on one or more “corporate successor” theories established by California law. **In light of the comments received by the Designated Parties, as set forth in detail below, the Cleanup Team continues to recommend that Star & Crescent be named as a discharger in the TCAO as the corporate successor of SDMCC and Invest Co.**

### **Legal Standards for Establishing Corporate Successor Liability**

The Cleanup Team and all commentors, including Star & Crescent, agree on the law governing the establishment of corporate successor liability. A corporation that purchases the assets of another business entity does not assume the seller’s liabilities unless: (1) the purchaser expressly or impliedly agrees to assume the seller’s liabilities (assumption theory); (2) the transaction amounts to a consolidation or merger of the two entities (de facto merger theory); (3) the purchaser is a mere continuation of the seller (mere continuation theory); **or** (4) the asset transfer was made for the fraudulent purpose of avoiding liability (fraudulent transfer theory). *Ray v. Alad Corp.* (1977) 19 Cal.3d 22, 28. All parties further agree that SDMCC’s name change to Invest Co. had no effect on its legal responsibility for causing and contributing to the condition of pollution or nuisance at the Shipyard Sediment Site.

Star & Crescent argues that none of these theories of corporate successor liability apply to it, and that Invest Co. retains the liabilities of SDMCC. The City of San Diego argues that the mere continuation and the fraudulent transfer theories apply to Star & Crescent’s acquisition of Invest Co’s assets. Campbell argues that the de facto merger theory applies to the transaction. The Port District argues that the assumption, de facto merger, and mere continuation theories apply to the transaction. As detailed below, record evidence establishes that Star & Crescent is the corporate successor and legally responsible for Invest Co’s discharges to the Shipyard Sediment Site.

### **Substantial Evidence Indicates Star & Crescent Boat Assumed Invest Co.’s Liabilities**

The Port District correctly notes that whether there has been an express or implied assumption of liabilities is a question of fact, citing *In the Matter of Petition of Purex Industries, Inc.*, State Water Board Order No. WQ 97-04. The facts are these. In 1976, Invest Co offered to sell Star & Crescent all of its “right, title and interest of every kind and description in and to its business and assets pertaining to its harbor excursion business,” “but subject to all liabilities of said business as of March 31, 1976, as relate to its harbor excursion business.” See Exhibit 17 to Star & Crescent’s initial comments [4/9/1976 Minutes of Meeting of Board of Directors of Star & Crescent, p. S&C0050].

Star & Crescent argues that, despite the specific statement in the Meeting Minutes that it agreed to accept “**all liabilities**” of Invest Co, it did not agree to accept “all liabilities” because there is a discreet list of assets and liabilities attached to the offer sheet, and that list establishes a limit on

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<sup>1</sup> In 1972, SDMCC changed its name to Star & Crescent Investment Company. The name change had no legal effect on Invest Co’s legal responsibility for the acts and omissions of SDMCC.

the liabilities it agreed to assume. While the argument might have merit in a different context, it fails here. First, there is no list of assets or liabilities that Invest Co agreed to retain. If the parties to the transaction intended for some liabilities to pass through to the buyer, and others to remain with the seller, the logical manifestation of that intent would be two lists, one of liabilities transferred and one of liabilities retained. But there is only one list. As the Port District argues, “when read in full context, the exhibit list served as nothing more than a list of the known harbor excursion business assets and liabilities, not a limitation on the intended scope of the transfer.” The asset purchase agreement and its exhibits contain no language that would indicate that Invest Co intended to transfer the known liabilities set forth on the list and retain any known liabilities or unknown liabilities such as the liability for future environmental cleanups. In short, there is no reason to conclude, as Star & Crescent urges, that the statement “all liabilities” in the document does not mean precisely what it says.

Second, evidence in the record indicates that Invest Co had no other business operations, assets, or liabilities, despite Star & Crescent’s assertion that Invest Co continued to “own and operate its many other diverse assets.” As the Port District notes, there is no evidence the Invest Co was involved in any business operations other than Star & Crescent’s operations until over one and a half years after the asset purchase transaction. *See* Star & Crescent’s Exhibit 11. Mr. Palermo, Star & Crescent’s person most knowledgeable, further testified at his deposition that he was unaware of any Invest Co assets that were not transferred to Star & Crescent as part of the transaction. Accordingly, the only known Invest Co business operations, assets, or liabilities at the time of the transfer of all assets and all liabilities to Star & Crescent in 1976 were those relating to the sole remaining SDMCC operation owned by Invest Co – those of the boat division. Because Invest Co was not engaged in any business enterprises immediately after the transfer, it is more likely than not that, at the time of the transaction, the parties intended to transfer “all liabilities” both known and unknown, from Invest Co to Star & Crescent.

### **Substantial Evidence Indicates The Invest Co/Star & Crescent Transaction Was a De Facto Merger**

A transaction the parties define as an asset sale may nevertheless be considered a de facto merger and result in the transfer of the seller’s liabilities to the buyer as a matter of law when: (1) the consideration paid for the seller’s assets consisted solely of the buyer’s stock; (2) the purchaser continued the same business enterprise after the sale; (3) the shareholders of the seller became the shareholders of the buyer; (4) the seller liquidated; **and** (5) the buyer assumed the liabilities necessary to carry on the business enterprise of the seller. *Marks v. Minnesota Mining & Mfg. Co.* (1986) 187 Cal.App.3d 1429, 1436. Star & Crescent does not dispute that it transferred all of its stock to Invest Co in exchange for the boat division assets and liabilities, nor that there was no additional consideration paid to Invest Co. Thus, the first element of the de facto merger theory is met. Since Invest Co owned all the stock of Star & Crescent, the shareholders of both entities were identical and the third element is also met.

The second element is met because the facts indicate that Star & Crescent continued the same business enterprise in which Invest Co was engaged after the transaction. Specifically, record evidence establishes that Star & Crescent operated the same harbor excursion business using the same Star & Crescent name with the same vessels and out of the same locations. With respect to

the fourth element, there is no evidence in the record to indicate that Invest Co was engaged in any other business enterprises at the time of the transaction, and it effectively ceased all of its business operations at that time, even though it would engage in other business operations over a year and a half later. Thus, while Invest Co did not formally liquidate immediately after the transaction, it was effectively “out of business” for over a year and a half afterwards.<sup>2</sup> Finally, with respect to the fifth element, as discussed above, Star & Crescent expressly agreed in the asset purchase transaction to assume “all liabilities: of Invest Co “as relate to its harbor excursion business.”

The evidence submitted largely by Star & Crescent itself indicates that it is the corporate successor of Invest Co under the de facto merger theory.

### **Substantial Evidence Indicates The Invest Co./Star & Crescent Transaction Was a Mere Continuation**

Corporate successor liability passes to an asset purchaser under the mere continuation theory when: (1) no adequate consideration was given for the seller corporation’s assets and made available to meet the claims of its unsecured creditors; or (2) one or more persons were officers, directors of stockholders of both corporations. *Ray v. Alad Corp.*, *supra*, 19 Cal.3d at 29. Record evidence supporting the mere continuation theory of successor liability for Star & Crescent is exceptionally strong.

On April 9, 1976, Star & Crescent’s directors voted to acquire the significant harbor business related assets of Invest Co in exchange for 1,500 shares of newly created stock. Star & Crescent, Exhibit 23. The Star & Crescent directors valued the stock at \$10 per share, while the Invest Co assets purchased were valued at about \$800,000. Thus, Star & Crescent purchased the \$800,000 worth of assets from Invest Co for \$15,000 worth of stock. While it appears that Star & Crescent may also have assumed \$86,000 of Invest Co’s liabilities under the transaction, it is unclear which of the two entities ultimately satisfied those liabilities given that Invest Co was still paying Star & Crescent’s directors’ salaries and bonuses for a number of years following the transaction. In any event, even assuming Star & Crescent did assume and satisfy the entire \$86,000 in listed liabilities, the consideration paid for the approximately \$800,000 in assets would still have been a mere \$101,000, or a small fraction of the actual value of the assets. This is not adequate consideration.

Star & Crescent appears to implicitly concede this point, instead arguing that adequate consideration was given because Invest Co later sold the stock that it received for \$765,400. The argument lacks merit. First, this later transaction is irrelevant since adequate consideration must be given at the time of sale – not years later. Second, this “sale” involved issuance of a promissory note, under which Invest Co apparently agreed to relinquish the only consideration it

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<sup>2</sup> In fact, as chronicled in detail by the City in support of its fraudulent transaction theory, it appears that Invest Co’s “business enterprises” after the transaction consisted solely of managing and operating Star & Crescent, including, primarily, distributing its earnings and profits to O.J. Hall Jr. and his family members. Because the Cleanup Team believes that Star & Crescent is properly named as a discharger under the TCAO as the corporate successor of Invest Co under the assumption theory, the de facto merger theory and, most persuasively, the mere continuation theory, we see no need to discuss the merits of a potential fraudulent transfer theory.

received for its assets (the 1,500 shares of stock) in exchange for a promise to be paid five years later. Third, Invest Co sold the stock to the directors of Star & Crescent, Stephen P. Carlstrom, Judy Hall, and Janet Miles, who also were Hall, Jr.'s children and wife. (See Exhibit 22 [Shareholder certificates for Star & Crescent dated October 26, 1976] and Exhibit K [Hall, Jr. Obituary].) In fact, Hall, Jr. had long before expressed to the Port District his desire to transfer ownership of his harbor excursion business to his children. (Exhibit H [October 12, 1976 correspondence].)

While the exact mechanisms of the transactions are somewhat blurry because of Star & Crescent's failure to provide supporting documents, what can be determined is that Invest Co divested itself of all known assets in exchange for stock in a new company with no assets other than the Invest Co assets transferred to it in the transaction. It then later agreed, in essence, to front the price of the sale of this stock back to Star & Crescent's leaders, who were the children and spouse of the man that had been controlling Invest Co. This simply does not constitute adequate consideration.

The City and Port District detail a number of additional facts in their respective comments regarding the inadequacy of the consideration paid by Star & Crescent that will not be repeated here, but that are incorporated herein by this reference. The evidence supporting the inadequacy of the consideration paid for Invest Co's assets alone is enough to support a mere continuation theory of liability for Star & Crescent.

However, there is an alignment of the identity of officers, directors and shareholders in Invest Co and Star & Crescent as well. As discussed above, the shareholders in Star & Crescent and Invest Co were identical. Star & Crescent was incorporated on April 7, 1976 and six directors, none of whom were on the Invest Co board of directors, were appointed that day. However, the transaction appeared to be a sham, as two days later they all resigned without explanation and were replaced by O.J. Hall Jr. (then-current director of Invest Co), Kenneth Beiriger (director of both Star & Crescent and Invest Co from at least 1977-1983), Stephen Carlstrom (O.J. Hall Jr.'s son), Janet Miles (O.J. Hall Jr.'s wife), Judy Hall (O.J. Hall Jr.'s daughter) and Raleigh Miles (O.J. Hall Jr.'s son-in-law). Star & Crescent Exhibit 17. As the Port District notes, this slate of Star & Crescent directors was nearly identical to Invest Co's board of directors at the time, and its corporate officers (President O.J. Hall Jr., Secretary Leona Jackson, Vice-President K.N. Beiriger) were identical.

O.J. Hall Jr. and his family controlled both Invest Co and Star & Crescent. Hall was on the board of directors of Invest Co at the time he was on the board of Star & Crescent, and also acted as its President. As the Port and City point out, Star & Crescent's own documents establish that; (1) salaries and bonuses for Star & Crescent directors were dictated and approved by Invest Co directors in 1978; (2) Invest Co directors reviewed Star & Crescent's operations and financial statements and set salaries, bonuses and stock dividends for Star & Crescent in 1979 and 1981; (3) Invest Co guaranteed a \$300,000 loan to Star & Crescent in 1981; and (4) Invest Co agreed at its board of directors meeting in 1977 to increase salaries and bonuses for Star & Crescent. Basically, the "asset purchase" transaction between Invest Co and Star & Crescent was a mere continuation of Invest Co's prior business and it carries with it Invest Co's liability for cleanup costs at the Shipyard Sediment Site.

### **There Is No Need To Name Invest Co. To The TCAO At This Time**

The Port District requests that the San Diego Water Board name Invest Co to the TCAO. Because all of the relevant parties, including, but not limited to, Campbell Industries, Inc., Star & Crescent, Invest Co, the Port District and the City, are currently engaged in a federal lawsuit to determine appropriate shares of responsibility for the cost of cleanup under the TCAO should it be adopted, the Cleanup Team does not believe there is a need for the San Diego Water Board to add Invest Co to the CAO as a named discharger at this time. The Cleanup Team believes, based on record evidence, that it is far more likely that Star & Crescent is responsible for the acts and/or omissions of SDMCC and Invest Co under the corporate successor doctrines discussed above. However, theories of corporate succession are highly fact specific and, as here, involve considerable judgment as to the weight of sometimes conflicting evidence. Decisions about corporate succession are best left for determinations by courts, which are more nimble with the legal principles than administrative bodies, and which have defined discovery and trial mechanisms for parties to explore and develop fact-specific analyses. Fortunately, the pending federal litigation provides the San Diego Water Board with something of a “backstop” in this case. In other words, if Invest Co is determined to have a share of responsibility for cleanup costs by the federal court, it can be added to the CAO at that time. In the unlikely event that Star & Crescent is exonerated by the federal court, it can be deleted from the CAO before incurring cleanup costs.

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### **RESPONSE 5.2**

**Comment Submitted By:** Star & Crescent

**DTR Section:** 5

**Comment ID:** 289

**Comment**

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The Port District’s Reference to S&C Boat’s Alleged Insurance Assets is Inaccurate and Improper.

S&C Boat submits this reply comment in response to Designated Party San Diego Unified Port District’s (“Port’s”) Comment No. III (A) (5), which states:

Based on its review of relevant documents, the Port believes that Star & Crescent has millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. Additionally, Star & Crescent has stipulated that it has assets totaling between \$750,000 and \$1 million. [...]

The Port is aware that the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site. [...] Regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site, the identified insurance assets would still apply, so long as the insured entity is named as a discharger under the TCAO and DTR. Thus, if the TCAO and DTR were amended to name all of the potentially liable entities - San Diego Marine Construction Company, Star and Crescent Boat Company and Star & Crescent Investment Co. --

the insurance assets should be available to address directly any established liability, whether or not these entities are still in existence.

(“San Diego Unified Port District’s Submission of Comments, Evidence and Legal Argument,” pp. 10-11 (citations omitted, emphasis added).)

The Water Board must reject the Port’s assertion that certain additional entities be named to the TCAO and DTR purely based upon their potential insurance coverage. Consideration of such facts by the Water Board would be contrary to fact and would violate established legal doctrine regarding the admissibility of such insurance information.

The Water Board is charged with making a determination about whether S&C Boat is a “discharger” responsible for costs associated with remediating or monitoring contamination at the Shipyard Sediment Site. The only relevant inquiry in determining whether a party is a “discharger” is whether there is a basis in law to attach “discharger” or responsible party obligations. For the reasons stated in its May 26, 2011 submission of comments, S&C Boat is not liable because it did not directly contribute to the contamination and is not liable under the law for any contamination caused by any other entities.

Making inquiries and assumptions about whether S&C Boat has insurance proceeds available to pay for remediation of contamination for which it is not liable is inappropriate{ This inquiry is just as inappropriate as, and no more unreasonable than, if the Water Board were asked to consider the status of Wal-Mart’s insurance coverage for the purpose of paying for remediation of the Shipyard Sediment Site. Like Wal-Mart, S&C Boat has no liability for the contamination caused at the Shipyard Sediment Site, and therefore, any question about availability of insurance coverage is both inappropriate and irrelevant. }. Although S&C Boat understands that the possibility of accessing a large insurance policy’s proceeds might seem attractive to the Port and the Water Board, where there is no right to those proceeds, the existence of insurance does not matter. The only proper question is that of legal liability.

#### A. The Port’s Reference to the Existence and Amount of Alleged Insurance Coverage Is Not Factually Supported.

The Port alleges that S&C Boat has “millions of dollars of liability coverage” for remediation and monitoring activities. The Port’s allegations are inaccurate to the extent they attempt to establish that S&C Boat has insurance coverage, or that a certain amount of insurance funds are available to respond to remediation efforts. That statement is not supported by any facts, is wildly speculative, and misleads the Water Board into believing that if it were to assign liability to S&C Boat, there would be ample funds available for cleanup efforts.

At this time, despite diligent efforts, S&C Boat has not obtained any insurance proceeds and, despite tendering claims to numerous insurance carriers, has received no agreement for defense or indemnity from any insurance carrier. Nevertheless, consideration of these facts by the Water Board is inappropriate.

B. Reference to Alleged Insurance Coverage Violates the Rules of Evidence, Is Irrelevant to the Shipyard Sediment Site Matter, and Is Prejudicial to S&C Boat.

Even assuming the Port District's allegations regarding insurance proceeds were true, the Water Board's consideration of this information would violate established legal doctrine regarding the admissibility of such evidence. Further, such evidence is irrelevant to the issue about which the Water Board is responsible for making a determination – the issue of liability. Finally, suggestion that such insurance coverage exists is prejudicial to S&C Boat.

The law is clear that evidence of insurance is inadmissible to prove wrongdoing. The California Evidence Code specifically states that “[e]vidence that a person was, at the time a harm was suffered by another, insured wholly or partially against loss arising from liability for that harm is inadmissible to prove negligence or other wrongdoing.” (Cal. Evid. Code § 1155.)

Further, the question of insurance is irrelevant. Whether S&C Boat has insurance coverage has no bearing whatsoever on the issue before the Water Board - whether S&C Boat is legally responsible for the alleged acts of another corporate entity. The only appropriate inquiry is whether S&C Boat meets the legal requirements for liability, which it does not. The existence or absence of insurance coverage is of no consequence to the matter before the Water Board and is not relevant.

Courts routinely give juries specific instructions on this very issue. The standard rule provided to jurors is: “You must not consider whether any of the parties in this case has insurance. The presence or absence of insurance is totally irrelevant. You must decide this case based only on the law and the evidence.” (Judicial Council of California Civil Jury Instructions (2011), No. 105 (emphasis added).) In this matter, the Water Board is subject to a similar requirement, and must consider only relevant facts and law.

Last, introduction of such evidence is prejudicial to S&C Boat. Discussion of this irrelevant information could improperly encourage the Water Board to make its decision regarding liability based on information having nothing to do with the facts or law regarding liability. Improperly (and inaccurately) suggesting that S&C Boat has the ability to pay for cleanup from insurance proceeds misdirects the Water Board's focus from the only legitimate issue before it – that is, liability – under which its task is to determine whether S&C Boat bears any responsibility for the contamination in the first place.

In a case where a trial court had discussed evidence of an alleged wrongdoer's insurance coverage, a California Court of Appeal reversed the judgment, stating that such evidence is both irrelevant and prejudicial. (*Blake v. E. Thompson Petroleum Repair Co.* (1985) 170 Cal.App.3d 823, 830 (citations omitted).) The courts have made specific findings that the existence of liability insurance is irrelevant to the question of liability. (*Bell v. Bayerische Motoren Werke Aktiengesellschaft* (2010) 181 Cal.App.4th 1108, 1122-1123.) In fact, attempts to introduce such evidence are sometimes considered so inappropriate and such a flagrant violation of the law that they can constitute grounds for attorney misconduct. (*Blake* at 830, citing *Neumann v. Bishop* (1976) 59 Cal.App.3d 451, 469; *Witkin, Cal. Evidence* (2d ed. 1966) § 374, pp. 332-333.)

Evidence regarding alleged insurance coverage has nothing to do with the Water Board's task of determining whether S&C Boat bears liability for the actions of a separate corporate entity. It is inadmissible, irrelevant, and prejudicial, and must be disregarded.

**C. The Port's Suggestion to Name Additional Entities Is Inappropriate and Not Factually Supported.**

The Port District's suggestion that the Water Board should name S&C Boat simply to access insurance proceeds, "regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site" is inappropriate and lacks any factual basis. The Water Code requires a legal determination be made to name a party as a "discharger" in a Cleanup and Abatement Order. Only a person who discharges waste into the waters of the state, creating a condition of pollution or nuisance, is liable under the statutory mandates of the Water Code. (Cal. Water Code Sec. 13304(a).) The Water Code liability is without regard to insurance proceeds.

As documented in S&C Boat's May 26, 2011 submission, there is no evidence that S&C Boat is directly liable for the contamination, or that S&C Boat is the legal successor to any liable party. That should end the inquiry by the Water Board. The availability of insurance (or the lack thereof) is not a valid consideration in making that legal determination.

**Response 5.2**

The commentor correctly notes that the availability of insurance assets alone is not a basis for naming a discharger to a CAO. However, Star & Crescent is named as a discharger in the TCAO because substantial evidence in the record indicates it is the corporate successor of, and responsible for, the acts and omissions of SDMCC and Invest Co.

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## **6. TCAO Finding 6 and DTR Section 6: Campbell Industries**

Finding 6 of TCAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but Campbell Industries denies, that Campbell caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. These wastes contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH. From July 1972 through 1979, Campbell's wholly owned subsidiaries MCCSD and later San Diego Marine Construction Corporation operated a ship repair, alteration, and overhaul facility on what is now the BAE Systems leasehold at the foot of Sampson Street in San Diego. Shipyard operations were conducted at this site by Campbell over San Diego Bay waters or very close to the waterfront. An assortment of waste was generated at the facility including spent abrasive blast waste, paint, rust, petroleum products, marine growth, sanitary waste, and general refuse. Based on these considerations, Campbell is referred to as "Discharger(s)" in this CAO.

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### **RESPONSE 6.1**

**DTR Section:** 6.3.1

**Comment Submitted By:** Campbell

**Comment ID:** 1

#### **Comment**

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San Diego Marine Construction Company (subsequently Star & Crescent) did not sell its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972.

In Finding 6 of the Draft Technical Report, in the first sentence of the second paragraph of Section 6.3.1, it states, "San Diego Marine Construction Company (subsequently Star & Crescent) sold its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972." This statement is incorrect. San Diego Marine Construction Company (subsequently Star & Crescent) sold the business and assets of its Marine Division to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972. The minutes of the first meeting of Directors of MCCSD approving that transaction are attached for inclusion in the administrative record. The purchase did not include the leasehold. San Diego Marine Construction Company surrendered its leasehold to the San Diego Unified Port District (SAR 163149), and the Port District entered into a new lease with MCCSD (SAR 174131).

#### **Response 6.1**

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The commentor is correct. The Finding will be revised as follows: "San Diego Marine Construction Company (subsequently Star & Crescent) sold the business and assets of its Marine Division to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972, as indicated in the minutes of the first meeting of Directors of MCCSD approving that transaction. The purchase did not include the leasehold. San Diego Marine Construction Company surrendered its leasehold to the Port District (SAR 163149), and the Port District entered into a new lease with MCCSD (SAR 174131)." Revisions will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

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## RESPONSE 6.2

**DTR Section:** 6.3.1

**Comment Submitted By:** Campbell

**Comment ID:** 3

**Comment**

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Refusal or failure to respond to State Water Board inquiries is not a basis for naming Campbell Industries as a Discharger.

In Finding 6 of the Draft Technical Report, in the third paragraph of Section 6.3.1, it states, “The stock of Campbell Industries was acquired by Marco Holdings, Inc. (“MARCO”), a Washington corporation, in 1979. Marco Holdings, Inc. is a wholly-owned subsidiary of Marine Construction and Design Company, a Washington Corporation.” In the subsequent paragraph in Section 6.3.1 of Finding 6 in the DTR, it states:

On February 19, 2004 the San Diego Water Board issued Investigative Order R9-2004-0026 directing MARCO to submit a historical site assessment report that completely documented all leasehold information and activities in the vicinity of the BAE Systems leasehold that may have affected water quality, including chemical and waste handling and storage activities, discharges, and monitoring data.

That statement is incorrect. MARCO is defined in the preceding paragraph as Marco Holding, Inc. That company is not mentioned in Investigative Order R9-2004-0026 (SAR 193136). The subsequent paragraph in Section 6.3.1 of Finding 6 in the DTR recites the contents of a letter from H. Allen Fernstrom on behalf of MARCO, now defined as Marine Construction and Design Co. The letter first states that Marine Construction and Design Co. had conducted an internal search and had no records of any operations of its or Campbell Industries operations within the Southwest Marine leasehold. There is no evidence that statement was inaccurate at the time it was written in 2004. Marine Construction and Design Co. has never operated at the Southwest Marine leasehold. Even today Campbell Industries has not located any records of the operations of its subsidiary at the Southwest Marine leasehold. The letter then states that Marine Construction and Design Co. has no California operations or offices. That statement was true then and remains accurate today. It then states that Campbell Industries terminated all California operations in 1999 at Eight Avenue and Harbor Drive (the former Campbell Shipyard), and all available records from California-based operations pertain to that Campbell Shipyard. That statement is also correct. After reciting the contents of this letter, the paragraph ends with the statement, “MARCO was not responsive to the directives of the San Diego Water Board’s Investigative Order and their lack of responsiveness forms part of the basis for the San Diego Water Board’s determination that MARCO should be named as a discharger in the Cleanup and Abatement Order.” This statement is erroneous in four respects. First, MARCO defined as Marco Holdings, Inc. was not under any directive from the San Diego Water Board, as discussed above. Second, MARCO if defined as Marine Construction and Design Co. truthfully responded to the Investigative Order based on the information available to it at the time. Third, Campbell Industries has been an active participant in the mediation proceedings with Timothy Gallagher

which led to the drafting of the pending TACO and DTR, and voluntarily provided most of the evidence of its history at the Site recited in Section 6.3.1. It has not refused or failed to respond to any inquiry by the San Diego Water Board. Finally, the TCAO and DTR do not name MARCO (however defined) as a Discharger in the Cleanup and Abatement Order. Paragraphs 4 and 5 in Section 6.3.1 should be deleted. Not only are portions of these paragraphs inaccurate, but there is no basis or need for the San Diego Water Board to use refusal or failure to respond as a factor in naming Campbell Industries as a Discharger in the Cleanup and Abatement Order.

**Response 6.2**

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While Resolution No. 92-49 states that "[r]efusal or failure to respond to Regional Water Board inquires[.]" is considered relevant evidence to support whether a person should be required to clean up waste and abate the effects of a discharge (section I A(10)), since Marine Construction and Design Co. (MARCO) is not named as a discharger in the TCAO, its failure to respond to San Diego Water Board inquires, whether accurate or not, is not relevant evidence. As the Commentor also notes, Campbell (a named discharger) has responded to San Diego Water Board inquiries. Accordingly, paragraphs 4 and 5 of section 6.3.1 of the DTR will be deleted. These revisions will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

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## **7. TCAO Finding 7 and DTR Section 7: Chevron, A Subsidiary of Chevron/Texaco**

Finding 7 of TCAO No. R9-2011-0001 states:

Chevron, a subsidiary of ChevronTexaco (hereinafter, Chevron) owns and operates the Chevron Terminal, a bulk fuel storage facility currently located at 2351 East Harbor Drive in the City of San Diego adjacent to the NASSCO and BAE Systems leaseholds. Fuel products containing petroleum hydrocarbons have been stored at the Chevron Terminal since the early 1900s at both the currently operating 7 million gallon product capacity upper tank farm and the closed 5 million gallon capacity lower tank farm. Based on the information that the San Diego Water Board has reviewed to date, there is insufficient evidence to find that discharges from the Chevron Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, Chevron is not referred to as “Discharger(s)” in this CAO.

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The San Diego Water Board did not receive any comments regarding Finding 7 and DTR Section 7.

## **8. TCAO Finding 8 and DTR Section 8: BP as the Parent Company and Successor to Atlantic Richfield Company**

Finding 8 of TCAO No. R9-2011-0001 states:

BP owns and operates the Atlantic Richfield Company (ARCO) Terminal, a bulk fuel storage facility with approximately 9 million gallons of capacity located at 2295 East Harbor Drive in the City of San Diego. Fuel products containing petroleum hydrocarbons and related constituents such as PAHs have been stored at ARCO Terminal since the early 1900s. ARCO owned and operated ancillary facilities include a wharf, fuel pier (currently BAE Systems Pier 4), and a marine fueling station used for loading and unloading petroleum products and fueling from 1925 to 1978, and five pipelines connecting the terminal to the pier and wharf in use from 1925 to 1978. Storm water flows from ARCO Terminal enter a City of San Diego MS4 storm drain that terminates in San Diego Bay in the Shipyard Sediment Site approximately 300 feet south of the Sampson Street extension. Based on the information that the San Diego Water Board has reviewed to date, there is insufficient evidence to find that discharges from the ARCO Terminal contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, which create, or threaten to create, conditions of pollution or nuisance. Accordingly, BP and ARCO are not referred to as “Discharger(s)” in this CAO.

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The San Diego Water Board did not receive any comments regarding Finding 8 and DTR Section 8.

## **9. TCAO Finding 9 and DTR Section 9: San Diego Gas and Electric, A Subsidiary of Sempra Energy Company**

Finding 9 of TCAO No. R9-2011-0001 states:

SDG&E owned and operated the Silver Gate Power Plant along the north side of the BAE Systems leasehold from approximately 1943 to the 1990s. SDG&E utilized an easement to San Diego Bay along BAE Systems' north property boundary for the intake and discharge of cooling water via concrete tunnels at flow rates ranging from 120 to 180 million gallons per day. SDG&E operations included discharging waste to holding ponds above the tunnels near the Shipyard Sediment Site.

The San Diego Water Board alleges, but SDG&E denies, that it has caused or permitted waste (including metals [chromium, copper, lead, nickel, and zinc], PCBs, PAHs, and total petroleum hydrocarbons [TPH-d and TPH-h]) to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. Based on these considerations SDG&E is referred to as "Discharger(s)" in this CAO.

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### **RESPONSE 9.1**

**DTR Section:** 9

**Comments Submitted By:** SDG&E, BAE Systems, City of San Diego

**Comment IDs:** 285, 451, 460, 495

#### **Comment**

SDG&E submitted a request for rescindment of discharger designation. BAE Systems Inc. and the City of San Diego submitted rebuttal comments on the request for rescindment. These comments are summarized below.

SDG&E commented that the Cleanup Team's recommendation to name SDG&E as a "person responsible" and Discharger under the TCAO is based on wholly unsubstantiated and speculative allegations, and entirely devoid of reasonable, substantial or credible evidence as required under California Water Code section 13304.

SDG&E owned and operated the Silver Gate Power Plant adjacent to the north side of the present-day BAE Shipyard beginning in the early 1940s. The SDG&E power plant facility operated continuously through 1974, and intermittently thereafter with minimal operations (and associated cooling water circulation) after 1983. The adjacent substation facility operated until 2005. Decommissioning of the power plant facility began in 1994, with power plant and substation closure and demolition thereafter completed by 2007.' The Regional Board generally alleges that SDG&E caused or permitted waste discharges from the Silver Gate Power Plant facilities into San Diego Bay and "created, or threatened to create, a condition of pollution or nuisance." (DTR § 9, at 9-1.) Based on these allegations, which SDG&E denies in their entirety, the Regional Board has designated SDG&E as a "Discharger" in the TCAO. There is no evidence that discharges from the Silver Gate Power Plant facilities contributed to the accumulation of pollutants in marine sediments at the Site to levels which create; or threaten to

create, conditions of pollution or nuisance.<sup>6</sup> Consequently, in so naming SDG&E, Regional Board staff has abused its discretion and acted unreasonably, inappropriately and erroneously by:

- (i) basing its findings and conclusions in Sections 9 of the TCAO and DTR on pure speculation and conjecture;
- (ii) failing to engage in any meaningful evaluation of extensive exculpatory evidence submitted by SDG&E;
- (iii) failing to engage in any meaningful evaluation of the most likely (and readily-identifiable) sources of sediment impacts among the alleged Dischargers, and
- (iv) relying on biased, unsubstantiated information provided by other responsible parties seeking to implicate SDG&E as an additional Discharger.

For the foregoing reasons, and those set forth below, SDG&E requests that the Regional Board rescind its status as a "person responsible" and "Discharger" under the final Cleanup and Abatement Order for the Site.

BAE rebuttal comments regarding SDG&E's request stating the following:

The Regional Board was correct to designate SDG&E as a discharger and, for the foregoing reasons, and the reasons set forth in more detail below, the Regional Board should deny the Rescindment Request.

SDG&E's Rescindment Request is based on two central arguments, neither of which have any merit. First, SDG&E claims that the Cleanup Team relied on "speculative" allegations in reaching its conclusion. There is nothing "speculative" about the evidence. The Silver Gate Power Plant was constructed in the 1940s and 1950s. It was a steam turbine power plant that operated at peak capacity for over thirty years. There were many sources of polychlorinated biphenyls ("PCBs"), copper, and mercury within equipment located throughout the plant. This equipment leaked and, along with other waste water, was discharged to the San Diego Bay ("Bay") via the cooling water tunnels, storm water run-off, and SDG&E's tidelands disposal ponds and oil/water separators. This is confirmed by the Administrative Record, deposition testimony of members of the Cleanup Team, data and documents prepared by SDG&E and its own consultants, and additional documents either produced by SDG&E and other parties in the pending United States District Court case or otherwise publicly available (which are filed herewith, augmenting the Administrative Record).

Second, SDG&E argues that the Cleanup Team "ignored the obvious." That is, "BAE" is solely responsible for the contamination found on the Northern portion of the Shipyard Sediment Site. In making this argument, SDG&E fails to distinguish between BAE Systems and previous, distinct, shipyard entities that operated at the Northern portion of the Shipyard Sediment Site since 1914. BAE Systems only operated at the Shipyard Sediment Site since 1979 and has no responsibility for the discharges which occurred during the prior 65 years by other owners and operators that have no relationship to BAE Systems. Further, it is not appropriate for the Regional Board to allocate liability through these proceedings {SDG&E uses the Rescindment Request to argue that the Regional Board should allocate liability to BAE Systems by conflating it with prior owners and operators and by identifying evidence that it believes supports its

position. As noted above, rather than refute every instance in the Rescindment Request, BAE Systems generally objects to the singular definition of “BAE” to include prior owners and operators. Further, BAE Systems generally, and in connection with the pending litigation, reserves its rights relative to the allegations and evidence cited in the Rescindment Request. The focus of this Response is on SDG&E’s status as a discharger, rather than on BAE Systems’ status as a discharger}. Finally, SDG&E relies on an expert opinion from ENVIRON that TBT should be a cleanup “driver.” This opinion, however, is wrong and untimely under the relevant discovery order and should be excluded{ BAE has filed herewith a Motion to Exclude ENVIRON’S Technical Comments submitted by SDG&E.}.

The Regional Board was correct to designate SDG&E as a discharger and, for the foregoing reasons, and the reasons set forth in more detail below, the Regional Board should deny the Rescindment Request. The Regional Board applied the proper legal standard in designating SDG&E as a discharger. The Regional Board designation of SDG&E as a discharger is supported by substantial, reasonable, and credible evidence.

The City of San Diego commented that SDG&E is appropriately named as a discharger.

- a. There is sufficient evidence to show that PCBs were released from the SDG&E Silvergate substation/switchyard area and that the conditions at this substation/switchyard led to the subsequent discharge of PCBs into the storm drain in Sampson Street and, ultimately, to the Shipyard Site and San Diego Bay.
- b. There is sufficient evidence to show that SDG&E discharged PCBs to the Shipyard Site and San Diego Bay via the cooling tunnels.
- c. The PCBs detected in catch basin cb1 is further evidence that SDG&E had discharged PCBs to the Sampson Street storm drain and subsequently to the shipyards sediment site and San Diego Bay.
- d. There is sufficient evidence to show that the SDG&E Silvergate power plant bilge pumping system through Nobles Lake discharged PCBs and other wastes to the Shipyard Site and San Diego Bay.

In conclusion, the evidence shows:

- PCBs were a component in oils within the Power Plant.
- Oils spilled within the boiler room side of the power plant were intentionally pumped to an oil/water separator called “Nobles Lake”
- Nobles Lake discharged oily waste to the Shipyards Sediment site and San Diego Bay, at a minimum, via a ditch observable in numerous aerial photos, and possibly via a discharge pipe.
- Aroclor ratios found in Shipyard sediments reflect the different types of wastes that were discharged from Nobles Lake and from the substation/switchyard.



The investigations conducted by SDG&E and their consultants to date have not adequately characterized the discharges or residual contamination left from these operations and do not refute the evidence showing the discharge of PCBs to the Site. The Aroclor mix in the Shipyard sediment site reflect the conceptual site model of the different waste types produced by SDG&E and their discharge locations and transport pathways.

## **Response 9.1**

### **Introduction, Summary Of Comments And Recommendation**

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SDG&E argues that there is no substantial evidence in the record to support naming it as a discharger under the TCAO. The City and BAE Systems argue that there is. Reduced to its essence, SDG&E's claim is that there is no substantial evidence to support a finding that it made **any contribution whatsoever** to the condition of pollution or nuisance that currently exists at the Shipyard Sediment Site. SDG&E readily admits that large quantities of PCBs and other COCs were used at its Silver Gate facility from approximately 1943 through 1984, but claims there is no evidence that any of those PCBs ever made it to San Diego Bay during this over-forty-year period. **Because substantial record evidence demonstrates that PCBs and other relevant COCs were discharged by SDG&E directly to San Diego Bay through its cooling tunnels, were discharged to land at its switchyard where they were washed to San Diego Bay through the MS4 System, and were discharged to open pits in close proximity to the Bay where they overflowed to the Bay and were, at one time, conveyed from one pit directly to the Bay through a trench, SDG&E must remain a named discharger under the TCAO.**

### **Legal Standard**

All commentors and the Cleanup Team agree that there must be substantial evidence in the record to support naming SDG&E as a discharger. As California's Supreme Court observed, substantial evidence is evidence of "ponderable legal significance," which is "reasonable in nature, credible and of solid value." *Ofsevit v. Trustees of California State Universities and Colleges* (1978) 21 Cal.3d 763, 773, n. 9.) "Substantial evidence" means facts, reasonable assumptions based on facts and expert opinions supported by facts. *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4<sup>th</sup> 1004, 1019. Importantly, an agency may also rely on the opinion of its staff in reaching decisions, and "the opinion of staff has been recognized as constituting substantial evidence." *Browning-Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866 citing *Coastal Southwest Dev. Corp. v. California Coastal Zone Conservation Com.* (1976) 55 Cal.App.3d 525, 535-536.

SDG&E accurately cites the substantial evidence standard at the beginning of its Request for Rescindment but, as detailed below and documented by the City and BAE Systems in their comments, utterly fails to faithfully apply it to the "facts, reasonable assumptions based on facts and expert opinions supported by facts" in the record in the remainder of its Request.

State Water Board Resolution No. 92-49 further animates the types of evidence that may be considered substantial when naming dischargers in a CAO, including direct or circumstantial evidence. (Resolution No. 92-49, § II A.) Such direct or circumstantial evidence includes

“[i]ndustry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills and clarifiers.” *Id.*, at § II A(4). With respect to evidence of discharges from SDG&E, “industry-wide operational practices” would be those in effect in or about 1940 through 1984. As detailed below, there is substantial evidence in the record that industry-wide operational practices at steam turbine power plants such as SDG&E’s Silver Gate routinely resulted in leaks of dielectric fluids containing PCBs varying from half a pound to sixty-four pounds from valves and seals on transformers.

Tellingly, as BAE Systems notes in its comments, SDG&E consistently misstates the deposition testimony of Cleanup Team members Barker and Carlisle, among others, and fails to note the objections of counsel, many of which qualify the deponents responses. An oft used tactic by counsel for SDG&E was to create a tautological hypothetical for a Cleanup Team member and then ask for a response. Valid “incomplete hypothetical” and “calls for speculation” objections were asserted. SDG&E attempts to leverage these Cleanup Team deposition responses into an argument that the Cleanup Team essentially agrees that BAE Systems and earlier operators at the northern portion of the Shipyard Sediment Site were 100 percent responsible for the creation of the condition of pollution or nuisance there. The Cleanup Team does not.

Even assuming solely *arguendo* that all of the deposition responses cited by SDG&E are true and faithful recitations of the deponents’ testimony, which they are clearly not, SDG&E’s argument still fails. SDG&E’s attempt to divert attention from itself by casting aspersions towards other dischargers fails because there is substantial evidence in the record that SDG&E made at least some contribution to the condition of pollution or nuisance at the Shipyard Sediment Site. Its argument that BAE Systems and the previous operators at its leasehold contributed mightily to the condition of pollution or nuisance is, at bottom, simply one about allocation. As counsel for SDG&E, Jill A. Tracy notes in SDG&E’s June 23, 2011 Rebuttal, which primarily addresses the need to name the Port as a discharger, “the state and regional boards are precluded from apportioning responsibility for remedial activities under a CAO.” 6/23/11 SDG&E Rebuttal, pp. 10-11. Ms. Tracy argues that if the San Diego Water Board were to rescind its designation of the Port as a named discharger under the TCAO, it would “become engaged in a *de facto* allocation of harm.” *Id.* The same *de facto* allocation of harm would occur if the San Diego Water Board agreed to rescind its designation of SDG&E as a discharger.

Moreover, SDG&E will have its opportunity to prove that its contribution to the condition of pollution or nuisance was negligible or de minimus in the currently-pending federal litigation specifically filed for the purpose of establishing an allocation of liability for cleanup costs under the TCAO. To rescind SDG&E’s designation as a discharger now, even assuming it has made a showing that its responsibility is relatively minor, would go against State Water Board precedent. *See eg. In re County of San Diego, City of National City et al.*; State Water Resources Control Board Order No WQ 96-2, *cited with approval* by SDG&E in its 6/23/11 Rebuttal.

**The Source Of Substantial Evidence – Even If Its Another Discharger – Does Not Make It Less Substantial**

SDG&E agrees that State Water Board precedent requires substantial evidence to support naming a party responsible under a CAO. *See* SDG&E Request for Rescindment, p. 6, lines 7-12 (6:7-12) *citing In the Matter of the Petition of Exxon Company USA et al.*, WQO No 85-7, p. 12 (*Exxon*). What SDG&E fails to note is that *Exxon* requires Regional Water Boards to name “all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility.” *Exxon, supra*, at 11. In light of the Porter-Cologne’s declared objective and the broad discretion granted to Regional Water Boards to issue CAOs under Water Code section 13304, State Water Board decisions suggest that a Regional Water Board should look at evidence with a view toward finding liability. To do otherwise would hinder their statutory mission to protect and enhance water quality.

SDG&E repeatedly attempts to malign the Cleanup Team by arguing that the record evidence is somehow less substantial because it has been gathered, in some cases, from the City and/or BAE Systems. *See* SDG&E Request for Rescindment, 1:14-16, 5:3-6, 16:16-19, 31:15-20. SDG&E’s attempts to divert attention from its own discharges must fail. The record evidence of its responsibility for contributing to the condition of pollution or nuisance at the Shipyard Sediment Site is substantial, and it is made no less so by the efforts of the City and/or BAE Systems to bring it to the Cleanup Team’s attention.

### **Substantial Evidence Establishes SDG&E Discharged Relevant COCs To San Diego Bay Through Its Cooling Water Tunnel**

SDG&E admits it discharged copper and other metals at levels exceeding California Toxics Rule (CTR) levels from at least 1990 through 1994, after the plant had been shut down for several years. SDG&E Request for Rescindment, 8:19-22.<sup>1</sup> SDG&E then goes on to argue that the discharge of these constituents to San Diego Bay do not implicate it as a responsible party because CTR levels cannot be used as a basis to impose liability retroactively. But this is simply a red herring. The relevant evidentiary fact is SDG&E discharged copper and other metals to San Diego Bay directly from its cooling tunnels from 1990 through 1994.

SDG&E further admits that its cooling tunnel solids contained PCBs, HPAHs, copper and mercury. SDG&E Request for Rescindment, 10:2-6. It goes on to argue that shipyard operations, including the marine railways, are a source of COCs, and that because concentration levels of relevant COCs found in the cooling tunnel solids were comparatively low, it cannot be a contributing source to the condition of pollution or nuisance at the Shipyard Sediment Site. SDG&E’s argument that the shipyard operations are the sole source of COCs at the Shipyard Sediment Site ignores the relevant facts – PCBs, HPAHs, copper and mercury were all detected in the cooling tunnel solids. Even if taken as completely accurate, SDG&E’s argument is not exculpatory, but, rather, simply indicates it may have a small share of responsibility relative to the shipyards. Stated somewhat differently, this argument is not about responsibility, but is about allocation.

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<sup>1</sup> SDG&E notes that the discharges did not violate its then-applicable NPDES permit. The Cleanup Team expresses no opinion about this assertion by SDG&E. However, SDG&E’s argument is misplaced. The TCAO alleges that SDG&E’s discharges contributed to a condition of pollution or nuisance at the Shipyard Sediment Site, which is an independent basis from permit violations for establishing responsibility for a cleanup under Water Code section 13304.

PCBs, HPAHs and copper are primary COCs impairing beneficial uses and driving the cleanup under the TCAO. Data gathered from the cooling tunnel outfalls (substantial evidence) establishes that SDG&E discharged copper directly to the San Diego Bay from 1990 through 1994. Data gathered from solids inside the cooling tunnels (substantial evidence) establishes that SDG&E discharged PCBs, HPAHs, copper and mercury directly to San Diego Bay. The Cleanup Team also believes it is reasonable to assume, based on these documented facts (substantial evidence), that during periods of peak operation from 1940 through 1984, even greater amounts of PCBs, HPAHs, copper, mercury and other metals were discharged by SDG&E through its cooling tunnels to San Diego Bay, where they accumulated and contributed to the current condition of pollution or nuisance at the Shipyard Sediment Site.

BAE System's Response to SDG&E's Request for Rescindment also contains overwhelming substantial evidence that SDG&E discharged PCBs through its cooling tunnels to San Diego Bay, and that SDG&E is responsible for at least some portion of the cleanup. Documentation of the kinds of equipment and historical activities at SDG&E's Silver Gate, when viewed in the light of industry-wide operational practices that are proven to have historically led to discharges of PCBs from steam turbine power plants constitute substantial evidence of SDG&E's discharges. *See e.g.*, Resolution 92, 49, §§ I A(1), (4); BAE Systems Response to SDG&E Request for Rescindment, pp. 4:14 – 6:13; 8:12 – 12:13. All of BAE Systems citations to historical documents and evidence of SDG&E's Silver Gate Power Plant components and operational practices, as well as its citations to documents and evidence establishing industry-wide practices with respect to power plants and the components and equipment thereof, are incorporated by reference in support of the summaries below as if set forth in full.

- **SDG&E Used Large Quantities Of PCBs At Silver Gate.** Large transformers existed at Silver Gate. Transformers contained PCBs from the 1950s through 1979 during Silver Gate's years of peak operation. Transformers containing PCBs were found at Silver Gate as late as April, 1997. According to the U.S. EPA, leaks of dielectric fluids containing PCBs from valves and seals on transformers were common, and leaks and spills varied in size from half a pound to sixty-four pounds of dielectric fluid.
- **SDG&E Commonly Spilled PCBs To The Turbine Room Floor And Routed Them To The San Diego Bay Through Its Cooling Tunnels.** PCBs were also commonly used in coolant oil, turbine lubricating oil and hydraulic fluids at steam generation plants from the 1940s through the late 1970s, during Silver Gate's years of peak operation. The turbine side of Silver Gate had eight turbine lubricating oil tanks with a capacity of 2,500 to 3,000 gallons each. According to industry documents and U.S. EPA documents, leaks and disposal of these types of fluids were common as the systems were only partially closed, and these fluids were rarely re-used. All leaks from the transformers, turbines, turbine lubricating tanks and any hydraulic equipment at Silver Gate collected in the trenches of the turbine side of the power plant and, for over 30 years before SDG&E installed a wastewater treatment facility in 1977, were discharged via the discharge cooling water tunnels directly to San Diego Bay. *See Exponent Comments on 13267 Responses (September 29, 2004)(SAR156879-156889); ENV America, Technical Report*

for RWQCB Investigation Order No. R9-2004-0026 (July 14, 2004) (SAR193272-193329).

- **Environmental Investigations By SDG&E Confirm PCBs, Copper And Mercury Were Discharged Through SDG&E's Cooling Tunnels.** Periodic environmental investigations at the Silver Gate Power Plant, which consistently resulted in the detection of PCBs, copper, and mercury further demonstrate that SDG&E discharged PCBs, copper and mercury via the cooling water discharge tunnel. In 2005, SDG&E's consultants reviewed and summarized a prior Phase I and Phase II from Silver Gate from 2001, and concluded that the plant trench system, sumps, voids and cooling water tunnels contained metals and PCBs. Later sampling in 2006 by SDG&E's and the Port District's consultants confirmed that PCBs and copper were present in the cooling tunnels above reporting limits at all sampling locations, and mercury exceeded reporting limits in 3 of the 4 samples. In 2010, two of the three samples collected from the Silver Gate cooling discharge tunnel by consultants contained PCBs above the method detection limits, and copper and mercury above the reporting limits. The PCB Aroclors detected in the cooling tunnels were the same as the PCB Aroclors found in the tideland soils in the location of the former wastewater ponds and oil/water separators, the same as those found in the soil in the SDG&E switchyard area, the same as those found in transformer dielectric fluids in the transformers at Silver Gate. Moreover, the PCB Aroclors found in the cooling tunnel were detected in approximately the same ratio as those found in samples taken directly outside the tunnel and in the area of the Shipyard Sediment Site that was influenced by the tunnel outflow. The nearly identical ratio of co-occurrence of the Aroclors in the cooling water tunnel sediment samples and the San Diego Bay sediments influenced by the tunnel outfall indicates that the PCBs in the sediments had a common source -- the SDG&E discharge cooling water tunnel.

**Substantial Evidence Establishes SDG&E Discharged Relevant COCs To Land At the Switchyard Area Of Its Facility Where They Were Conveyed By The MS4 System To San Diego Bay.**

SDG&E admits that it discharged PCBs to soil at the switchyard area where it removed three 200,000 gallon underground storage tanks (USTs). SDG&E Request, 7:13-20. All of the samples contained PCBs, and SDG&E further admits that 11 of the 18 samples taken at the switchyard in 2006 contained PCBs in soil in excess of 1,000 ug/kg, with the hottest sample taken at 125,000 micrograms per kilogram. SDG&E Request, 11:2-24. Despite the fact that the Silver Gate Power Plant is located 10 to 30 feet upgradient from and only 900 feet from the San Diego Bay, SDG&E argues there is no possibility the PCBs found at very high concentrations at shallow depths in the switchyard soil could have made it to the Bay. SDG&E Request 12:2-3. But the argument not only defies the logic that "water flows downhill," it is belied by SDG&E's admission that "storm water runoff from the Silver Gate substation (switchyard) would have flowed from the substation to the gutter on the northwest side of Sampson Street[.]" SDG&E Request, 14:18-20. This gutter joins the 30-inch storm drain which eventually discharges at SW04, which is within the Shipyard Sediment Site. It is reasonable to assume based on the forgoing facts (substantial evidence) that PCBs admittedly discharged to soils in SDG&Es

switchyard, where storm water admittedly carried soils to the Sampson Street storm drain outlet that drains to the San Diego Bay, made their way to San Diego Bay.<sup>2</sup>

BAE Systems Response to SDG&E's Request for Rescindment also contains overwhelming substantial evidence that SDG&E discharged PCBs from its switchyard area through the MS4 system to the Shipyard Sediment Site, and that SDG&E is responsible for at least some portion of the cleanup. Documentation of the kinds of equipment and historical activities at SDG&E's switchyard, when viewed in the light of industry-wide operational practices that are proven to have led to discharges of PCBs historically from the types of equipment used at the switchyard constitute substantial evidence of SDG&E's discharges. *See e.g.*, Resolution 92, 49, §§ I A(1), (4); BAE Systems Response to SDG&E Request for Rescindment, pp. 4:14 – 6:13; 12:14 – 18:19. All of BAE Systems citations to historical documents and evidence of SDG&E's switchyard components and operational practices, as well as its citations to documents and evidence establishing industry-wide practices with respect to the equipment used at the switchyard, are incorporated by reference in support of the summaries below as if set forth in full.

- **SDG&E Discharged Substantial Quantities Of PCBs To Soils At The Switchyard.** SDG&E's switchyard had seventy-five oil circuit breakers and transformers containing dielectric fluid, which ordinarily contained PCB Aroclors 1254 and 1260 from the 1940s through the late 1970s. The transformers at SDG&E's switchyard held up to 6,000 gallons of the PCB-containing dielectric fluid, while the oil circuit breakers held up to 600 gallons. Transformers and circuit breakers of this type commonly leaked their PCB-containing dielectric fluids, and approximately ten percent of the dielectric fluids sold were to replace those that had leaked or spilled. SDG&E's own Daily PCB Inspection Reports confirmed leakage was common at the switchyard and, perhaps most importantly, SDG&E took no action to clean up the leaks or spills. The evidence of discharges of large volumes of PCB-containing dielectric fluids at SDG&E's switchyard is overwhelming.
- **SDG&E Did Not Adequately Contain PCB Leaks And Spills At The Switchyard.** SDG&E argues all of its PCB leaks were contained within a "sophisticated, multifaceted containment structure[. SDG&E Request 13:16-18. While creative, this argument wholly lacks factual merit. In 1987, U.S. EPA's Inspection Report of the switchyard area documented deficient containment, including: (1) inadequate roof and walls to prevent rain water from reaching stored PCBs; (2) inadequate floor with a minimum six inch high curb to provide containment of a volume at least twice the internal volume of the largest stored container; (3) there are floor openings that would permit liquids to flow from the curbed area; (4) floors and curbing that are not constructed of smooth and impervious materials; and (5) spilled or leaked materials are not immediately cleaned up. U.S.

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<sup>2</sup> SDG&E argues throughout its Request that PCBs and other COCs it discharged to the Bay are in such small amounts that they could not have caused the condition of pollution or nuisance by themselves. *See e.g.s.* Request, 10:2-7, 15:2-5, 19:4-13, 20:7-9. This is not a defense to liability under the TCAO. The argument amounts to an admission that SDG&E *contributed* to the condition of pollution or nuisance by adding COCs that caused impairment to beneficial uses to San Diego Bay, even if some other discharger added more COCs to the Bay than it did. SDG&E's arguments are relevant to an allocation – not to whether it is properly named as a responsible party.

EPA's Inspection Report confirms that leaked and spilled PCBs in the switchyard were not adequately contained to prevent storm water run-off from carrying the PCBs to the storm drain system and then to the MS4 storm drain outfall, and directly contradicts SDG&E's claim that the switchyard containment system was a "sophisticated, multifaceted containment structure." Not surprisingly, samples gathered in the vicinity of SW04 contained the highest concentrations of PCB Aroclors 1254 and 1260 – the same Aroclors detected at high levels in the switchyard soils. Based on these facts, it is virtually impossible not to make the reasonable assumption (substantial evidence) that PCBs discharged by SDG&E made their way through the MS4 system to the Shipyard Sediment Site where they contributed to the condition of pollution or nuisance that exists there.

- **PCBs Detected At CB-1 Are Most Likely Attributable To SDG&E.** SDG&E argues that none of the PCBs detected at CB-1 can be attributed to it. SDG&E Request, pp. 14:7-23, 16:4-15. Ultimately, SDG&E's argument fails. CB-1 contained Aroclors 1260 and 1254, detected commonly throughout SDG&E's facilities. The six-inch lateral draining to CB-1 came from the turbine roof of Generating Unit 1 at Silver Gate, where subsequent investigation by SDG&E confirmed the presence of PCBs. During Silver Gate's peak operating years, PCBs were commonly found in various building materials, including paints, sealing and caulking compounds, cement and plaster additives, sealing liquids and fire retardants. PCBs in these building components are known to readily enter the environment. After entering CB-1, storm water runoff and the pollutants it collected from the Silver Gate roof went to the 30-inch culvert beneath Sampson Street and then to the SW04 outfall within the Shipyard Sediment Site. It is certainly reasonable to assume, based on these facts (substantial evidence), that the source of PCBs on SDG&E's power plant roof, and then in CB-1, is SDG&E, rather than some other, more remote source as SDG&E speculates.

### **Substantial Evidence Indicates SDG&E Discharged Relevant COCs To A Series Of Open Waste Pits At Its Tidelands Lease Area Where They Spilled Or Were Routed Through A Trench To San Diego Bay.**

SDG&E admits soil data from one of the open waste pits in its tidelands lease area known as "Pond B" tested positive for COCs, including copper, PAHs and PCBs. SDG&E Request, 18:22-25. SDG&E further admits that PCBs persist in the soils today, over 25 years after the facility was closed. SDG&E Request, 19:4-13. Despite the documented presence of PCBs in soils in close proximity to the San Diego Bay, SDG&E argues that its waste pits are not a source of PCBs or other COCs at the Shipyard Sediment Site. SDG&E Request, 20:19-22. In order to make the argument, SDG&E engages in some revisionist history. SDG&E admits that its consultant stated in response to the San Diego Water Board's section 13267 Investigative Order (under penalty of law) that "[s]ome water from the pond discharged to the Bay[,]" but takes the Cleanup Team to task for allegedly "ignoring" a subsequent statement by the consultant that he did not really mean it. SDG&E Request, 20:12-14, n. 7. The Cleanup Team simply chose to place more weight on the contemporaneous statement made by the consultant at the time his report was finalized and made under penalty of law in response to a formal order. It properly chose to discount the "correction" he later submitted when commenting on the 2005 Tentative

Cleanup and Abatement Order at the request of SDG&E. Moreover, internal SDG&E correspondence authored in 1974 corroborates SDG&E's consultants initial statement about discharges. The waste pit is referred to as Nobles Lake, which is described as being in an "overflowing condition" and warning is given that "discharge from Silver Gate will eventually find a path to the San Diego Bay." The record not only establishes that these open, unlined waste pits overflowed to the Bay, but also that a trench from one of the pits conveyed wastes directly to the Bay.

BAE Systems Response to SDG&E's Request for Rescindment also contains overwhelming substantial evidence that SDG&E discharged copper, PCBs, and other COCs to its open, unlined waste pits in the tidelands area of its leasehold that were, in turn, discharged to the Shipyard Sediment Site, and that SDG&E is responsible for at least some portion of the cleanup. Documentation of the kinds of equipment and historical activities at SDG&E's boiler room and tidelands lease area, when viewed in the light of industry-wide operational practices constitute substantial evidence of SDG&E's discharges. *See e.g.*, Resolution No. 92-49, §§ I A(1), (4); BAE Systems Response to SDG&E Request for Rescindment, pp. 4:14 – 6:13; 18:20 – 24:6.<sup>3</sup> All of BAE Systems citations to historical documents and evidence of SDG&E's investigations of the open, unlined waste pits, as well as its citations to documents and evidence establishing industry-wide practices with respect to the boiler room equipment and operating procedures, are incorporated by reference in support of the summaries below as if set forth in full.

- **SDG&E Boiler Blowdown Contained COCs And Was Discharged To Open, Unlined Waste Pits In Its Tidelands Leasehold.** Maintenance protocols required the Silver Gate boilers to be cleaned using specific chemical cleaning products. The resultant waste contained dissolved metals such as iron, copper (one of the primary COCs in the TCAO), chromium, and nickel. Untreated boiler blowdown, bilge water on the boiler side of the plant and wastes from boiler cleaning collected in the trenches on the floor of the boiler side of the plant, were pumped to and/or disposed of in four unlined ponds or oil/water separators located on SDG&E's tidelands leasehold from 1950 through 1974. Aerial photographs of the area leased by SDG&E on the tidelands demonstrate that SDG&E began disposing of wastes in ponds and oil/water separators in 1950 and continued this practice until at least 1974. Both the trenches on the boiler room floor and the waste pits tested positive for PCBs (Aroclors 1254 and 1260), copper and mercury.
- **SDG&E's Waste Pits Were In Close Proximity To The Bay And Overflowed Or Discharged To The Bay Through A Trench.** Not only did SDG&E's consultant state under penalty of law that the waste pits overflowed, but also there is a letter dated May 1, 1950 in the record stating that SDG&E operated a trench from one of the ponds that extended to the edge of the tidelands to facilitate the discharge of SDG&E's stored wastes directly to the Bay. Internal SDG&E documents discuss "Nobles Lake," an oil/water settling pond located on the tidelands that received waste from the turbine room

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<sup>3</sup> These sections of BAE Systems comments also detail a number of SDG&E's mischaracterizations of testimony given by members of the Cleanup Team at their depositions. While the Cleanup Team does not belabor these points in this response since it is simply a summary of the substantial evidence that supports naming SDG&E to the TCAO, which stands on its own, irrespective of the deposition testimony, we adopt BAE Systems statements clarifying the deposition testimony.



and boiler room sump pumps. The correspondence notes that Nobles Lake “is filled to the brim and is at least 11 feet deep with a mixture of oil and earth” and that in its present overflowing condition a discharge will eventually find its way to the Bay. It is also reasonable to conclude that September 10, 1974 was not the first time that SDG&E’s use of Nobles Lake created an overflowing condition and eventual discharge path to the Bay. In fact, photographs of Nobles Lake from 1955, also included as attachments to the ENV America July 14, 2004 Site Assessment Report, show that Nobles Lake had become filled to the brim in the past, and that SDG&E’s solution was to remove water and sludge and dump it onto the ground adjacent to Nobles Lake where it likely ran into the Bay or was washed into the Bay by storm water run off. Further, a May 1, 1950 letter from Walter Zitlau, an engineer at the Silver Gate Power Plant who later became President of SDG&E, states that the “water disposal lake on the tidelands has been overflowing, and a ditch has been cut to the water’s edge,” which would permit “oil [to] be admitted to the bay.” Aerial photographs from 1950 clearly show the trench that Mr. Zitlau refers to in his letter extending from the pond all the way to the edge of the tidelands and into the Bay.

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## **10. TCAO Finding 10 and DTR Section 10: United States Navy**

Finding 10 of CAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but the United States Navy (hereinafter “U.S. Navy”) denies, that the U.S. Navy caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. The U.S. Navy owns and operates a municipal separate storm sewer system (MS4) at Naval Base San Diego (NBSD), formerly Naval Station San Diego or NAVSTA, through which it has caused or permitted the discharge of waste commonly found in urban runoff to Chollas Creek and San Diego Bay, including excessive concentrations of copper, lead, and zinc in violation of waste discharge requirements. Technical reports by the U.S. Navy and others indicate that Chollas Creek outflows during storm events convey elevated sediment and urban runoff chemical pollutant loading and its associated toxicity up to 1.2 kilometers into San Diego Bay over an area including the Shipyard Sediment Site.

The San Diego Water Board alleges, but the U.S. Navy denies, that the U.S. Navy has caused or permitted marine sediment and associated waste to be resuspended into the water column as a result of shear forces generated by the thrust of propellers during ship movements at NBSD. The resuspended sediment and pollutants can be transported by tidal currents and deposited in other parts of San Diego Bay, including the Shipyard Sediment Site. The above discharges have contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site to levels that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay.

Also, from 1921 to the present, the U.S. Navy has provided shore support and pier-side berthing services to U.S. Pacific fleet vessels at NBSD located at 3445 Surface Navy Boulevard in the City of San Diego. NBSD currently occupies 1,029 acres of land and 326 water acres adjacent to San Diego Bay to the west, and Chollas Creek to the north near Pier 1. Between 1938 and 1956, the NBSD leasehold included a parcel of land within the Shipyard Sediment Site referred to as the 28th Street Shore Boat Landing Station, located at the south end of the present day NASSCO leasehold at the foot of 28th Street and including the 28th Street Pier. The San Diego Water Board alleges, but the U.S. Navy denies, that the U.S. Navy caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance at this location when it conducted operations similar in scope to a small boatyard, including solvent cleaning and degreasing of vessel parts and surfaces, abrasive blasting and scraping for paint removal and surface preparations, metal plating, and surface finishing and painting. Prevailing industry-wide boatyard operational practices employed during the 1930s through the 1980s were often not sufficient to adequately control or prevent pollutant discharges, and often led to excessive discharges of pollutants and accumulation of pollutants in marine sediment in San Diego Bay. The types of pollutants found in elevated concentrations at the Shipyard Sediment Site (metals, butyltin species, PCBs, PCTs, PAHs, and TPH) are associated with the characteristics of the waste the U.S. Navy operations generated at the 28th Street Shore Boat Landing Station site. Based on the preceding considerations, the U.S. Navy is referred to as “Discharger(s)” in this CAO.

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## RESPONSE 10.1

### DTR Section: 10

**Comment Submitted By:** U.S. Navy

**Comment IDs:** 2, 4, 5, 6, 7, 8, 9, 10, 478

### Comment

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ID 478

The San Diego Water Board's allegation that significant contaminants from Naval Base San Diego migrated to the Shipyard Sediment Site, either through discharges to Chollas Creek, resuspension of sediments through propeller wash, or via tidal currents is unfounded.

ID 2

Ten IRP sites were identified in the CAO; nine of these sites were also identified in the Complaint. The potential for historical releases from four of the sites (IRP Sites 8, 9, 10, and 12) to San Diego Bay is low, and it is unlikely that these sites ever had a detectable impact on bay sediments. Historical transport pathways from six of the sites (IRP Sites 1, 2, 3, 4, 7, and 13) did exist or may have existed, although there is little direct evidence in bay sediments that is indicative of releases from these sites. Discharges to the bay from these sites would have declined over time due to cessation of site activities, improved environmental practices, and completion of remedial actions. Five of the sites (IRP Sites 7, 8, 9, 12, and 13) have been closed with no further action, with regulatory agency concurrence.

ID 4

Multiple dredging events from the 1940s through 2003 have removed sediments that accumulated in three areas of San Diego Bay adjacent to the IRP sites and in the main navigational channel between NBSD and the Shipyard Sediment Site, reducing the likelihood of potential impacts of any historical releases from IRP sites as well as the availability of COCs for potential resuspension and transport.

ID 5

At NBSD, COC concentrations in surface sediment in the three areas adjacent to the IRP sites tend to be higher closer to shore and lower outside the pier heads and in the main channel. At the Shipyard Sediment Site, COC concentrations in surface sediment also decrease with increasing distance from the shoreline. These concentration gradient patterns are consistent with the presence of separate, localized source areas at NBSD and the Shipyard Sediment Site and are not consistent with the transport of COCs from NBSD to the Shipyard Sediment Site. There are no reasonable physical or chemical mechanisms that can scientifically explain these chemical gradient patterns other than the existence of localized source areas at each site.

ID 6

Average COC concentrations in the three areas of San Diego Bay adjacent to the IRP sites are lower than average concentrations within the proposed remediation footprint at the Shipyard Sediment Site. In addition, COC concentrations in subsurface sediments adjacent to the IRP sites do not appear to be substantially higher than those in surface sediments. Based on the existing data reviewed for the site, there are no reasonable physical or chemical mechanisms that can scientifically explain higher chemical concentrations at a distant site that exceed the original source concentration.

ID 7

Because of its prevalent use as an antifouling coating on commercial ships and its lack of use on Navy ships, TBT is a strong, site-specific indicator of Shipyard Sediment Site releases. TBT concentrations in sediments adjacent to NBSD are about an order of magnitude lower than concentrations found at the Shipyard Sediment Site. Other Shipyard Sediment Site COCs, including arsenic, cadmium, copper, lead, zinc, and PCBs, are significantly correlated with TBT in sediments at the Shipyard Sediment Site. This correlation is consistent with co-occurring sources within the Shipyard Sediment Site and inconsistent with a significant source from NBSD.

ID 8

PCB fingerprinting of sediments at the Shipyard Sediment Site is consistent with the presence of two distinct, localized sources of PCBs. If these PCBs were derived from activities at NBSD, the signatures would be similar. The spatial distribution of PCBs at the Shipyard Sediment Site is consistent with the presence of two different sources, with concentrations found at the north end of the site higher than those at the south end.

ID 9

A modeling simulation was performed specifically to evaluate the claim that sediments adjacent to IRP sites may have been resuspended by propeller wash, transported to the Shipyard Sediment Site by tidal currents, and redeposited within the Shipyard Sediment Site. The modeling results indicate that net deposition to the Shipyard Sediment Site proposed remediation footprint due to resuspension and transport from areas adjacent to IRP sites at NBSD was between 0.17 percent and 0.37 percent of the total annual deposition, an amount that is negligible in the overall deposition of sediments at the Shipyard Sediment Site.

ID 10

Collectively, these lines of evidence indicate that the overall contribution of Installation Restoration Program (IRP) sites to contamination at the Shipyard Sediment Site is negligible.

**Response 10.1**

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In general, the arguments put forth in the U.S. Navy's comment go to allocation of responsibility based on the level of significance of the Navy's contribution to contamination at the Shipyard Sediment Site. The comments do not, however, provide evidence that would exculpate the Navy from responsibility. Water Code section 13304 does not establish a discharge threshold below which a party cannot be ordered to cleanup and abate the affects of an unauthorized discharge of waste. Furthermore, the DTR does not make findings on the level of significance of the Navy's contribution to contamination at the Shipyard Sediment Site. Thus, the TCAO properly finds that the Navy caused or permitted a discharge of waste that contributed to the impairment of sediment quality-related beneficial uses in the Shipyard Sediment site. More detailed responses to the Navy's comments are provided below.

ID 2.

The Navy's statement that "the potential for historical releases from four of the sites (IRP Sites 8, 9, 10, and 12) at Naval Base San Diego to San Diego Bay is low" is not accurate. Soil samples

taken at IRP Sites 8 and 12 located adjacent to San Diego Bay were found to contain TPH, metals, SVOCs, and PAHs. Based on the contaminants detected in soil and proximity of the sites to the bay, historic releases from IRP Sites 8 and 12 could have affected San Diego Bay. The comment is correct that the potential for impacts from IRP Sites 9 and 10 to San Diego Bay are low based on the proximity of the sites to San Diego Bay (greater than 500 feet ).

The comment is correct that historical transport pathways from six of the sites (IRP Sites 1, 2, 3, 4, 7, and 13) did exist or may have existed. The majority of these sites with the exception of IRP Site 7 are adjacent to either San Diego Bay or Paleta Creek. The San Diego Water Board's Department of Defense case files and related documents contained in the Shipyard Sediment administrative record show that some of these sites previously had exposed soil which could have been eroded into surface waters or a migration pathway for contaminants in groundwater to the bay. Groundwater elevations at the sites range from mean sea level (MSL) near the shoreline to a few feet above MSL near the east side of base. In addition, the Site Management Plan for the base identified hydraulic communication to San Diego Bay in the vicinity of IRP Site 1. Therefore, a high likelihood exists that IRP Sites 1, 2, 3, 4, 7, 8, 12, and 13 have, or may have, contributed to bay sediment contamination based on proximity of these sites to the bay, contaminants of concern detected at the sites, and past site management practices.

#### ID 4

Dredging events from the 1940s through 2003 likely did remove sediment derived from Navy sources from San Diego Bay. These events, however, were not conducted for environmental cleanups. Rather they were maintenance dredging projects designed to improve navigation. Thus, these dredging events likely did not remove all sediment derived from Navy sources. Additionally, the San Diego Water Board is not aware of any source control measures taken by the Navy since 2003 to eliminate sediment discharges from its sources to San Diego Bay.

#### ID 5

The existence of concentration gradients do suggest separate, localized sources of contaminated sediment at Naval Base San Diego and the Shipyard Sediment Site. The gradients, however, do not rule out the mobilization of sediment from Naval Base San Diego and redeposition at the Shipyard Sediment Site. As pointed out in NASSCO's rebuttal comment (Comment ID 374) sources in the Chollas Creek area may not be the largest sources of copper and zinc to the Shipyard Sediment Site, but they are still a source.

#### ID 6

Concentrations at the Shipyard Sediment Site are consistent with contributions of sediment from Navy sources. The DTR does not claim that the Navy is the only source and does not make findings on the level significance of Navy sources. Further, NASSCO points out in its rebuttal comment (Comment ID 374) that the Navy's concentration gradient study shows transport and deposition of silt and clay, the most important size fraction with respect to COC transport, in the Shipyard Sediment Site.

#### ID 7

The Navy concludes that the correlation of TBT with other COCs in sediment at the Shipyard Sediment Site are inconsistent with a significant source from Naval Base San Diego. As pointed

out previously, the DTR does not make findings on the level of significance of the Navy's contribution to the contamination at the site.

ID 8

The Navy concludes that the PCB fingerprinting data also indicate two localized sources of PCBs at the Shipyard Sediment Site. As discussed in the response to Comment ID 5 above, this conclusion does not rule out mobilization of PCB contaminated sediment from Naval Base San Diego and redeposition at the Shipyard Sediment Site.

ID 9

The Navy concludes that the deposition in the remediation footprint is negligible from resuspension and transport of sediment from propeller wash and tidal currents. Again, this argument doesn't exonerate the Navy and only addresses one potential transport pathway from Naval Base San Diego to the Shipyard Sediment Site.

ID 10

The Navy's conclusion that the overall contribution from Navy sources to the Shipyard Sediment Site is negligible is not relevant to whether or not it bears responsibility for the contamination. The DTR and TCAO did not make findings regarding the level of significance of the Navy's contribution to the contaminated sediment problem at the Shipyard Sediment Site.

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## RESPONSE 10.2

**DTR Sections:** 10.4.2, 10.6, 10.10

**Comments Submitted By:** U.S. Navy, NASSCO

**Comment IDs:** 375, 479

### **Comment**

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ID 479

The U.S. Navy commented that the San Diego Water Board's allegation that historical Navy operations at the 28th Street Mole Pier contributed to the contamination at the Shipyard Sediment Site is unfounded, and the U.S. Navy's 2004 comment submission on this subject incorrectly assumed that shipyard operations were part of the U.S. Navy leasehold. No documentation was found to support the allegation of U.S. Navy industrial use of the area currently leased by NASSCO. U.S. Navy use in this area appears to have been limited to temporary housing in two areas during the 1940s and operation of small landings, first on the north side of the 28th Street Mole Pier (near its western terminus) and later on the south side near the base (eastern end) of the pier. A summary of the U.S. Navy's use of the 28th Street pier is given below, with a comprehensive review provided in Appendix A to this comment submission.

#### TEMPORARY HOUSING EAST OF 28TH STREET MOLE PIER.

East of the 28th Street Mole Pier, in an area east of 28th Street and south of Belt Street, temporary officers quarters were used by the Navy on leased City of San Diego property from approximately 1941 through 1946, in the area known as Parcel 1. During approximately 1941 and 1942 a Temporary Defense Housing Camp occupied a parcel located southwest of the intersection of Belt Street and 28th Street. Industrial development in both these areas appears to have taken place after Navy use had ended.

#### 28TH STREET SHORE BOAT LANDING FACILITY.

The Navy operated a 28th Street Shore Boat Landing facility on the north side of the 28th Street Mole Pier from approximately 1939 through 1956. This facility, located near the western terminus of the 28th Street Mole Pier, consisted of a storage room, a waiting room, and a finger pier and floating docks used by ship launches to ferry sailors to and from Navy ships moored in San Diego Bay (Navy 2004). Non-Navy industrial activities on 28th Street Mole Pier during this time period included a shipbuilding and maintenance facility located partly on a wooden wharf extending along the north face of the 28th Street Mole Pier and partly on the shore north of the base (eastern end) of the pier. By 1946, Lynch Shipbuilding Company was operating the facility, and by 1956, National Marine Terminal Incorporated was operating it. Industrial operations shown for this facility include machine, woodworking, pattern, electric, and welding shops; a foundry; and a mold loft.

#### SMALL CRAFT LANDING, SOUTHERN END OF 28TH STREET

In 1956, a permit was granted to the Navy for use of a parcel located east of the 28th Street Mole Pier, at the southern end of 28th Street, apparently as a replacement for the loss of the Shore Boat Landing facility on the north side of the 28th Street Mole Pier. A small landing can be seen in this area in aerial photos from 1964, 1974, and 1978. No other Navy activities were seen in this parcel. Industrial development of the parcel appears to have occurred after Navy use had ended.

#### ID 375

NASSCO rebutted this comment with the following information and allegations. The Historical Document Review submitted by the Navy does not provide any evidence that the Navy's activities at the NASSCO leasehold did not result in discharges of contaminants of concern to the Site. The principle finding in the Historical Document Review is that "[t]he 2004 Navy Technical Report (Navy 2004) had previously associated many of the activities in the shipbuilding area with the Navy operated 28th Street Shore Boat Landing facility. However, this review indicates that these facilities were operated by the Lynch Shipbuilding Company and later by National Marine Terminal Incorporated." Navy Comments, Appendix A, Navy Historical Document Review, at 5-1.

Yet this conclusion does not contradict the findings in the DTR, which states that the "U.S. Navy concluded that the industrial activities it conducted on NASSCO's present day leasehold were limited to maintenance of small boat launches," and that the "U.S. Navy acknowledged the possibility that discharges from their boat launch maintenance operations on the north side of 28th Street Pier to the Shipyard Sediment Site may have occurred." DTR at 10-12. This is so because the Navy does not dispute that it operated a small boat launch facility at 28th Street, and the Historical Document Review does not present any evidence that contradicts the DTR's finding that discharges from those operations to the Shipyard Sediment Site may have occurred.

The Navy Apportionment Report also includes an analysis of the contribution of the Navy's facilities at 28th Street. The Navy presents historical evidence to clarify the extent of Navy facilities at that time. However, faced with a general lack of data, the Navy falls back to estimating its contribution from 28th Street based on the surface areas and periods of operation of the BAE, NASSCO, and 28th Street. The surface areas and periods of operation were

multiplied by the Navy to obtain acre-years for each facility and then calculate the percentage of the total acre-years for each facility, which becomes the allocation that each facility.

This approach is completely irrelevant to contaminants in sediments near 28th Street because it presumes that all storm water-related COCs, derived from surface runoff, from the entire surfaces of the BAE and NASSCO facilities contributed to the small area near 28th Street (near the two sediment core locations), which they did not. Even if this were appropriate, the Navy biases the result further by limiting its area of contribution to just 28th Street (one acre) and disregarding the area of the rest of the NBSD. Finally, consideration of storm water runoff only from surfaces ignores inputs from historical point sources that were likely much more significant before implementation of both federal and state clean water point source permitting programs under the Clean Water Act and Porter-Cologne Act. Accordingly, the Navy's conclusion regarding its historical contribution from 28th Street is not credible and should not be considered. Attachment B, Apportionment Critique, at 3.

### **Response 10.2**

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As NASSCO rebuttal comments point out, the U.S. Navy's comment confirms the San Diego Water Board's allegations in the DTR that the Navy operated the former 28th Street Shore Boat Landing Station from 1936 through 1956. Based on circumstantial evidence, the DTR concluded that a reasonable assumption was that BMPs employed by the U.S. Navy at the 28th Street Shore Boat Landing Station during the years of operation were not adequate to prevent discharges to San Diego Bay (p. 10-14). The U.S. Navy provided no information to counter the DTR's conclusion. Accordingly no changes to TCAO Finding 10 or DTR 10.4.2 regarding discharges from the Navy operated former 28<sup>th</sup> Street Shore Boat Landing Station are warranted.

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## **11. TCAO Finding 11 and DTR Section 11: San Diego Unified Port District**

Finding 11 of CAO No. R9-2011-0001 states:

The San Diego Water Board alleges, but the Port District denies, that the Port District caused or permitted wastes to be discharged or to be deposited where they were discharged into San Diego Bay and created, or threatened to create, a condition of pollution or nuisance. The Port District is a special government entity, created in 1962 by the San Diego Unified Port District Act, California Harbors and Navigation Code Appendix I, in order to manage San Diego Harbor, and administer certain public lands along San Diego Bay. The Port District holds and manages as trust property on behalf of the People of the State of California the land occupied by NASSCO, BAE Systems, and the cooling water tunnels for SDG&E's former Silver Gate Power Plant. The Port District is also the trustee of the land formerly occupied by the Star & Crescent Boat Company and its predecessor, and by Campbell Industries at all times since 1963 during which they conducted shipbuilding and repair activities.<sup>1</sup> The Port District's own ordinances, which date back to 1963, prohibit the deposit or discharge of any chemicals or waste to the tidelands or San Diego Bay and make it unlawful to discharge pollutants in non-storm water directly or indirectly into the storm water conveyance system. The San Diego Water Board has the discretion to name the Port District in its capacity as the State's trustee as a "discharger" in the Shipyard Sediment Site CAO and hereby does so, consistent with its responsibility for the actions, omissions and operations of its tenants and to the extent indicated by previous State Water Board and San Diego Water Board orders

The wastes the Port District caused or permitted to be discharged, or to be deposited where they were discharged into San Diego Bay through its ownership of the Shipyard Sediment Site contained metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), butyl tin species, PCBs, PCTs, PAHs, and TPH.

The Port District also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit. The San Diego Water Board alleges, but the Port District denies, that the Port District has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs).

The urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives

for toxic pollutants in San Diego Bay. Based on these considerations the San Diego Unified Port District is referred to as “Discharger(s)” in this CAO.

<sup>1</sup> Star & Crescent Boat Company and Campbell Industries owned and operated ship repair and construction facilities in past years prior to BAE Systems San Diego Ship Repair, Inc.’s occupation of the leasehold. See Sections 5 and 6 of the Technical Report.

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### **RESPONSE 11.1**

**Comments Submitted By:** Port District, City of San Diego

**DTR Section:** 11

**Comment IDs:** 13, 15, 20, 21, 22, 24, 26, 27, 28, 29, 286, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449

**Comment**

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ID 13

Port Support During the TCAO/DTR Process

The Port also reiterates its willingness to provide appropriate support to the Regional Board in its efforts to implement the TCAO and DTR. The Port was instrumental in coordinating initial efforts to get the dischargers and interested parties into discussions and mediation to try to reach a consensus on remedial approach and scope. The Port has worked to locate and leverage dischargers' potentially applicable insurance policies that could assist in funding the remediation. The Port also made its experts available to the CUT to assist in the site assessment.

The Port remains committed to supporting the Regional Board in any appropriate manner afforded by law. The Port will continue to be engaged in any appropriate mediation process, to reach a resolution of any remediation and monitoring issues. Likewise, the Port is working with the CUT and supporting its efforts through the California Environmental Quality Act (CEQA) process. The Port is further working with the CUT to explore options for potential disposal or dewatering sites for the dredged sediment.

ID 15

Past and Present Port Support and Cooperation with the Regional Board

The Port is dedicated to protecting and improving the environmental conditions of San Diego Bay and the Port tidelands. The Board of Port Commissioners is committed to conducting Port operations and managing resources in an environmentally sensitive and responsible manner and ensuring that tenant operations do the same.

The Port was created by the State Legislature in 1962 to manage San Diego Bay and surrounding tidelands by balancing economic benefits, community services, environmental stewardship, and public safety. (California Harbors and Navigation Code, App. 1 [the Port Act].) The Port takes seriously its authority and responsibility to protect, preserve, and enhance San Diego Bay's physical access; natural resources, including plant and animal life; and water quality. (Port Act, §4(b).)

The Port has adopted as its mission statement the commitment to protecting the tideland resources through balancing economic benefits, community services, environmental stewardship, and public safety on behalf of the citizens of California. To this end, the Port has developed strategic goals to protect and improve the environmental conditions of San Diego Bay and surrounding tidelands. The Port currently has several programs in place to protect storm water, reduce pollutant sources, improve air quality, and reduce air emissions. For example, the Port has established an environmental committee with the goal of promoting environmental improvement projects throughout the San Diego Bay beyond ordinary compliance obligations. (Exhibit " 1 " [Gibson Deposition], 56:12-57:14.) Such Port programs have positively impacted water quality in bays and harbors throughout the state.

To the extent the CUT would designate the Port as a primary discharger because of perceived non-cooperation grounded in the Port's withdrawal from a voluntary mediation process that it suggested, such a position would be an inappropriate basis for Port primary liability as a matter of law. On the contrary, the Port's commitment to the above principles is reflected its long history of cooperating with the Regional Board in efforts to remediate sites at which the Port is a landlord, some of which are listed below.

#### 1. Campbell Shipyard

The Port provided significant assistance and leadership at another large San Diego Bay dredging project, the Campbell Shipyard site. At that site, the Port worked cooperatively with and supported the Regional Board's cleanup approach. (See, Exhibit " 1 " [Gibson Deposition], 28:12-24; 48:18-49:9; Exhibit "5" [Barker Deposition], Vol. III, 539:11-25.) The Port assisted in pushing the site toward mediation and assisted in securing insurance proceeds from a number of dischargers as well as its own insurance. These funds were used to finance the dredging and capping of the impacted sediments. Ultimately, the Port performed the sediment dredging and capping work. (Exhibit "6" [Carlisle Deposition], Vol. I, 119:2-6.)

#### 2. Shelter Island Yacht Basin TMDLs

The Regional Board has been implementing copper TMDLs at the Shelter Island Yacht Basin. As David Barker acknowledged in his deposition, the Port "is working very cooperatively with the [Regional Board]" on this matter. (Exhibit "5" [Barker Deposition], Vol. III, 543:2-8.)

In particular, the Port has been working at phasing out copper-based hull paint and "taking a lead role in investigating the use of alternative vessel hull paints to curtail copper discharges into the [San Diego Bay]." (Exhibit "5" [Barker Deposition], Vol. III, 544:25-545:6.) The Port has sought grant funds to assist in the switching of hull paints and has been facilitating a discussion on this point between the Regional Board, the yacht owners and the marinas. (Exhibit "5" [Gibson Deposition], 31:20-32:15; Exhibit "5" [Barker Deposition], Vol. III, 545:7-10.) The Port has also made financial contributions to this effort. ((Exhibit " 1 " [Gibson Deposition], 32:

16-23.)

### 3. Teledyne Ryan/Convair Lagoon

The Port has worked cooperatively with the Regional Board at the Teledyne Ryan (TDY) and Convair Lagoon sites. These sites involve a former aeronautical facility that had landside contamination impacts (the TDY site) and San Diego Bay sediment contamination impacts (the Convair Lagoon site). Again, the Port is working cooperatively with the Regional Board at this site. (Exhibit "5" [Barker Deposition], Vol. III, 540:11-20.) In fact, the Port assisted in bringing historic specialized insurance assets to help pay for demolition and remediation costs on the TDY site. Further, the Port worked aggressively with Regional Board oversight to remediate the sediment in the Convair Lagoon.

### 4. South Bay Power Plant

The South Bay Power Plant is a complex decommissioning and demolition project related to a power plant facility. There are related environmental issues associated with this work, including issues relating to San Diego Bay sediment. The Port has been cooperative while working with the Regional Board at the South Bay Power Plant site. (Exhibit " 1 " [Gibson Deposition], 30:18-31:8.) The Port is also working with other responsible agencies and parties through a very complex process to implement the demolition and related processes.

### 5. Former BFGoodrich South Campus

BFGoodrich is a site involving investigation and remediation in an area adjacent to the San Diego Bay. The Port is working with the Regional Board in investigating potential areas of historic contamination, including sediment contamination.

### 6. Tow Basin

The Tow Basin is an area adjacent to the San Diego Bay involving PCB contamination associated with a former aeronautics facility. The Port has been working cooperatively with the Regional Board to conduct the necessary investigation and remedial work pursuant to the Sediment Quality Objectives.

### ID 20

The Port Should Not be Primarily Responsible for its Tenants' Discharges

The DTR states that the Port may be named as a discharger due to its capacity as landlord of certain tenants identified as dischargers but also recognizes that "[i]n certain situations, the State Water Board has found it appropriate to consider a lessee primarily responsible and the lessor secondarily responsible for compliance with a cleanup and abatement order." (DTR, § 11.2, at p. 11 -4.) As the DTR further notes, while this determination requires an analysis of various factors, the general rule is "that a landowner or lessor

party may be placed in a position of secondary liability where it did not cause or permit the activity that lead to the initial discharge into the environment and there is a primarily responsible party who is performing the cleanup." (Id) The Port agrees with the DTR's statements of the law in this regard.

While the DTR goes on to correctly note that "there is no evidence in the record that the Port District initiated or contributed to the actual discharge of waste to the Shipyard Sediment Site" it incorrectly concludes that "it is ... appropriate to name the Port District as a discharger in the CAO to the extent the Port's tenants, past and present, have insufficient financial resources to cleanup [sic] the Shipyard Sediment Site and/or fail to comply with the order." (DTR §11.2, at p. 11-4 [citing In the Matter of Petitions of Wenwest, Inc. et al., WQ 92-13, p. 9; In the Matter of Petitions of Arthur Spitzer, et al, WQ 89-8, p. 21.]

The DTR acknowledges that "[i]n the event the Port District's tenants, past and present, have sufficient financial resources to clean up the Shipyard Sediment Site and comply with the Order, then the San Diego Water Board may modify its status to secondarily responsible party in the future." (DTR §11.2, at pp. 11-4 to 11-5.) This anticipated modification is appropriate and should be implemented because there is substantial evidence of the Port District's tenants' abilities to fund the Order. In the same fashion, the evidence illustrates that the Port District's tenants are complying with the Order.

ID 21

#### The Port's Tenants Have Sufficient Assets to Conduct the Cleanup

The Port's tenants have more than sufficient assets to conduct the cleanup. In fact, prior iterations of the TCAO did not name the Port as a primary discharger because of its determination that the Port's tenants had adequate assets to conduct the cleanup and were cooperating. (SAR 375780, at 375818-375819.) Inexplicably, the latest draft of the TCAO reaches a contrary conclusion without presenting any new facts that would justify this change in position. Having acknowledged the correct legal analysis for determining whether the Port should be primarily or secondarily liable, the CUT bears an initial burden of establishing through evidence the facts necessary to conclude that the Port's tenants do not have adequate assets to fund the cleanup efforts. Yet, no such evidence has ever been presented.

In fact, the evidence establishes beyond question that the Port's tenants have adequate assets to fund the cleanup efforts. The DTR estimates the remedial cleanup and monitoring costs will total \$58.1 million. (DTR §32.7.1, at p. 32-40.) During the discovery period, the Port sought and received responses from its tenants confirming that the tenants have adequate assets, whether in the form of traditional financial assets or insurance assets, to perform the cleanup. As detailed below, the Port's current and historic tenants have more than adequate financial and insurance assets - at least \$800 million. This is exclusive of the available financial and insurance assets of other dischargers such as the Navy and the City of San Diego.

Additionally, the Port's tenants have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability. (See, e.g., SAR 159273, 159289 at paragraph 21 [NASSCO Lease]; Exhibit "7" [SDG&E Tidelands Use and Occupancy Permit Excerpt], p. 5, paragraph 10; SAR 159307, 159324 at paragraph 20 [Southwest Marine Lease]; Exhibit "8" [Southwest Marine Lease Amendment No. 4 Changing Name to BAE Systems San Diego Ship Repair, Inc.].) Consequently, the tenants' significant assets would be applicable to the Port's responsibility for any alleged "orphan shares" under these indemnity agreements. There is, therefore, no basis to conclude that the Port's tenants will be unable to cover the costs of remediation.

#### 1. BAE

During the administrative discovery process, BAE stipulated that "it has the financial assets to cover any amounts of the cleanup and remedial monitoring under [the TCAO] which are premised upon BAE's established liability for the time period 1979 to the present with respect to the BAE leasehold only and that are ultimately allocated to BAE." (Exhibit "9" [BAE Stipulation].) Based on its review of BAE's insurance documents, the Port believes BAE has tens of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "10" [Summary of BAE Historic Liability Insurance].)

#### 2. NASSCO

During the administrative discovery process, NASSCO stipulated that "it has the financial assets to cover the amount of the [TCAO] that are ultimately allocated to NASSCO." (Exhibit "11" [NASSCO Stipulation].) Additionally, based on its review of relevant documents, the Port believes that NASSCO has hundreds of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "12" [Summary of NASSCO Historic Liability Insurance].)

#### 3. SDG&E

During the administrative discovery process, SDG&E produced documentation of its insurance profile. Based on its review of these and other relevant documents, the Port believes that SDG&E has hundreds of millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "13" [Summary of SDG&E Historic Liability Insurance].)

#### 4. Campbell

During the administrative discovery process, Campbell produced documents regarding its insurance profile. Based on its review of these and other relevant documents, the Port

believes that Campbell has tens of millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "14" [Summary of Campbell Historic Liability Insurance].)

#### 5. Star & Crescent Boat Company

Based on its review of relevant documents, the Port believes that Star & Crescent has millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "15" [Summary of Star & Crescent Boat Company Historic Liability Insurance].) Additionally, Star & Crescent has stipulated that it has assets totaling between \$750,000 and \$1 million. (Exhibit "16" [Star & Crescent Stipulation].) Given Star & Crescent's likely limited share of liability for the Shipyard Sediment Site in comparison to the other dischargers, the combination of insurance and financial assets eliminate any likelihood that there will be any "orphan share" assigned to the Port.

The Port is aware that the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site. However, this dispute does not present the risk of significant "orphan share" liability that could potentially be assigned to the Port. Regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site, the identified insurance assets would still apply, so long as the insured entity is named as a discharger under the TCAO and DTR. Thus, if the TCAO and DTR were amended to name all of the potentially liable entities - San Diego Marine Construction Company, Star and Crescent Boat Company and Star & Crescent Investment Co. — the insurance assets should be available to address directly any established liability, whether or not these entities are still in existence. (See, California Insurance Code §11580(b)(2).)

ID 22

#### The Port's Tenants Are Cooperative

In addition to possessing more than adequate financial assets to conduct the remediation, the Port's tenants are currently cooperating with the Regional Board. Although the tenants have been proposing a remedial approach that differs in some respects from the remedial approach proposed by the CUT, the process is "proceeding cooperatively." (Exhibit "5" [Barker Deposition], Vol. III, 489:20-490:14.)

#### IV. There is no Evidence of Port Non-Cooperation

In contrast to the extensive evidence provided above regarding the Port's history of prior cooperation with the Regional Board in achieving remediation of numerous environmental challenges throughout the San Diego Bay area and cooperation with the Regional Board in the specific context of this matter, the CUT has contended in its

administrative discovery responses that the Port was named as a discharger because it has not cooperated with the CUT during this process.

The Port notes that the allegation of non-cooperation is not contained in the TCAO or DTR. This absence confirms that, at least as of the date of the most recent TCAO and DTR, no issue regarding the Port's cooperation existed. In fact, the concern regarding Port cooperation is not grounded in fact. When asked to identify the basis for the allegations of non-cooperation, the witnesses testified to concerns that the Port was not supporting the remedial footprint and was not going to produce witnesses to confirm this support. (Exhibit "5" [Barker Deposition], Vol. III, 520:7-21, 521:23-522:24; Exhibit "1" [Gibson Deposition], 33:9-22.) As detailed above, the Port has produced expert witnesses to support the remedial footprint. Likewise, the witnesses testified that the Port had not been supportive of efforts to locate a site for dewatering or disposal of the dredged sediments. (Exhibit "5" [Barker Deposition], Vol. III, 523:4-21.) Again, as noted above, the Port is working with the CUT to explore solutions to this issue and is working to provide appropriate support in the CEQA process. (See, Exhibit "5" [Barker Deposition], Vol. III, 527:23-529:6.)

The only other basis for the allegation of non-cooperation was the Port's decision to withdraw from the mediation process. (Exhibit "1" [Gibson Deposition], 33:9-34:10, 44:5-13; Exhibit "6" [Carlisle Deposition], 110:20-23.) However, as noted, the Port's withdrawal from a voluntary mediation process that it initially proposed is an inappropriate basis for naming the Port as a primary discharger, as a matter of law. Further, any implication that the mediation withdrawal constitutes Port non-cooperation or opposition to the TCAO process is directly rebutted by the Port's cooperation cited above. In sum, the Port has provided and continues to provide appropriate cooperation during the TCAO process.

#### ID 24

##### The Port Has not Discharged Contamination from its MS4 Facilities

As a secondary basis for Port designation, the TCAO and DTR allege that the Port should be named as a discharger based upon its ownership and operation of MS4 facilities that have purportedly discharged contamination. Specifically, the TCAO and DTR allege that MS4 facilities owned or operated by the Port have discharged through the SW4 and SW9 outfalls and minor storm drains. However, the evidence in the record does not support this basis for Port discharger liability.

#### ID 26

##### The Port Does not Own or Operate SW4 or SW9

The DTR states that the Port "operates the following MS4 storm drains which convey urban runoff from source areas up-gradient of the Shipyard Sediment Site's property and discharge directly or indirectly into San Diego Bay within the NASSCO and BAE Systems leasehold: ... Storm Drain SW4; Storm Drain SW9." (DTR §11.3.1, at pp. 11-5 to 11-7.) Elsewhere, the DTR alleges that the Port has discharged pollutants 'through its



SW4 ... and SW9 MS4 conduit pipes, as well as other minor drains on its tidelands property and watershed." (DTR §11.4, at p. 11-8.)

These statements are incorrect. The Port does not own or operate the SW4 or SW9 outfall or the MS4 facilities leading to these outfalls. Rather, as the CUT has acknowledged in its administrative discovery responses, both outfalls (SW4 and SW9) and related MS4 facilities are operated by the City under an easement, (Exhibit "17" [CUT Discovery Responses Excerpts], Responses to Special Interrogatories 28, 30.) The City has similarly acknowledged that its "storm drain system enters the NASSCO leasehold at the foot to 28\* Street and terminates at the southeasterly comer" where it "discharges into Chollas Creek" at the SW9 outfall. (See, SAR 158787, 158971, 158806 [2004 City Storm Water Pollution Prevention Program Report].) The City has an easement for the MS4 facilities that terminate at the SW4 outfall. (Exhibit "18" [City Easement].) Moreover, the City retained easements for "all water, sewer and drainage facilities, known or unknown" located within the tidelands when the City first conveyed the tidelands in trust to the Port. (Exhibit "19" [Conveyance].) Because there is no evidence the Port has ever owned or operated SW4 and SW9 or the MS4 facilities that lead directly to these outfalls, the Port cannot be held liable for discharges from this portion of the MS4. (Exhibit "20" paragraph 7 [Collacott Declaration].)

The Cleanup Team's administrative discovery responses clarify that the TCAO and DTR "do not allege that the Port District manages or operates the portion of the City of San Diego's MS4 that drains to" SW4 and SW9. (Exhibit "17" [CUT Discovery Responses Excerpts], Responses to Special Interrogatories Nos. 28, 30.) Rather, the contention is that the Port "is responsible for controlling pollutants into and from its own MS4 system" and that "the Port District cannot passively allow pollutants to be discharged through its MS4 and into another Copermittees' MS4s, like the City of San Diego." (Id [emphasis added].) Yet, neither the DTR nor the administrative discovery responses identify what part of the MS4 owned or operated by the Port would ultimately lead to SW4 or SW9, much less how such MS4 facilities have discharged pollutants to SW4 or SW9.

ID 27

There is no Evidence that the Port's MS4 Facilities are Discharging Pollutants to the San Diego Bay

The DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination.

ID 28

There is no Evidence that SW4 and SW9 are Discharging Contaminants to the Shipyard Sediment Site

The TCAO and DTR fail to provide evidentiary support for the conclusion that SW4 and SW9 have discharged contaminants to San Diego Bay and the Shipyard Sediment Site. In fact, the DTR acknowledges that "no monitoring data is available" for either SW4 or

SW9. (DTR §§11.6.4, at p. 11-13 [SW4]; 11.6.5, at p. 11-15 [SW9].) In lieu of actual monitoring results, the DTR simply concludes that "it is highly probable that historical and current discharges from th[ese] outfalls have discharged" various contaminants. (Id.) Reliance upon assumption rather than evidence as a basis for liability is legally unsound.

In *Natural Resources Defense Council, Inc. v. County of Los Angeles* (2010) 2011U.S.App.LEXIS 4647, 41 Env.L.Rptr. 20109, the claimant alleged the co-permittees on an NPDES permit had discharged various pollutants in violation of the permit. (Exhibit "21" [NRDC Case].) The claimant argued initially that the "measured exceedances in the Watershed Rivers ipso facto establish Permit violations by Defendants." (NRDC, supra, at \*44.) However, the Ninth Circuit noted that because "the Clean Water Act does not prohibit 'undisputed' exceedances; it prohibits 'discharges' that are not in compliance with the Act (which means in compliance with the NPDES) ... responsibility for those exceedances requires proof that some entity discharged a pollutant." (Id, at \*44-45.)

Against this backdrop, the Ninth Circuit found that "the primary factual dispute between the parties is whether the evidence shows any addition of pollutants by Defendants" to the waterways. (NRDC, supra, at \*45.) The claimant asserted that because "the monitoring stations are downstream from hundreds of miles of storm drains which have generated the pollutants being detected" it was "irrelevant which of the thousands of storm drains were the source of polluted stormwater - as holders of the Permit, Defendants bear responsibility for the detected exceedances." (Id, at \*46.) The Ninth Circuit found this view unsatisfactorily simplistic as it "did not enlighten the district court with sufficient evidence for certain claims and assumed it was obvious to anyone how stormwater makes its way from a parking lot in Pasadena into the MS4, through a mass-emissions station, and then to a Watershed River." (Id, at \*47.)

Ultimately, the Ninth Circuit found adequate evidence of discharges for two of the rivers, where mass emissions stations detecting the exceedances were located in a portion of the MS4 "owned and operated" by the defendant in question. (NRDC, supra, at \*51-52.) In contrast with that conclusion, the Ninth Circuit found that "it is not possible to mete out responsibility for exceedances detected" in these waterways. (Id, at 52.) The Ninth Circuit was "unable to identify the relationship between the MS4 and these mass-emissions stations" and noted that "it appears that both monitoring stations are located within the rivers themselves." (Id.) The Ninth Circuit concluded that "[i]t is highly likely, but on this record nothing more than assumption, that polluted stormwater exits the MS4 controlled by the [defendants], and flows downstream in these rivers past the mass-emissions stations." (Id.) However, this assumption was inadequate because the claimant was "obligated to spell out this process for the district court's consideration and to spotlight how the flow of water from an ms4 'contributed' to a water-quality exceedance detected at the Monitoring Stations." (Id, at 52-53.)

Based on the foregoing, liability requires evidence the co-permittee "discharged" pollutants from an MS4 facility that the co-permittee owns or operates. Testing or monitoring taken from the affected waterway, rather than from the MS4 system, is not

adequate. This is so regardless of how "probable" or "likely" the assumption that the defendant may have discharged pollutants. In the present case, there is no evidence that SW4 or SW9 discharged any pollutants. Rather, the TCAO and DTR merely assume such discharges as "highly probable" based upon monitoring results from Chollas Creek. This is indistinguishable from the inadequate approach in National Resources Defense Council and cannot form the basis for liability arising out of the ownership or operation of an MS4 system.

ID 28

There is no Evidence that the Port's MS4 Facilities are Discharging Contaminants to the Shipyard Sediment Site

Even if there was adequate evidence that SW4 and SW9 are discharging pollutants, there are no monitoring or test results establishing that there have been discharges from the Port's MS4 facilities into the City MS4 facilities that lead to the outfalls at SW4 and SW9. National Resources Defense Council makes clear that there must be evidence that the specific Port MS4 facilities, not the MS4 system generally, are discharging pollutants. This is true regardless of how "probable" it is that such discharges might be taking place. Contrary to the correct legal standard, the DTR broadly and incorrectly identifies the offending Port MS4 facilities as SW4 and SW9. The DTR contains no factual analysis of any actual Port MS4 facilities, much less the content of the discharges from the Port MS4 facilities. In fact, the Port has only very limited MS4 facilities that lead to SW4 and no MS4 facilities leading to SW9.

Furthermore, the Port's status as co-permittee under the NPDES permit since 1990 does not make it liable for any and all discharges from SW4 and SW9, regardless of whether the Port's MS4 facilities discharged pollutants. Likewise, the Port is not broadly liable under the NPDES permit for its tenants' discharges into a portion of the MS4 system that the Port does not own or operate. There is no language in the NPDES permit that purports to impose such broad joint liability upon the Port. Such an interpretation of the NPDES permit would be contrary to the terms of the Clean Water Act, which is the basis for the NPDES permit. Under the Clean Water Act, a "co-permittee" is defined as "a permittee to an NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator." (40 Code of Federal Regulations § 122.26(b)(1).) This is further reflected in the analysis in National Resources Defense Council, in which the Ninth Circuit focused on and required evidence of discharges from specific MS4 facilities owned and operated by the defendants, not from the MS4 system generally.

In sum, the Port is responsible only for discharges from MS4 facilities that it owns or operates. The Port's status as co-permittee under the NPDES permit does not support the conclusion that the Port owns or operates the entire MS4 system. Likewise, the Port's status as trustee of tidelands property does not support the conclusion that the Port owns or operates all MS4 facilities located on that property. In the absence of evidence linking discharges of pollutants from a specific portion of the MS4 system that the Port owns or operates, the Port is not responsible under the NPDES permit for those discharges.

ID 286

Comment by the City of San Diego

There is sufficient evidence to conclude that the port has responsibility for discharges from its MS4 facilities.

In its comments submitted on May 26, 2011, the Port argues that because it does not own SW4 and SW9 of the MS4 permits, that its status as co-permittee under the NPDES permit for MS4 discharges does not make it liable for discharges into or from that part of the MS4 system{he San Diego Unified Port District's Submission of Comments, Evidence and Legal Argument, p. 13-16).

The MS4 permit requires all co-permittees to prohibit discharges into its MS4 system. The agreement between the co-permittees is that each co-permittee will implement programs to prevent discharges to the MS4 that runs through its jurisdiction. The Port District is a unique entity in that it is an overlay entity. The land within the Port District is also incorporated in the City of San Diego. However, the Port District has all rights of inspection and action on the land within its jurisdictional boundaries – namely, the tidelands. The City may have the easement that allows the storm drain to pass through the tidelands to drain the upland areas and tideland areas. But, the Port District is fully responsible, both under the MS4 permit and under its agreements with the co-permittees, to take all necessary actions to prevent discharges of pollutants into the MS4 system that runs through lands that are under the Port District's jurisdiction. Thus, to the extent there is any determination that discharges of the subject pollutants from the MS4 system have caused or contributed to a condition or nuisance or pollution at the Site, the Port should be liable as a Discharger.

ID 395

Comment by NASSCO

Port Comment No. 6: To the extent the CUT would designate the Port as a primary discharger because of perceived non-cooperation grounded in the Port's withdrawal from a voluntary mediation process that it suggested, such a position would be an inappropriate basis for Port primary liability as a matter of law. On the contrary, the Port's commitment to the above principles is reflected its long history of cooperating with the Regional Board in efforts to remediate sites at which the Port is a landlord . . . .

The DTR does not suggest that the Port was named as a primary discharger "because of perceived non-cooperation grounded in the Port's withdrawal from a voluntary mediation . . .", however, the Port provides no legal authority why a failure to cooperate would not be a relevant factor in naming the Port to the TCAO. DTR at 11-1 – 11-5.

ID 396

Comment by NASSCO

Port Comment No. 7: The DTR acknowledges that "[i]n the event the Port District's tenants, past and present, have sufficient financial resources to clean up the Shipyard Sediment Site and comply with the Order, then the San Diego Water Board may modify

its status to secondarily responsible party in the future.” (DTR §11.2, at pp. 11-4 to 11-5.) This anticipated modification is appropriate and should be implemented because there is substantial evidence of the Port District’s tenants’ abilities to fund the Order. . . . the CUT bears an initial burden of establishing through evidence the facts necessary to conclude that the Port’s tenants do not have adequate assets to fund the cleanup efforts. Yet, no such evidence has ever been presented.

It is premature for the Regional Board to determine whether the Port’s tenants, past and present, have sufficient financial resources to cleanup the Site, since those costs have not yet been determined with specificity and work has not yet begun. Until work progresses on the cleanup, it is reasonable for the Regional Board not to distinguish between primarily and secondarily liable parties. See *In re Wenwest, Inc., State Water Resources Control Board Order No. WQ 92-13*, at 3 n.2.

ID 397

Comment by NASSCO

Port Comment No. 8: In fact, the evidence establishes beyond question that the Port’s tenants have adequate assets to fund the cleanup efforts. . . . Additionally, the Port’s tenants have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability. (See, e.g., SAR 159273, 159289 at ¶21 [NASSCO Lease]; . . . .)

Whether a landlord’s lease includes an indemnity clause is not determinative as to whether the landlord should be named primarily or secondarily liable. See *In re Wenwest, Inc., State Water Resources Control Board Order No. WQ 92-13*, at 7-9 (whether lease includes indemnity clause not included as a factor in determining landlord liability).

Accordingly, it is irrelevant to the Regional Board’s decision to name the Port as primarily liable at this time whether the lease agreement includes indemnity language. Finally, it bears mention that the Port only cites to NASSCO’s lease for the period from January 1, 1995 to December 31, 2040, and not to any prior leases with NASSCO, which contain materially different language with respect to NASSCO’s and the Port’s obligations to one another.

ID 398

Comment by NASSCO

Port Comment No. 9: Additionally, based on its review of relevant documents, the Port believes that NASSCO has hundreds of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit “12” [Summary of NASSCO Historic Liability Insurance].)

The information in Port Comments, Exhibit 12 (Summary of NASSCO Historic Liability Insurance) was submitted by the Port in breach of a Protective Order entered in Case No. 09 CV 2275-AJB (BGS) in the United States District Court, Southern District of California, regarding the allocation of costs for the cleanup of the Shipyard Sediment

Site. The Protective Order prohibited the Port from publicly disclosing any information, including insurance policies, that was designated as “protected” information by NASSCO, or from using “protected” information for any purpose other than prosecuting or defending the federal court lawsuit. NASSCO is presently contesting the Port’s publication of NASSCO’s insurance information in a motion pending before Mr. Timothy Gallagher, the Discovery Referee. For these reasons, NASSCO believes that the insurance information in Port Comments, Exhibit 12 is not properly before the Regional Board, and NASSCO may seek the withdrawal or removal of Exhibit 12 from the administrative record following Mr. Gallagher’s ruling on NASSCO’s motion.

ID 399

Comment by NASSCO

Port Comment No. 10: The Port’s tenants are currently cooperating with the Regional Board. Although the tenants have been proposing a remedial approach that differs in some respects from the remedial approach proposed by the CUT, the process is “proceeding cooperatively.” (Exhibit “5” [Barker Deposition], Vol. III, 489:20-490:14.)

It is premature for the Regional Board to determine whether the Port’s tenants, past and present, are cooperating with the Regional Board as work has not yet begun. Until work progresses on the cleanup, it is reasonable for the Regional Board not to distinguish between primarily and secondarily liable parties. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 3 n.2.

Furthermore, as presented in NASSCO’s Initial Comments, NASSCO maintains that monitored natural attenuation is the proper remedy for the Site. This position differs materially from the TCAO and DTR under consideration by the Regional Board.

ID 400

Comment by NASSCO

Port Comment No. 11: There is no evidence of Port non-cooperation.

See NASSCO’s Comment No. 369 (See Appendix B, Comment ID 395), Replying to Port Comment No. 6.

ID 401

Comment by NASSCO

Port Comment No. 12: The Port does not own or operate SW4 or SW9 outfall or the MS4 facilities leading to these outfalls. . . . Rather, the contention is that the Port is “responsible for controlling pollutants into and from its own MS4 system” and that “the Port District cannot passively allow pollutants to be discharged through its MS4 and into another Copermittees’ MS4s, like the City of San Diego.” (Exhibit “17” [CUT Discovery Response Excerpts], Responses to Special Interrogatories Nos. 28, 30. [emphasis in the original].) Yet, neither the DTR nor the administrative discovery responses identify what part of the MS4 owned or operated by the Port would ultimately lead to SW4 or SW9, much less how such MS4 facilities have discharged pollutants to SW4 or SW9.

The Port's comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the Port presents no affirmative evidence to show that they do not. Instead, like the City, the Port attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

In fact, the Port's own most recent Jurisdictional Urban Runoff Management Program ("JURMP") document admits that the Port MS4 facilities have the potential to generate pollutants, including bacteria, gross pollutants, metals, nutrients, oil and grease, organics, pesticides, sediment, and trash. Attachment D, San Diego Unified Port District, Jurisdictional Urban Runoff Management Program (May 2008) ("2008 Port JURMP") Table 6-2 at 6-4. The JURMP goes on to state that the "MS4 receives pollutants generated by motor vehicles, namely, heavy metals, oil and grease, and other toxic pollutants from engine exhaust, brake linings, and leaking fluids. Waste liquids, such as oil and paint, can also be illegally dumped into conveyance system structures. Illegal connections can be made to the MS4 and potentially introduce a wide variety of pollutants to the system. Street curbs and gutters, stormwater inlets, culverts and channels typically collect litter discarded in urban areas. As such, all of these pollutants can reach the MS4 with each rainfall event, and in turn, be carried to receiving water bodies." *Id.* at 6-7. It also admits that "[u]rban runoff also appears to be a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay," including "the mouth of Chollas Creek . . ." *Id.* at 1-6 – 1-7. This evidence substantiates the Regional Board's conclusion that the Port is a discharger based on its historical storm water discharges to the Site.

Furthermore, the Port's JURMP indicates that the Port has a sophisticated GIS map of its storm drains, which is not publicly available but could easily have been used by the Port to generate the necessary information to demonstrate whether the Port's MS4s connect to SW4 and/or SW9. See Attachment D, 2008 Port JURMP Table 6-2 at 6-4; Attachment E, Karen Richardson, GIS Gives Port a Common Operating Picture, *ArcUser* (Winter 2010) at 33 ("PortGIS Utilities is the central clearinghouse for the port's utilities data, including . . . storm drain . . . lines"). Accordingly, it is unfair for the Port to assert that the DTR and TCAO are insufficient because they do not specify what part of the Port's MS4 system connects to SW4 and/or SW9 when that information is uniquely in the possession of the Port itself.

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Comment by NASSCO

Port Comment No. 13: The DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination.

See NASSCO's Comment No. 375, 377 (See Appendix B, Comment IDs 401, 405),  
Replying to Port Comment No. 12 and 14.

ID 403

Comment by NASSCO

Port Comment No. 14: The TCAO and DTR fail to provide evidentiary support for the conclusion that SW4 and SW9 have discharged contaminants to San Diego Bay and the Shipyard Sediment Site. In fact, the DTR acknowledges that “no monitoring data is available” for either SW4 or SW9. (DTR §§11.6.4, at p. 11-13 [SW4]; 11.6.5, at p. 11-15 [SW9].)

The Port contends that there is “no [e]vidence” that storm water outfalls SW4 and SW9 are discharging contaminants to the Site. The Port bases this claim on the fact that there is no monitoring data available from either SW4 and SW9 to indicate specific quantities of COCs in the runoff.

The Port’s claim that there is “no [e]vidence” goes too far because, as noted in the DTR, urban runoff itself is classified as a “waste” under the California Water Code § 13050(d). DTR at 11-8; see also Cal. Water Code §§ 13392 (State and Regional Boards to coordinate with Departments of Public Health and Fish & Game to develop “new programs to reduce urban and agricultural runoff”); 13396.7(a) (commissioning a study to determine adverse health effects of urban runoff on swimmers at urban beaches). In fact, the DTR includes substantial evidence that urban runoff in San Diego contains COCs at the Site, including “total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.” DTR at 11-8; see also 4-10 (San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring Final Report submitted by the City indicating that “elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay”).

Furthermore, the DTR demonstrates that samples taken in the SW4 catch basin, and laterals entering the catch basin, “indicate the presence of both PCBs and PAHs entering and exiting the municipal storm drain system catch basin . . . .” DTR at 4-16. Far from suffering from a lack of evidence, the DTR has presented substantial evidence that San Diego urban runoff contains relevant COCs, but simply did not take the extra step to quantify the amount of COCs that actually are present in storm water flows as they exit the SW4 and SW9 outfalls.

Notably, the Port’s comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the Port presents no affirmative evidence to show that they do not. Instead, like the City, the Port attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

Furthermore, the Port’s citation to *Natural Resources Defense Council v. County of Los Angeles*, 636 F.3d 1235 (9th Cir. 2011) (“NRDC”), is unavailing with respect to allocating responsibility for storm water contamination to sediment to the Port. This is so because NRDC is a case under the Clean Water Act concerning whether a NPDES permittee was guilty of violating NPDES permit limits. Here, the issue is not whether the



Port violated NPDES permit limits, but rather, whether the Port discharged COCs to the Site that have contaminated sediment. In fact, the DTR does not allege that the Port has violated its NPDES permit, but rather, that the Port has discharged storm water containing contaminants to San Diego Bay, and that the “urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay.” DTR at 11-1 – 11-2. As noted above, the Port fails to allege that storm water discharges from SW4 and SW9 do not contain relevant COCs.

Finally, as also noted in the DTR, “[i]n the absence of such direct evidence, the San Diego Water Board may consider relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304.” DTR at 10-13, citing State Water Resources Control Board Resolution 92-49, Policies and Procedures for the Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304, § I.A (directing the Regional Boards to use “any relevant evidence, whether direct or circumstantial”, when determining whether a party should be required to investigate or cleanup a discharge of waste). Accordingly, even if storm water sampling data from SW4 and SW9 is unavailable, it is proper for the Regional Board to consider and rely on other direct and circumstantial evidence that leads to the conclusion that the Port’s storm water discharges have contaminated the NASSCO shipyard.

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Comment by NASSCO

Port Comment No. 15: Even if there was adequate evidence that SW4 and SW9 are discharging pollutants, there are no monitoring or test results establishing that there have been discharges from the Port’s MS4 facilities into the City MS4 facilities that lead to the outfalls at SW4 and SW9. . . . In fact, the Port has only very limited MS4 facilities that lead to SW4 and no MS4 facilities leading to SW9.

See NASSCO’s Comment No. 377 (See Appendix B, Comment ID 403), Replying to Port Comment No. 14.

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Comment by BAE Systems

BAE Systems San Diego Ship Repair, Inc.’s reply to the San Diego Unified Port District’s comments.

## I. INTRODUCTION AND FACTUAL BACKGROUND

### A. Port District as Lessor

From the early 1900s until 1962, the City owned and leased what is now the BAE Systems Leasehold to a host of industrial tenants. The Port District, which was created by statute in 1962, now holds and manages the BAE Systems Leasehold as trust property

on behalf of the People of the State of California. The Port District likewise leased the BAE Systems Leasehold to industrial tenants unrelated to BAE Systems from 1962 to 1979 (1985 for the South end of the yard).

The lease agreement between BAE Systems and the Port District requires that BAE Systems use the leasehold exclusively for shipbuilding and repair and related marine activities, authorizes the Port District to suspend operations under certain circumstances, prohibits BAE Systems from assigning or subleasing the site without the Port District's permission, permits the Port District to inspect the leasehold, permits the Port District to approve or deny termination of the lease by BAE Systems, and permits the Port District to terminate the lease for violations of the lease's terms and conditions. (See SAR 057580-057608 [1979 Southwest Marine Lease]; SAR 057609-057640 [Southwest Marine Agreement for Amendment of Lease No. 1].) The lease further acknowledges that BAE Systems' tenancy provides to the community water front employment, tax revenue, as well as lease income. (Id.) A number of industrial tenants unrelated to BAE Systems previously leased the premises under lease terms similar to the Port District's lease with BAE Systems. Certain of those entities are defunct, recalcitrant and/or not participating in these proceedings.

In addition to its management of the land currently identified as the BAE Systems Leasehold, the Port District also manages land currently occupied by NASSCO, as well as the cooling water tunnels for SDG&E's former Silver Gate Power Plant. (TCAO Finding 11; DTR § 11.1.)

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

## INTRODUCTION AND FACTUAL BACKGROUND

### Port District's Primary Liability as Owner and Operator

Because the Port District (1) was responsible for the use and maintenance of the land currently leased by NASSCO, BAE Systems, and SDG&E and the land formerly leased by San Diego Marine Construction Co., Star & Crescent and Campbell; (2) had knowledge of the potential for discharges from the leased properties to materially contribute to accumulations of pollutants in the San Diego Bay; and (3) had the requisite degree of control over its tenants' activities, the DTR correctly concludes that the "the Port District caused or permitted waste to be discharged into San Diego Bay, creating a condition of pollution and/or nuisance in the Bay at the Shipyard Sediment Site . . . ." (TCAO Finding 11; DTR § 11.1.) As such, the DTR names the Port District as a "discharger, . . . consistent with its responsibility for the actions, omissions and operations of its tenants." (Id.)

As a separate and independent basis for primary liability, the Port District also owns and operates a municipal storm sewer system (MS4). (TCAO Finding 11; DTR § 11.3.) The Port District is a co-permittee of current and prior NPDES Storm Water Permits that

regulate the MS4 drains which outfall on the BAE Systems Leasehold (SW4) and the NASSCO Leasehold (SW9). (Id.) The DTR concludes that the Port District, through its MS4 conveyances, has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. (TCAO Finding 11; DTR § 11.4.) The Port District admits the same. (Port District comments, at 17.)

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

## II. LEGAL STANDARD FOR NAMING DISCHARGERS

In 1969, the California legislature enacted the Porter-Cologne Water Quality Control Act, Cal. Water Code §§ 13000-14958 (hereinafter, the "Act"), with the declared objective of ensuring "that the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state." Cal. Water Code § 13000. With this objective in mind, the Act grants the Regional Board broad latitude to issue Cleanup and Abatement Orders ("CAOs") when necessary to protect California's valuable and limited water resources from contamination. Cal. Water Code § 13304(a). Specifically, the Act provides that the Regional Board may order cleanup and abatement by the following: (1) "any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board;" or (2) any person "who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance." Id.

The regulations governing the investigation and issuance of CAOs further require that the Regional Board name other dischargers to the maximum extent permitted by law. See 23 Cal. Code Regs. § 2907; See also State Water Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304," at § II(A)(4).

The Regional Board is granted this broad authority precisely because of situations, such as the one here, where contamination is discovered many years after the events causing the contamination. As stated by a leading treatise on California environmental law: "Due to the passage of time and the difficulty of interpreting hydrogeologic evidence, it often is impossible to establish who is responsible for the contamination with a great degree of certainty." Kenneth A. Manaster and Daniel P. Selmi, California Environmental Law and Land Use Practice, § 32.32(1)(a), at p. 32-42.

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

## III. THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR PRIMARY RESPONSIBILITY

The DTR properly concludes that the Port District “should not bear merely secondary responsible at this time.” The DTR finds that the Port District should be held responsible “to the extent the Port’s tenants, past and present, have insufficient financial resources to cleanup the Shipyard Sediment Site and/or fail to comply with the order.” (TCAO Finding 11; DTR § 11.2.)

The Port District does not appear to dispute that it should be named as a discharger due to its capacity as a landlord of tenants identified in the TCAO as dischargers. (Port District Comments at 7.) Nevertheless, the Port District contends that it is entitled to status as a secondarily responsible party because “[t]he Port’s tenants have more than sufficient assets to conduct the cleanup.” (Id. at 8.) There are a number of issues with the Port District’s position that render it incorrect.

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BAE Systems San Diego Ship Repair, Inc.’s reply to the San Diego Unified Port District’s comments

**THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR PRIMARY RESPONSIBILITY**

**A. The Port District Bears the Burden of Demonstrating That its Current and Former Tenants Have Sufficient Assets to Conduct the Cleanup**

As an initial matter, the Port District’s comments reflect a fundamental misunderstanding of the allocation of burdens in a secondary liability inquiry. The Port District asserts that the prior iterations of the TCAO did not name the Port District as a primary discharger “because of its determination that the Port’s tenants had adequate assets to conduct the cleanup and were cooperating.” (Port District Comments at 8.) To the contrary, the prior iterations of the TCAO noted only that there was “no evidence at this time indicating that [the Port’s tenants] have insufficient financial resources to cleanup the Shipyard Sediment Site.” (SAR 375780, at 372818-375819.) These prior iterations improperly placed the burden of demonstrating the Port District’s entitlement to secondary liability status on the Port District’s tenants. The Presiding Officer, however, has correctly ruled that as the party seeking status as a secondarily responsible party, it is the Port District’s burden to demonstrate that its current and former tenants have sufficient assets to cover the cleanup. (October 27, 2010 Order Reopening Disc. Period, at § III.)

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BAE Systems San Diego Ship Repair, Inc.’s reply to the San Diego Unified Port District’s comments

**THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR PRIMARY RESPONSIBILITY**

**B. The Port District has Failed to Meet its Burden**

The DTR's conclusion that the Port District should be named primarily responsible is correct because the Port District has failed to meet its burden of establishing that equitable reasons justify imposing secondary liability. Secondary liability is appropriate, if at all, in cases where there are equitable reasons that justify imposing different liability on the relevant parties. See, e.g., *In the Matter of the Petitions of Arthur Spitzer et al.*, Order No. 89-8, at p. 25 (holding that it would be inappropriate to name a successor entity as "secondarily" liable when its predecessor entity released contaminants which polluted the waters of the State).

#### 1. BAE Systems has No Liability for Any Pre-1979 Discharges Including "Orphan Shares"

BAE Systems does not dispute, and in fact has stipulated, that it has the financial assets to cover amounts of the cleanup and remedial monitoring under the TCAO which are based on BAE Systems' post 1979 tenancy at the Leasehold and which are ultimately allocated to BAE Systems. The Port District erroneously asserts that it believes BAE Systems should also have to fund cleanup and remedial monitoring costs that are attributable to former tenants of the BAE Systems Leasehold who are unable or unwilling to pay for their own share of the cleanup effort. That position is factually and legally incorrect.

Here, BAE Systems is not the successor entity to any of the entities that operated on the BAE Systems Leasehold prior to 1979. BAE Systems had no connection to the BAE Systems Leasehold prior to 1979 when it entered into its lease with the Port District. Accordingly, BAE Systems is not a "discharger" under section 13304 of the Act for any pre-1979 discharges. The Port District, on the other hand, remains primarily liable for any pre-1979 discharges to the extent its tenants for any applicable time period are unable or unwilling to fund the cleanup of discharges attributable to such time period.

Where the operator responsible for the discharge is no longer in existence or not cleaning up the site, thus creating a so called "orphan share," the landowner is considered the "discharger" and is primarily liable for remediating the site. In *In the Matter of the Petitions of Aluminum Company of America et al.*, Order No. 93-9, at pp. 16-18. "The Board has cited several factors which are appropriate for the Regional Water Boards to consider in determining whether a party should be held secondarily liable. These include: (1) whether or not the party initiated or contributed to the discharge; and (2) whether those parties who created or contributed to the discharge are proceeding with cleanup." *Id.* at p. 16 (citations omitted). As the DTR properly concludes, both factors cut against finding the Port District merely secondarily liable. As discussed above, the lease provisions gave the Port District significant control over the activities of the former tenants of the BAE Systems Leasehold. By permitting these entities to discharge, unabated, for a number of years, the Port District contributed to the discharge. As to the second factor, the ability of all of the parties to pay for their respective shares of the cleanup is far from clear at this time. Even the Port District concedes as much, noting that "the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site." (Port District's comments at 11.) Indeed, the successor liability analysis

utilized in the DTR to find Star & Crescent to be the successor to San Diego Marine Construction Company's liability is debatable, and is the subject of a pending motion for summary judgment by Star & Crescent in the federal action. Thus, to the extent these entities are not and cannot comply with the CAO, which certainly appears likely at least with respect to San Diego Marine Construction Company (1962-1972), and potentially Campbell (1972-1979), the Port District is responsible. Accordingly, it is appropriate for the Port District to be considered primarily liable for compliance with the TCAO unless and until those parties fully comply with the final order.

Although it appears to concede liability for any “orphan shares,” the Port District attempts to escape liability by claiming that its tenants, including BAE Systems, “have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability.” (Port District’s comments at 9.) With respect to BAE Systems, this is patently false. The Hold Harmless provision in the Southwest Marine lease upon which the Port District relies, was superseded and replaced entirely with a different Hold Harmless provision that precludes the Port District’s argument. The Second Amendment to the lease expressly amends the First Amendment by “deleting therefrom Paragraphs...21...in [its] entirety and substituting in lieu thereof Paragraphs...21...as follows.” (See Second Amendment to Southwest Marine Lease, at ¶ 21.) It then states:

21. **HOLD HARMLESS:** Lessor, and its agent, officers, and employees shall, to the full extent allowed by law, be held by Lessee free and harmless from and indemnified against any liability pertaining to or arising out of the use and operation of the premises by Lessee and any costs of expenses incurred on account of any claim or claims therefore, including reasonable attorney’s fees. Nothing herein is intended to exculpate Lessor from its sole active negligence or willful misconduct.

(Id. (emphasis added).) This Hold Harmless provision requires only that BAE Systems indemnify and hold harmless the Port District for liability arising out of BAE Systems’ use and operation of the premises, not prior lessees’ use and operation of premises. A written modification of the terms of a contract “supersedes those terms to which it relates.” *Thiele v. Merrill Lynch, Pierce, Fenner & Smith*, 59 F. Supp. 2d 1060, 1064 (S.D. Cal. 1999). Because the Hold Harmless Provision in the Second Amendment completely superseded all prior Hold Harmless Provisions, BAE Systems has no obligation to defend and indemnify the Port District for any liability arising out of any “orphan shares.”

## 2. Mere Reference to Historical Insurance Policy Limits Fails to Demonstrate Applicability or Availability of Any Assets

The Port District asserts, without support, that it “believes BAE has tens of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts.” (Port District’s comments at 9 (emphasis added).) As support for its “belief,” the Port District relies exclusively on a summary of “BAE Historic Liability Insurance” that it includes in its comments to the Regional Board. The

same reliance is made with respect to historical insurance summaries for other parties, also prepared by the Port District.

However, the Port District merely cites to what it says are policy limits for historical policies. The Port District makes no showing whatsoever (1) whether the policy provides actual coverage for the claims and anticipated obligations at issue here, (2) whether the insurer is defunct or insolvent, (3) whether any policy amounts have been sold back or are otherwise unavailable, and (4) most importantly, whether any insurer for any party has actually accepted coverage for indemnity obligations. This lack of evidence is unsurprising, as courts have consistently held that the obligation to indemnify does not arise until the insured's underlying liability is established. See, e.g., *Montrose Chemical Corp. v. Admiral Ins. Co.*, 10 Cal. 4th 645, 659 n.9 (1995). Without any such evidence or showing, the Port District's "belief" as to BAE Systems' and other dischargers' "potential" insurance assets is unsupported, insufficient, and certainly is not evidence upon which the Regional Board can or should change the Port District's status to that of a secondarily responsible party.

The Regional Board has a broad duty to name all dischargers in CAOs to the maximum extent permitted by the Water Code. Because the Port District has failed to demonstrate that its tenants, including BAE Systems, are obligated to conduct the cleanup attributable to any orphan shares or have sufficient assets to do so, the DTR's conclusion that the Port be named a primarily responsible party is correct.

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

#### THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR PRIMARY RESPONSIBILITY

##### C. Any Change in the Port District's Liability Status Would be Premature

It is premature for the Regional Board to determine whether the Port District's current and historical tenants have sufficient financial resources to remediate the Site because the remediation costs have not yet been finally or specifically determined. Until the remediation is underway, it is inappropriate for the Regional Board to alter the primarily versus secondarily liability of designated parties. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 3 n.2. Moreover, it cannot be determined whether any designated party "fails to comply with the order" unless and until the final CAO has been issued and a party fails to comply with those directives. (DTR § 11.2.) It is the Port District's burden to establish it is not primarily liable. See § III-A, *infra*. The Port District has failed to meet its burden.

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

**IV. THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS**

The Port District contends that it cannot be named as a discharger as a result of its ownership of its MS4 facilities because “[t]he DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination.” (Port District’s comments at 15.) “There is no evidence that SW4 or SW9 discharged any pollutants,” the Port District claims. (Id. at 17.) The Port District’s positions, however, are incorrect. There is substantial and reasonable evidence to support the DTR’s assertion that the Port District’s discharges into and through the SW4 storm drain outfall have contributed to elevated levels of pollution at the BAE Systems Leasehold.

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BAE Systems San Diego Ship Repair, Inc.’s reply to the San Diego Unified Port District’s comments

**THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS**

**A. Regional Boards Should Review Evidence with a View Towards Liability**

To be named as a discharger, all that is required is “sufficient evidence” of responsibility. See The State Board Water Quality Enforcement Policy, No. 2002-0040, (Feb. 19, 2002). To this end, “a regional water board shall “[u]se any relevant evidence, whether direct or circumstantial” in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added). The resolution provides a number of potential sources of evidence, including site characteristics and location in relation to other potential sources of a discharge; hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality; industry-wide operational practices that have led to discharges, such as conveyance systems; and physical evidence, such as analytical data. (Id.)

In light of the Act’s declared objective and the broad discretion granted to regional water boards by the Act and its implementing regulations, State Water Board decisions suggest that a regional water board should look at evidence with a view toward finding liability. According to the State Water Board, “[g]enerally speaking it is appropriate and responsible for a Regional Board to name all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility.” See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 11 (SWRCB 1985) (noting further that “substantial evidence” means “credible and reasonable evidence which indicates the named party has responsibility”); Stinnes-Western Chemical Corp., Order No. 86-16, at 12 (SWRCB 1986) (same).

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BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

**THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS**

**B. NRDC is Inapposite and Does Not Apply the Evidentiary Standard Applicable in Administrative CAO Proceedings**

The Port District heavily relies on *Natural Res. Def. Council, Inc. v. County of Los Angeles*, 636 F.3d 1235 (9th Cir. 2011) (hereafter "NRDC") to argue that the evidence upon which the DTR relies is inadequate. This case is of no relevance here. In NRDC, the plaintiffs sought to impose liability on municipal defendants for violations of the Federal Clean Water Act for what the plaintiffs contended were exceedances of the water-quality standards contained in the defendants' respective NPDES permits. (Id.) The evidence required to demonstrate an unlawful exceedance is different from the evidence required to be named as a discharger in a cleanup and abatement order. As noted, the Regional Board has broad discretion to name dischargers in a cleanup and abatement order, and all that is required to exercise that discretion is "credible and reasonable evidence which indicates the named party has responsibility." See, e.g., *Exxon Company U.S.A. et al.*, Order No. 85-7, at 12 (SWRCB 1985). It is for this reason that courts review agency decisions under an abuse of discretion standard. See *Topanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal. 3d 506, 515 (1974) (noting that the agency which renders the challenged decision is only required to "set forth findings to bridge the analytic gap between the raw evidence and ultimate decision or order"). Thus, the Ninth Circuit's assessment of the degree of proof necessary to hold an entity liable for a NPDES Permit exceedance has no bearing on the evidence required to name the Port District as a discharger in the TCAO, and consequently *Natural Res. Def. Council* is fundamentally distinguishable and should be disregarded.

Moreover, *Natural Res. Def. Council* is inapposite because it is an action brought under the Clean Water Act centered on whether a NPDES permittee had violated the NPDES permit limits. Conversely, in the instant action, the issue is whether the Port District discharged contaminants to the Site that have contributed to the contamination. The DTR makes clear that urban runoff from the Port's MS4 facilities has been discharged to the Site, contributing to the contamination by exceeding applicable water quality objectives for the Bay. (DTR, Finding 11.) The DTR does not allege the Port District violated its NPDES permit.

Even if the *Natural Res. Def. Council* case has any applicability to these proceedings, the Ninth Circuit's ruling does not relieve the Port District of liability for contaminants it conveyed to the San Diego Bay. The Ninth Circuit made clear that the Clean Water Act "does not distinguish between those who add and those who convey what is added by others—the Act is indifferent to the originator of water pollution." NRDC, 636 F.3d

1235, 1252-53. In fact, according to the Ninth Circuit, the Clean Water Act bans “the discharge of any pollutant by any person” regardless of whether that “person” was the root cause or merely the current superintendent of the discharge.” *Id.* at 1253 (internal quotations and citation omitted). Thus, as the Fifth Circuit has held, so long as the MS4 is “the means by which the pollutants are ultimately deposited into a navigable body of water,” the party can be held liable for those discharges, regardless of any permit. *Sierra Club v. Abston Constr. Co.*, 620 F.2d 41, 45-46 (5th Cir. 1980).

Accordingly, so long as there is sufficient evidence, either direct or circumstantial, to find that the Port District’s SW4 outfall has contributed to elevated levels of pollution at the Site, the DTR’s conclusion is correct.

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BAE Systems San Diego Ship Repair, Inc.’s reply to the San Diego Unified Port District’s comments

**THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT’S MS4 FACILITIES HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS**

**C. Substantial and Reasonable Evidence Supports the DTR’s Assertion That the Port District’s SW4 Outfall has Contributed to Elevated Levels of Pollution at the Site**

The DTR properly concludes that the Port District’s SW4 outfall has contributed to elevated levels of pollution at the BAE Systems Leasehold. The Port District does not dispute that it has MS4 facilities that lead to SW4. (Port District’s comments at 17.) In fact, the Port District’s (untimely) proffered expert opinion of Mr. Collacott admits that the “portion of the Port District that is not leased to tenants and is tributary to outfall SW4 is limited to portions of Belt Street (approx. 1 acre) consisting of an estimated one-half mile (1/2 mile street) of curb and gutter, four storm drain inlets, and an estimated 770 feet of underground storm drains 24-inches in diameter and smaller.” (Declaration of Robert Collacott In Support of the San Diego Unified Port District’s Submission of Comments, Evidence and Legal Argument, at 4:9-14.) Presumably the Port District has owned and operated this tributary system to outfall SW4 since 1962.

SW4 has historically received runoff from Belt Street (among other areas). (DTR, p. 11-6.) That fact, coupled with the Port District’s own statements regarding the scope of portions of its MS4 facilities, reflects an admission by the Port District that municipal wastewater from its own MS4 facilities is discharged into SW4 where it is discharged to the Site at the BAE Leasehold. As reflected below, substantial and reasonable evidence exists that supports the DTR’s MS4 allegations and findings against the Port District. Importantly, “a regional water board shall “[u]se any relevant evidence, whether direct or circumstantial” in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added).

1. 2009 SW4 Sampling Data Detects PCBs, Copper, TBT and Mercury

On December 7, 2009, water quality data from SW4 were collected from a manhole on the BAE leasehold. (Calscience Environmental Laboratories, 2009). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. Laboratory analyses included a congener-level analysis of PCBs. Multiple congeners were detected, and the highest concentrations were of penta- and hexa-chlorinated biphenyls, similar to the profile of Aroclor 1254. (Id.) Copper, mercury, and TBT were also measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of 2009 there was an ongoing source of PCBs, copper, mercury and TBT from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2009 have dissipated, nor have upland source control measures been established, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain an ongoing source of these COCs to the Site.

## 2. 2005 SW4 Sampling Data from City Investigation Detects PCBs and PAHs

Further evidence of discharges from storm drain SW4 into the Shipyard sediment site is provided by the results of a sampling investigation conducted by the City of San Diego. As described in the DTR (section 4.7.2), on October 3, 2005, the City conducted an investigation and observed evidence of an illegal discharge into the SW4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems' parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. As noted above, the Port District admits that its own MS4 facilities drain the Belt Street area and discharge to the Bay via SW4.

During the City's investigation, three sediment samples were collected and analyzed for PCBs and polycyclic aromatic hydrocarbons (PAHs). The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the east. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from the north. The third sample was collected from the 18-inch pipe exiting the catch basin. The results of these three samples, presented in DTR Table 4-4, indicate the presence of PCBs and PAHs entering and exiting the municipal storm drain system catch basin. The results of this sampling show significant concentrations of Aroclor 1254 and 1260. (DTR Table 4-4.) The Port District has cited no evidence or even argument to the contrary. Thus this data is further evidence of the Port District's illicit discharges of contaminants through its MS4 facilities that discharged directly to the Site.

## 3. 2001 SW4 Sampling Data Detects TBT, Copper and Mercury

On November 29, 2001, water quality data from SW4 were collected from a manhole on the BAE leasehold. (AMEC, 2001). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. TBT, copper, and mercury were all measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of late 2001 there was an ongoing source of TBT, copper, and mercury from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2001 have dissipated, nor have upland source

control measures been established, and moreover the 2009 SW4 data again detects these same COCs in addition to PCBs, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

#### 4. Historical Discharges by the Port District into SW4 have Significantly Contributed to Contamination at the Site

In 1974 the Southern California Coastal Water Research Project ("SCCWRP") published the results of an EPA-funded study entitled "Marine Inputs from Polychlorinated Biphenyls and Copper from Vessel Antifouling Paints." (Young et al., 1974.) The project surveyed the usage of PCB-containing hull paint on recreational, commercial, and Navy vessels in San Diego Bay and other southern California bays, and also collected data on PCB releases in municipal wastewater and storm runoff. (Id.)

Contrasting the PCB mass release rates for different sources (Table 12 in Young et al. 1974) shows that municipal wastewater was a major source of Aroclor 1254 to San Diego Bay, contributing more than 99.9 percent of total PCBs. Thus, as of 1974, municipal wastewater carried by the Port District's MS4 system and discharged via SW4 was a significant source of PCB contamination at the BAE Leasehold. (Id.) The Port District identifies no study or data indicating that the sources of PCBs to the San Diego Bay was by any means other than those identified by Young, et al. Absent findings to the contrary, it is reasonable to conclude that the Port District was a significant contributor of PCBs to the San Diego Bay at least from its creation in 1962 through the 1974 date of the SCCWRP study, and likely longer.

#### 5. EPA Guidance Confirms that Waste Water Discharged by the Port District into SW4 has Significantly Contributed to Contamination at the Site

Relevant EPA guidance supports the DTR's findings with respect to waste in urban storm water discharged by the Port District into the SW4 outfall at the BAE Leasehold. In 1983 the EPA published "Results of the Nationwide Urban Runoff Program." The Executive Summary states that among the many objectives of the National Urban Runoff Program ("NURP") was to develop analytical methodologies to examine "the quality characteristics of urban runoff, and similarities or differences at different urban locations" and "the extent to which urban runoff is a significant contributor to water quality problems across the nation." (EPA, Results of the Nationwide Urban Runoff Program, Executive Summary at p. 1.) "The NURP studies have greatly increased our knowledge of the characteristics of urban runoff, its effects upon designated uses, and of the performance efficiencies of selected control measures." (Id. at p. 2.) The NURP Final Report reached several relevant conclusions, including:

- "Heavy metals (especially copper, lead and zinc) are by far the most prevalent priority pollutant constituents found in urban runoff. End-of-pipe concentrations exceed EPA ambient water quality criteria and drinking water standards in many instances. Some of the metals are present often enough and in high enough concentrations to be potential threats to beneficial uses." (Id. at p. 5.)

- "Total suspended solids concentrations in urban runoff are fairly high in comparison with treatment plant discharges. Urban runoff control is strongly indicated where water quality problems associated with TSS, including build-up of contaminated sediments, exist." "[T]he problem of contaminated sediment build-up due to urban runoff...undeniable exists." (Id. at p. 6.)
- "A summary characterization of urban runoff has been developed and is believed to be appropriate for use in estimating urban runoff pollutant discharges from sites where monitoring data are scant or lacking, at least for planning level purposes." (Id. at p. 7.)

With respect to this last conclusion regarding the development of a summary characterization, the NURP Report states that "[a]lthough there tend to be exceptions to any generalization, the suggested summary urban runoff characteristics given in Table 6-17 of the report are recommended for planning level purposes as the best estimates, lacking local information to the contrary." (Id. at p. 7.) "[I]n the absence of better information the data given in Table 6-17 are recommended for planning level purposes as the best description of the characteristics of urban runoff." (EPA, Results of the Nationwide Urban Runoff Program, Volume I – Final Report, at p. 6-43.) Those characteristics of urban runoff include the presence of significant levels of pollutants including total suspended solids, heavy metals, inorganics, and pesticides. (Id., at Tables 6-17 through 6-21.) The NURP data supports and confirms the DTR's assertion that:

"The Port District has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR, § 11.4.)

The NURP data also supports and confirms the DTR's assertion that "it is highly probable that historical and current discharges from [SW4] outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site." (DTR § 11.6.4.)

## **Response 11.1**

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### **Summary Of Arguments And Recommendations.**

The Port District argues that it should be named secondarily liable as a public-agency landowner because its current and former tenants have sufficient financial resources to undertake the cleanup the TCAO requires, and because those tenants are cooperating with the TCAO. The Port District further contends that it should not be named as a discharger because there is no substantial evidence to support the finding it caused or contributed to the condition of pollution or nuisance that exists at the Shipyard Sediment Site because of its responsibilities for discharges from its MS4 system. BAE Systems and NASSCO

counter that the Port District has failed to demonstrate that all of its current and former tenants have the financial resources to pay their respective fair shares of cleanup costs. They further argue that the cleanup is not progressing, and that a number of dischargers named in the order are not cooperating with the TCAO and, in fact, are contesting its adoption. The City of San Diego, BAE Systems and NASSCO all argue the Port District should be named as a discharger because substantial evidence in the record supports the finding that it is responsible for discharges of relevant COCs from its MS4 system, which discharges have contributed to the condition of pollution or nuisance at the Site. **Because some former Port District Tenants may not have sufficient financial resources to account for their fair shares of cleanup costs, and because the cleanup is not progressing and a number of named dischargers are contesting the TCAO, the Port District should remain a primarily – not a secondarily – responsible party. Moreover, because substantial record evidence supports the finding that the Port District is legally responsible for the discharge of wastes through its MS4 system, it should remain a discharger under the TCAO.**

### **Legal Standards.**

All commentators and the Cleanup Team agree that there must be substantial evidence in the record to support naming the Port District as a discharger. As California’s Supreme Court observed, substantial evidence is evidence of “ponderable legal significance,” which is “reasonable in nature, credible and of solid value.” *Ofsevit v. Trustees of California State Universities and Colleges* (1978) 21 Cal.3d 763, 773, n. 9. “Substantial evidence” means facts, reasonable assumptions based on facts and expert opinions supported by facts. *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4<sup>th</sup> 1004, 1019. Importantly, an agency may also rely on the opinion of its staff in reaching decisions, and “the opinion of staff has been recognized as constituting substantial evidence.” *Browning-Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866 *citing Coastal Southwest Dev. Corp. v. California Coastal Zone Conservation Com.* (1976) 55 Cal.App.3d 525, 535-536.

The Port District faithfully cites governing State Water Board precedent on whether a landowner should be named as primarily, as opposed to secondarily liable, but fails to faithfully apply the facts at hand. It also fails to properly apply the substantial evidence standard with respect to facts in the record, reasonable assumptions based on those facts, and expert and staff opinions based on those facts regarding its responsibility for discharges of relevant COCs from its MS4 system.

### **The Port District Should Remain A Primarily Responsible Discharger Because Of Potential Gaps In Tenants’ Financial Resources.**<sup>1</sup>

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<sup>1</sup> The Port District provides a lengthy discussion of its alleged history of cooperation with the San Diego Water Board on other cleanup projects, as well as its purported cooperation with the TCAO. The arguments in this vein are apparently provided to address the Cleanup Team’s responses to the Port District’s discovery requests regarding changes in circumstances between prior iterations of the TCAO and the current iteration. As NASSCO points out in its rebuttal comments, the DTR does not suggest that the Port was named as a primary discharger because of perceived non-cooperation grounded in the Port’s

The Port District does not dispute that the TCAO establishes the elements for naming it as a discharger under applicable State Water Board landowner liability precedent. *See* DTR, § 11, p. 11-2, n. 102. Rather, it argues that it should be named secondarily liable. A public-agency landowner may be named secondarily liable if, but only if, its current and former tenants have the financial resources to undertake the cleanup *and* those tenants are cooperating with and implementing the applicable cleanup order. *In the Matter of Petitions of Wenwest, Inc., et al., (Wenwest)* State Water Board Order No. WQ 92-13, p. 9; *In the Matter of the Petitions of Arthur Spitzer, et al., (Spitzer)* State Water Board Order No. WQ 89-8, p. 21. As the Presiding Officer for these proceedings has previously articulated, the Port District bears the burden of proving the two elements. 10/27/10 Order Reopening Discovery Period, § III. Importantly, when reviewing the question of whether to name a party as a discharger under a cleanup and abatement order, regional water boards are to name parties to the maximum extent permitted by law. *See* 23 Cal. Code Regs., § 2907; Resolution No. 92-49, § II (A)(4). .

The Port District goes to great lengths to try to demonstrate that its current and former tenants have the financial resources to accomplish the cleanup proposed in the TCAO, introducing insurance policies and stipulations by some of its current tenants into the record. But, even if admissible, these facts are insufficient to meet the Port's burden to establish that each of the Port District's former and current tenants have the financial resources to satisfy their respective fair shares of responsibility. *See In the Matter of Petitions of Aluminum Company of America et al.,* State Water Board Order No. WQ-93-9, pp. 16-18 [where an operator no longer in existence is responsible for cleaning up a site, creating an "orphan share" or liability, the landowner becomes primarily responsible for the orphaned liability].

There is considerable controversy over which, if any, discharger named in the TCAO is responsible for discharges from the current BAE Systems leasehold from 1962 through 1979. BAE Systems contends it is responsible for discharges from 1979 to the present only. Star & Crescent Boat claims it has no responsibility for any discharges at the Site. Campbell Industries, Inc. claims it has responsibility for discharges from 1972 through 1979 only. Thus, even if the Port District could establish that Campbell Industries, Inc. and Star & Crescent Boat have sufficient financial resources to pay their respective fair shares of responsibility, which it cannot, the potential for an orphaned operator share of responsibility still requires the Port District to be named as a primarily responsible party under the State Water Board's guiding landowner liability precedents.

Moreover, the Port District's provision of potential insurance coverage "financial resources" for Star & Crescent Boat and Campbell Industries, Inc., among others, is not evidence of the ability to satisfy cleanup costs. The Port District's summary of potential insurance assets does not and cannot establish; (1) whether the policies summarized actually provide coverage for the cleanup costs; (2) whether the insurer is dissolved or insolvent; (3) whether any policy amounts have been sold back or have already been

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withdrawal from a voluntary mediation. Rather, the Port is named as a primary discharger based on an application of facts in the record to applicable legal precedents governing the issue.

depleted; or (4) whether any insurer has agreed to indemnify the insureds. As BAE Systems points out, it is not surprising this evidence has not been provided by the Port District since the obligation to indemnify an insured for loss does not arise until the insured's underlying liability is established. *See Montrose Chemical Corp. v. Admiral Ins. Co.* (1995) 10 Cal.4<sup>th</sup> 645, 659 n.9. That is, the TCAO must be adopted before insurers actually recognize a potential duty to indemnify.

The Port District also argues that it has indemnity agreements with its tenants which require them to reimburse it for cleanup costs. As NASSCO correctly observes, whether a lease includes an indemnity clause is not determinative as to whether the landlord should be named primarily or secondarily liable. *See In re Wenwest, Inc., supra*, State Water Board Order No. WQ 92-13, pp. 7-9. Here, the indemnity clauses are irrelevant for a number of reasons. First, the Port District has not introduced indemnity agreements into the record for all of its current and former tenants. Second, even assuming, solely *arguendo* that the Port District has iron-clad indemnity agreements with all its current and former tenants, those indemnity agreements are only as good as the current and former tenants are solvent. Accordingly, the indemnity argument resolves nothing since it is unclear whether dissolved corporate dischargers such as Campbell Industries, Inc. and San Diego Marine Construction Company, and successor corporations such as Star & Crescent actually have sufficient financial resources with which to indemnify the Port District.

It bears noting that the issues relating to allocation of fair shares of responsibility for cleanup costs under the TCAO are currently being litigated by the dischargers in federal district court. Based on the current state of the record, it is premature to conclude that all of the Port District's current and former tenants have sufficient financial resources to undertake their respective fair shares of cleanup costs under the TCAO.

### **The Port District Should Remain A Primarily Responsible Discharger Because No Cleanup Is Taking Place.**

Even if it could be demonstrated that the Port District's current and former tenants have the financial resources to undertake the TCAO, it would still be appropriate to name the Port District as a primarily responsible party because no work is progressing on the cleanup, and at least some of the Port District's current and former tenants are not cooperating with or supporting the TCAO. *See In re Spitzer, supra*, at p. 9 [landowner responsible for cleanup if lessor fails to cleanup]; *In re Wenwest, supra*, p. 3. n. 2 [upholding regional board's initial decision to name landowner primarily responsible, but agreeing to change status of landowner to secondarily liable where lessee making progress on cleanup]. The Port District's claim that its current and former tenants are cooperating with and implementing the TCAO is false. As EHC and Coastkeeper continuously point out in these proceedings, the San Diego Water Board has been trying to accomplish a cleanup at the Shipyard Sediment Site for over ten years. So far, no "progress on the cleanup" has taken place. SDGE disputes the TCAO's cleanup levels and its own liability. NASSCO admits to liability, but disputes the alternative cleanup levels. BAE Systems admits to some liability, disputes some liability, and disputes the



alternative cleanup levels. Star& Crescent disputes its liability. The Port District itself argues that the alternative cleanup levels are not stringent enough and the cleanup footprint should be expanded. These facts can in no way be construed as “progress on the cleanup” is being made.”

In sum, based on this record, it is premature to find that the Port District should be secondarily responsible. If the TCAO is successfully adopted and becomes final, and if the Port District’s current and former tenants begin to make “progress on the cleanup” as was the case in *Wenwest*, then and only then may it be time to find the Port District secondarily responsible.

### **Substantial Evidence Supports Naming The Port District As A Discharger Under Its MS4 Permit.<sup>2</sup>**

In addition to the case and statutory law set forth above governing what may constitute substantial evidence, Resolution No. 92-49 further animates the types of evidence that may be considered substantial when naming dischargers in a cleanup and abatement order, including direct or circumstantial evidence. Resolution No. 92-49, § I (A). Such direct or circumstantial evidence includes site characteristics and location in relation to other potential sources of discharge and hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality. *Id.*, at §§ I (A)(2), (3). The Port District claims it does not own or operate any part of the MS4 system that discharges through storm water outfalls SW04 and SW09, and that, even if it did, there is no substantial evidence to support the finding that relevant COCs were discharged through that system. Both arguments fail.

The Port District’s argument that it does not own or operate any of those portions of the MS4 system that outfall through SW04 and SW09 is based on the erroneous assertion that the City of San Diego’s retention of an easement for its MS4 system to pass through the Port District’s tideland properties foisted the responsibility for discharges from the tideland properties onto the City. The Port District is wrong. The City of San Diego correctly observed in its rebuttal comments that the Port District is a unique entity that overlays the City’s jurisdictional boundaries. The Port District has all rights and obligations of inspection and action with respect to the MS4 within its jurisdictional boundaries – namely the tidelands. Indeed, the MS4 permit issued by the San Diego Water Board recognizes this. The City’s easements merely allow its storm drains to pass through the tidelands to drain the upland areas into San Diego Bay. The Port District is fully responsible under the MS4 permit and its agreements with the co-permittees to take all necessary actions to prevent discharges of pollutants into the MS4 system from the tidelands areas, including both public areas *and* those leased to other entities. But, as outlined below, there is substantial evidence that relevant COCs were conveyed by the Port District’s MS4 system to the Shipyard Sediment Site.

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<sup>2</sup> There is some overlap with the discussion in these Response to Comments under Finding 4 relating to the City of San Diego’s responsibility for its discharges from its portion of the MS4 system. Relevant portions of that response are incorporated herein by this reference.

The Port District argues that the DTR's finding that relevant COCs were discharged from the tidelands area to the MS4 system and then into the Site through outfalls SW04 and SW09 is not supported by substantial evidence. The Port District relies heavily on *Natural Resources Defense Council, Inc. v. County of Los Angeles* (9<sup>th</sup> Cir. 2011)(NRDC), 636 F.3d 1235 to support its argument. The case is not on point. NRDC specifically addresses the evidentiary threshold required for finding that an NPDES permittee exceeded the parameters of its permit. That inquiry necessarily requires some quantification of the discharged constituent since some level of discharge is permitted. The TCAO does not allege that the Port District violated its permit. Rather, the inquiry is whether substantial evidence supports the finding that the Port District caused or contributed COCs to the condition of pollution or nuisance at the Shipyard Sediment Site through its discharges from the MS4 system in the tidelands that it owns and operates. Even the NRDC court made it clear that those who convey pollutants to waters of the United States, even if initially "added" by others, are liable under the Clean Water Act. *Id.*, at 1252-1253. As BAE Systems correctly notes, so long as there is substantial evidence, direct or circumstantial, that the Port District caused or contributed to the condition of pollution or nuisance at the Site, it is properly named as a discharger under the TCAO.

Critically, the Port District fails to faithfully cite all of the substantial record evidence, direct and circumstantial, that supports the finding that it is responsible for discharges of relevant COCs through that portion of the MS4 system that lies within the tidelands. .

First, the Port District admits that it has "limited" storm water collection facilities that are not part of its tidelands properties leased to tenants and that lead to SW04. *See* Declaration of Robert Collacott, p. 4:9-14 [Port District operates one half mile of street curb and gutter, four storm drain inlets and an estimated 770 feet of underground storm drains 24-inches in diameter and smaller that drain to SW04].<sup>3</sup> It must be noted that the Port District's attempt to limit the MS4 system for which it is responsible to that which is not part of its tidelands leases to other entities is improper. The Port District is responsible for all storm water runoff collected from the tidelands area, whether it falls outside or within one of its leaseholds. The Port District's Jurisdictional Urban Runoff Management Plan (JURMP) admits the MS4 facilities, such as the one described by its Robert Collacott, have the potential to generate pollutants, including bacteria, gross pollutants, metals, nutrients, oil and grease, organics, pesticides, sediments and trash. May 2008 JURMP, Table 6-2. All of these pollutants can reach the MS4 system with each rainfall event and, in turn, be carried to receiving water bodies. *Id.*, at p. 6-7. U.S. EPA documents cited by BAE Systems further establish that heavy metals, particularly copper, lead and zinc are priority pollutants found in urban runoff and total suspended solids are high in comparison to other point source discharges. This evidence is incorporated herein by this reference as if set forth in full. These pieces of evidence

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<sup>3</sup> NASSCO notes that despite the ability to do so, the Port District fails to provide a GIS-based map that would show that storm water is not collected from the tidelands area and discharged through SW09. The TCAO alleges that it is. Because of the site characteristics of the area, it is reasonable to infer that SW09 does drain urban runoff from industrial facilities in the tidelands area leased by the Port District to others. As discussed above, it is also reasonable to assume that such runoff contains relevant COCs.

constitute circumstantial evidence of the Port District's contribution of relevant COCs to the Site. Stated somewhat differently, the evidence supports a finding that relevant COCs are commonly discharged in urban runoff, and that the Port District operates a conveyance at Belt Street that presents a plausible pathway for those COCs to be discharged.

Second, the Port District's leasehold to BAE Systems, which is within its jurisdictional tidelands area, directly overlies the SW04 outfall at the Shipyard Sediment Site. As the DTR already documents, relevant COCs, including PCBs and PAHs have been detected in the SW04 catch basin and laterals entering the catch basin. In 2009, samples were collected from a manhole on BAE's property that drains directly through SW04. The samples established the presence of PCBs, copper, mercury and TBT. In 2005, as described in the DTR, samples taken from the catch basin on the north side of Sampson Street between Belt Street and Harbor Drive (that portion over which the Port District admits responsibility) tested positive for PCBs and PAHs. This is direct evidence of COCs being present in the Port District's Belt Street MS4 conveyance, for which it admits responsibility. In 2001, water quality data was collected from the first manhole inside the BAE Systems leasehold that drains to SW04, which samples contained TBT, copper and mercury. It is reasonable to assume, based on the "site characteristics" (Resolution No. 92-49 I (A)(2)) and these facts documenting the detection of relevant COCs in manholes directly upgradient from the SW04 outfall, that COCs were discharged through SW04 after having been collected from the tidelands area. This makes the Port District a responsible party under *NRDC* because it is responsible for conveying wastes through its MS4 system to the Site.

As counsel for SDG&E, Jill A. Tracy notes in SDG&E's June 23, 2011 Rebuttal, "the state and regional boards are precluded from apportioning responsibility for remedial activities under a CAO." 6/23/11 SDG&E Rebuttal, pp. 10-11. Ms. Tracy argues that if the San Diego Water Board were to rescind its designation of the Port District as a named discharger under the TCAO, it would "become engaged in a *de facto* allocation of harm." *Id.* Whether the Port District should be named primarily responsible as a landowner, or whether it is entitled to indemnity from its current and former lessees for storm water and/or other discharges of relevant COCs, to the extent those entities are still viable, is best decided in an allocation proceeding such as the current federal litigation, not in this administrative forum. Accordingly, the Port District should remain a named discharger under the TCAO.

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## **12. TCAO Finding 12 and DTR Section 12: Clean Water Act Section 303(d) List**

Finding 12 of CAO No. R9-2011-0001 states:

The San Diego Bay shoreline between Sampson and 28th Streets is listed on the Clean Water Act section 303(d) List of Water Quality Limited Segments for elevated levels of copper, mercury, zinc, PAHs, and PCBs in the marine sediment. These pollutants are impairing the aquatic life, aquatic-dependent wildlife, and human health beneficial uses designated for San Diego Bay. The Shipyard Sediment Site occupies this shoreline. Issuance of a CAO (in lieu of a Total Maximum Daily Load program) is the appropriate regulatory tool to use for correcting the impairment at the Shipyard Sediment Site.

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The San Diego Water Board did not receive any comments regarding Finding 12 and DTR Section 12.

### **13. TCAO Finding 13 and DTR Section 13: Sediment Quality Investigation**

Finding 13 of CAO No. R9-2011-0001 states:

NASSCO and BAE Systems conducted a detailed sediment investigation at the Shipyard Sediment Site in San Diego Bay within and adjacent to the NASSCO and BAE Systems leaseholds. Two phases of fieldwork were conducted, Phase I in 2001 and Phase II in 2002. The results of the investigation are provided in the Exponent report *NASSCO and Southwest Marine Detailed Sediment Investigation, September 2003 (Shipyard Report, Exponent 2003)*. Unless otherwise explicitly stated, the San Diego Water Board's finding and conclusions in this CAO are based on the data and other technical information contained in the Shipyard Report prepared by NASSCO's and BAE Systems' consultant, Exponent.

The Shipyard Sediment Site is exempt from the Phase I Sediment Quality Objectives promulgated by the State Water Resources Control Board (State Water Board) because a site assessment (the Shipyard Report) was completed and submitted to the San Diego Water Board on October 15, 2003. See State Water Board, *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality*, II.B.2 (August 25, 2009).

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The San Diego Water Board received a secondary comment from Coastkeeper and EHC on DTR Section 13 that was part of a broader comment on DTR Section 33. Please refer to Response 33.1 in this report for the comment and response concerning the sufficiency of the number of samples in the Sediment Quality Investigation.

## 14. TCAO Finding 14 and DTR Section 14: Aquatic Life Impairment

Finding 14 of CAO No. R9-2011-0001 states:

Aquatic life beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. Aquatic life beneficial uses include: Estuarine Habitat (EST), Marine Habitat (MAR), and Migration of Aquatic Organisms (MIGR). This finding is based on the considerations described below in this *Impairment of Aquatic Life Beneficial Uses* section of the CAO.

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### RESPONSE 14.1

**DTR Sections:** 14 to 28

**Comment Submitted By:** NASSCO

**Comment ID:** 158

#### **Comment**

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Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

The Regional Board is authorized to adopt CAOs based only on sound scientific evidence that a potentially responsible party has “discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance . . . .” Cal. Water Code §13304(a) . Here, Staff alleges that NASSCO “caused or permitted the discharge of waste to the Shipyard Sediment Site, resulting in an accumulation of waste in the marine sediment [that] has caused conditions of contamination or nuisance in San Diego Bay that adversely affect aquatic life, aquatic-dependent wildlife, human health, and San Diego Bay beneficial uses.” TCAO, at ¶ 1. However, extensive scientific investigation conducted at the Site, including the sediment quality investigation upon which the findings and conclusions of the TCAO are purportedly based, indicates that beneficial uses at the Site are not unreasonably impaired and that active remediation, beyond monitored natural attenuation, is not warranted. Exponent Report, at 19-12 – 19-13; TCAO, at ¶ 13.

The Sediment Investigation Was Extensive and Unparalleled (Finding 13)

As documented in the TCAO and DTR, Staff’s findings are based primarily upon the results of a “detailed” sediment investigation that was conducted at the site in 2001 and 2002 by NASSCO and BAE Systems San Diego Ship Repair Facility (“BAE Systems”), under the direction and supervision of staff. The investigation included sampling of five reference areas selected by Regional Board staff and fifteen triad stations within NASSCO’s leasehold alone, resulting in a comprehensive data set that measured sediment chemistry, sediment toxicity, benthic macroinvertebrate communities, bioaccumulation in fishes and invertebrates, and fish health using multiple independent indicators. Evaluation of Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 for the NASSCO Shipyard Sediment Site, Expert Report of Thomas C. Ginn, Ph.D. (“Ginn Report”), at 11-12. For each sampling station,

synoptic measurements were made of sediment chemistry, sediment toxicity, and the structure of benthic macroinvertebrate communities. Id. Sediment toxicity was evaluated using three different toxicity tests, and the structure of benthic macroinvertebrate communities was assessed by analyzing five replicate samples from each station. Id. In addition, bioaccumulation was measured in invertebrates and fish that are prey to aquatic-dependent wildlife, and fish health was assessed by comparing the condition of 100 fishes caught at, and near the NASSCO leasehold, across a variety of indicators, including weight, length, age, and microscopic evaluation of organs for evidence of lesions or other abnormalities. Id. As a result, the investigation—which was conducted with substantial oversight and input from Staff, stakeholders, and the public—contains ample site-specific evidence, and has been described by Staff as “the most extensive sediment investigation ever conducted for a site in San Diego Bay,” if not California. Exponent Report, at 1-2 – 1-4 (summarizing the directives and guidance provided by Regional Board staff throughout the planning and execution of the sediment investigation and Exponent Report); Deposition of David Barker (“Barker Depo”), at 80:2 – 80:22, 82:3 – 82:4, 2:14 – 83:23 (discussing the scope, quality, and Staff involvement in the sediment investigation); DTR, at 13-2 – 13-3 (summarizing Staff and stakeholder involvement in the sediment investigation).

The results of this extensive and unparalleled investigation, as discussed in detail below, found that risks to human health and aquatic-dependent wildlife at the shipyards “are well within acceptable levels” and that the sediment toxicity and adverse effects on benthic communities observed at certain locations are attributable to pesticides, not metals, butyltins, PCBs, or PAHs. Exponent Report, at 19-1. Moreover, the report found that aquatic life, aquatic-dependent wildlife, and human health beneficial uses are at approximately 95 percent of ideal conditions, and that any benefits from active remediation, such as dredging, would provide minimal incremental benefit at a very high cost. Id. at 19-13. As a result, the report concluded that “monitored natural recovery is therefore the most technically and economically feasible approach to addressing current sediment conditions at the shipyard.” Id. Yet, despite the favorable results and recommendations from this comprehensive multimillion dollar sediment investigation, overseen by Regional Board Staff, the Cleanup Team now seeks to require large-scale dredging of sediments within, and adjacent to, NASSCO’s leasehold to achieve cleanup levels that are unprecedented in San Diego Bay. This aggressive approach violates the legal principles embodied in Section 13304 and Resolution 92-49, is contrary to existing scientific and technical evidence, and is not supported by the record.

### **Response: 14.1**

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In January 1991, the San Diego Water Board Executive Officer requested NASSCO and Southwest Marine (now BAE Systems), to participate in a sediment study to determine the quality of sediment within their respective leaseholds, areal extent of contamination, and appropriate cleanup levels. From that date the San Diego Water Board has been engaged in a long and difficult process to obtain sufficient information upon which to base decisions regarding the cleanup of the contaminated Shipyard Sediment Site.

Between the years 2001 to 2003, NASSCO and BAE Systems conducted a detailed sediment investigation at the Shipyard Sediment Site within and adjacent to their respective leaseholds with Phase I conducted in 2001 and Phase II conducted in 2002. The results of the investigation

are provided in the Shipyard Report (Exponent 2003). Although the conclusions and recommendations of this industry funded report were that the San Diego Water Board should not require any cleanup of the sediments, many of the findings and conclusions of the TCAO and DTR are based on the data and other technical information contained in the report.

The final electronic administrative record supporting the TCAO and DTR assembled by the Cleanup Team consists of over 375,000 pages of information pertaining to the various parties and is fully indexed, text searchable, and available for use by both the tentatively named responsible parties and other interested parties, including nongovernmental environmental organizations. The extraordinary efforts of the Cleanup Team to prepare, assemble and make this record available to the parties were unprecedented and driven in large measure by vigorous and continuing resistance of the tentatively named responsible parties to undertake any cleanup at the site.

NASSCO continues to argue, as it has for many years now, that the contaminants accumulated in the sediment at the Shipyard Sediment Site, which are attributable in part to NASSCO'S discharges, do not cause pollution conditions. NASSCO also continues to argue for no-action or passive remediation alternatives. NASSCO is wrong. Based on the substantial record the Cleanup Team has concluded that aquatic life, aquatic dependent wildlife and human health beneficial uses are unreasonably impaired at the Shipyard Sediment Site and that cleanup should occur. The technical analysis addressing beneficial use impairment at the Shipyard Sediment Site is contained in DTR Sections 14 through 28. Cleanup Team responses to NASSCO's many specific comments on the TCAO and DTR conclusions regarding beneficial use impairment are contained in the Response to Comment Sections 15 and 18 for Aquatic Life Beneficial Uses, Section 24 for Aquatic-Dependent Wildlife Beneficial Uses, and Sections 25, 27, and 28 for Human Health Beneficial Uses.

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## **15. TCAO Finding 15 and DTR Section 15: Multiple Lines of Evidence Weight-of-Evidence Approach**

Finding 15 of CAO No. R9-2011-0001 states:

The San Diego Water Board used a weight-of-evidence approach based upon multiple lines of evidence to evaluate the potential risks to aquatic life beneficial uses from pollutants at the Shipyard Sediment Site. The approach focused on measuring and evaluating exposure and adverse effects to the benthic macroinvertebrate community and to fish using data from multiple lines of evidence and best professional judgment. Pollutant exposure and adverse effects to the benthic macroinvertebrate community were evaluated using sediment quality triad measurements, and bioaccumulation analyses, and interstitial water (i.e., pore water) analyses. The San Diego Water Board evaluated pollutant exposure and adverse effects to fish using fish histopathology analyses and analyses of PAH breakdown products in fish bile.

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### **RESPONSE 15.1**

**DTR Section:** 15

**Comment Submitted By:** NAASCO

**Comment ID:** 148

#### **Comment**

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Any potential negative effects from Shipyard contaminants are not observed in fish beyond the leasehold. The DTR employed a weight-of-evidence approach to evaluate the exposure to and potential for adverse impacts from the Shipyard Site. As part of this approach, the DTR analyzed the tissue concentrations of contaminants of concern in fish caught inside the NASSCO leasehold, and compared them to concentrations in fish caught outside the leasehold and in reference conditions in San Diego Bay. (See DTR, at Table 28-9.). The results demonstrated that there was no significant difference in the level of tissue concentrations for contaminants of concern between fish caught inside the NASSCO Shipyard, and at reference areas around San Diego Bay. Rather, mercury in fish captured within the NASSCO leasehold was actually lower than reference conditions, and are not impacted for mercury at unsafe levels. (See DTR, at Table 28-9). In fact, the mercury levels of fillets from fish caught within the leasehold satisfy EPA's recommended guidance threshold for what constitutes "lower levels of mercury in fish." Additionally, the mean chemical concentrations measured in the edible fish tissues collected inside the NASSCO leasehold were not statistically different from those measured outside (but adjacent to) the leasehold. Similarly, the mean chemical concentrations in fish caught outside (but adjacent to) the leasehold were not statistically different from those caught at reference stations, which were specifically selected to represent background conditions. Thus, the fish tissue concentrations observed in fish did not vary significantly by location, suggesting that (1) spotted sand bass at the Site meet regional background conditions and (2) shipyard chemicals do not adversely affect fish inside, or beyond, the leasehold.

#### **Response 15.1**

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The comment is correct that the DTR employed a weight-of-evidence approach to evaluate the impairment of beneficial uses at the Shipyard Site. However, the comment subsequently takes a different approach in evaluating the tissue data, specifically focusing the argument on (1) spotted

sand bass and (2) fillet concentrations, which provide favorable results for the comment's line of reasoning. While fillet concentrations may well represent recreational human consumption, as the comment is citing section 28 of the DTR, it is not reasonable to assume that the fillet represents the health of an individual fish or that potential predators (see Table 24-5) would fillet the fish prior to consumption. Furthermore, in a weight-of-evidence approach, the spotted sandbass fillets should not be the only consideration when assessing aquatic-dependent wildlife, as they are not the only aquatic species that utilize the site or are present in the bay food web. Again, this is reflected in the Tier II Assessment for Aquatic Dependent Wildlife, which utilizes 5 species, including an invertebrates and eelgrass. The Cleanup Team also utilized a different approach in evaluation of the concentration data (see Response 28.1 for more information).

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## RESPONSE 15.2

**DTR Section:** 15

**Comments Submitted By:** NASSCO

**Comment IDs:** 266, 490

**Comment**

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**Survey of lesions in fish show a greater prevalence of lesions in fish caught in reference areas than in fish caught at NASSCO.** Because no adverse effects to fish can be associated with specific chemical concentrations in the sediment, it would be inappropriate to derive specific chemical-based cleanup levels from the fish histopathology data in the DTR (Exponent 2003, p. 9-22). The DTR therefore correctly concludes that "the fish histopathology data does not indicate that the fish lesions observed in the data set can be conclusively attributed to contaminant exposure at the Shipyard Sediment Site." (DTR, Appendix for Section 15).

Overall, however, the results of the fish histopathology analysis do suggest that spotted sand bass are not adversely affected by chemicals present in the sediments, water, or prey at NASSCO. For example, as indicated above, the growth and condition of spotted sand bass near the shipyards were comparable to fish in reference areas. The survey also revealed a greater prevalence of lesions in fish caught in reference areas than in fish caught at the shipyards (i.e., the total number of lesions that were significantly elevated was greater in fish caught at the reference sites than caught at the shipyards). Exponent Report, at 9-22. Of the 70 lesions evaluated the incidence of only four were considered as being significantly elevated near the shipyards, whereas the incidence of six were significantly elevated at reference areas, when compared with one or more shipyard sites. Additionally, most of the lesions found in shipyard fish were "mild," and the pathologist observed no serious liver lesions of the types commonly associated with contaminated sites. Taken together, these results indicate that sediments at the shipyard do not pose risks to aquatic life.

**Any potential negative effects from Shipyard contaminants are not observed in fish beyond the leasehold.** In addition to assessing chemical concentrations in fish tissue, the DTR also analyzed fish histopathology results for fish caught (1) inside the leasehold, (2) just outside the leasehold, and (3) at reference stations. These data corroborated the results of the fish tissue analysis, and found that fish inside the leasehold were "healthy, with no elevation in significant liver lesions or other abnormalities related to chemical exposures at the site." As discussed previously in Section IV.a.2.b.(4), a conservative analysis of the results showed that only four of

the 70 lesions were evaluated were found to be significantly elevated in shipyard fish (compared to six of 70 in reference fish). The results also indicated that the health of spotted sand bass was not adversely affected by proximity to the shipyards, and that fish caught just outside, but adjacent to, the NASSCO leasehold were generally no different from reference fish, with respect to both microscopic and macroscopic fish lesions. DTR, App. 15, at 15-8 – 15-9, Table A15-5. In fact, only one of the 70 types of lesions evaluated was found to be significantly elevated in fish caught just outside the NASSCO leasehold, compared to reference fish. DTR, at Tables A15-4 and A15-5. Accordingly, these results suggest that, even if there are potential negative effects on fish within the leasehold, shipyard contaminants are not affecting fish beyond the leasehold and potentially contaminated fish are not migrating beyond the leasehold.

### **Response 15.2**

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The Cleanup Team agrees with some aspects of NASSCO's comment regarding survey of lesions in fish, but disagrees with other aspects. The Cleanup Team does not agree that the data suggest that spotted sand bass are not adversely affected by chemicals present in the shipyards. NASSCO's comment does not characterize the full findings of the Shipyard Report (Exponent 2003) or the supporting March 25, 2003 Histopathology Report entitled "*Necropsy and Histopathology of Spotted Sand Bass Sampled from San Diego Harbor in September 2002*" (See SAR280360), and only focuses on the total number and "severity" of individual lesions as ranked on a 1-4 scale. The comment does not include a discussion of the potential significance of the lesions documented, nor does it discuss the possible causes (see DTR Appendix for Section 15 and 2003 Histopathology report). The DTR findings and 2003 Histopathology Report do suggest differences between sites that may be attributable to chemical exposure pathways. However, the comment is correct in that observed conditions in spotted sand bass cannot be directly attributed to shipyard pollutants. It is important to note, however, that the DTR Findings were taken out of context in the comment. The purpose of the fish histopathology study was not to determine a cause-and-effect between shipyard pollutants and fish condition, but to provide an additional assessment of biologic conditions for evaluation in a weight-of-evidence approach.

With regards to NASSCO'S comment on the potential negative effects in fish beyond the leasehold, the Cleanup Team does not agree with the assertion that fish within the shipyard site were "healthy". Contrary to NASSCO's assertion, the 2003 Histopathology Report (See SAR280360) does not conclude that fish within the shipyard site were "healthy". In fact, the report concluded on Page 8, in **Results and Significance**, that more fish from inside shipyard sites had evidence of tissue damage than did fish from outside the shipyard sites.

NASSCO'S also argues that "even if there are potential negative effects on fish within the leasehold, shipyard contaminants are not affecting fish beyond the leasehold and potentially contaminated fish are not migrating beyond the leasehold." While this may well be the case, this does not provide sufficient evidence to show that beneficial uses are not unreasonably impaired at the Shipyard Sediment Site, nor does it invalidate the Tier II aquatic-dependent wildlife results, which made specific assumptions regarding predator foraging whose purpose are laid out in the DTR Section 24.2.6. These assumptions are reasonable and consistent with Resolution No. 92-49. Lastly, it is important to again note that the spotted sand bass was only one of five species in the Tier II analysis.

### **RESPONSE 15.3**

**DTR Section:** 15

**Comments Submitted By:** NASSCO

**Comment ID:** 267

**Comment**

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The DTR correctly concludes that “the [fluorescent aromatic compound] concentrations observed in the fish collected cannot be conclusively attributed to contaminant exposure at the Shipyard Sediment Site.” (DTR, p. A15-14). In fact, fish bile analyses conducted at the Site suggest that fish at the shipyards are no more greatly exposed to PAHs than fish at other locations in San Diego Bay. Exponent (2003, at p. 8-49). No statistically significant differences in PAH breakdown products were found at the shipyards relative to the reference location, and concentrations of bile breakdown products in fish from within the Site were generally less than concentrations in fish from outside the leaseholds. Taken together, these data support the conclusion that that Site sediments are not impairing aquatic life beneficial uses. (Exponent 2003, at xxxiii, p. 8-49).

**Response 15.3**

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The Cleanup Team does not agree that the data, when taken together, support the conclusion that shipyard site sediments are not impairing aquatic life beneficial uses. The Cleanup Team found the data collected for fish bile to be inconclusive after conducting additional statistical evaluations beyond those cited in Exponent (2003, at p. 8-49), and when considering potential confounding factors associated with the species and testing.

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## **16. TCAO Finding 16 and DTR Section 16: Sediment Quality Triad Measures**

Finding 16 of CAO No. R9-2011-0001 states:

The San Diego Water Board used lines of evidence organized into a sediment quality triad, to evaluate potential risks to the benthic community from pollutants present in the Shipyard Sediment Site. The sediment quality triad provides a “weight-of-evidence” approach to sediment quality assessment by integrating synoptic measures of sediment chemistry, toxicity, and benthic community composition. All three measures provide a framework of complementary evidence for assessing the degree of pollutant-induced degradation in the benthic community.

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The San Diego Water Board received secondary comments from NASSCO on DTR Section 16 that was part of a broader comment on DTR Section 18. Please refer to Response 18.1 in this report for the comment and response concerning the Triad weight-of-evidence results for the Shipyard Sediment Site stations.

## 17. TCAO Finding 17 and DTR Section 17: Reference Sediment Quality Conditions

Finding 17 of CAO No. R9-2011-0001 states:

The San Diego Water Board selected a group of reference stations from three independent sediment quality investigations to contrast pollution conditions at the Shipyard Sediment Site with conditions found in other relatively cleaner areas of San Diego Bay not affected by the Shipyard Sediment Site: (1) Southern California Bight 1998 Regional Monitoring Program (Bight 98), (2) 2001 Mouth of Chollas Creek and Mouth of Paleta Creek TMDL studies, and (3) 2001 NASSCO and BAE Systems Detailed Sediment Investigation. Stations from these studies were selected to represent selected physical, chemical, and biological characteristics of San Diego Bay. Criteria for selecting acceptable reference stations included low levels of anthropogenic pollutant concentrations, locations remote from pollution sources, similar biological habitat to the Shipyard Sediment Site, sediment total organic carbon (TOC) and grain size profiles similar to the Shipyard Sediment Site, adequate sample size for statistical analysis, and sediment quality data comparability. The reference stations selected for the Reference Sediment Quality Conditions are identified below.

### Reference Stations Used To Establish Reference Sediment Quality Conditions

2001 Chollas/Paleta Reference Station Identification Number	2001 NASSCO/BAE Systems Reference Station Identification Number	1998 Bight'98 Reference Station Identification Number
2231	2231	2235
2243	2243	2241
2433	2433	2242
2441	2441	2243
2238		2256
		2257
		2258
		2260
		2265

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The San Diego Water Board received a secondary comment from NASSCO on DTR Section 17 that was part of a broader comment on DTR Section 18. Please refer to Response 18.1 in this report for the comment and response concerning the grain size and total organic carbon differences between the Site stations and the reference pool stations.

## **18. TCAO Finding 18 and DTR Section 18: Sediment Quality Triad Results**

Finding 18 of CAO No. R9-2011-0001 states:

The San Diego Water Board categorized 6 of 30 sediment quality triad sampling stations at the Shipyard Sediment Site as having sediment pollutant levels “Likely” to adversely affect the health of the benthic community. The remaining triad stations were classified as “Possible” (13) and “Unlikely” (11). These results are based on the synoptic measures of sediment chemistry, toxicity, and benthic community structure at the Shipyard Sediment Site.

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### **RESPONSE 18.1**

**DTR Section:** 18

**Comments Submitted By:** NASSCO, BAE Systems, Coastkeeper and EHC (1 comment)

**Comment IDs:** 119, 261, 407, 462, 481

#### **Comment**

Staff’s framework is replete with excessively conservative assumptions and structural biases towards finding impairment to aquatic life. As a result, the conclusions in the TCAO are not reflective of the true condition of the Site, and lead to an overly conservative result, which should instead have been based upon a realistic site-specific risk assessment, as is required under Section 13304 and Resolution 92-49.

Although the use of a weight of the evidence assessment based upon multiple lines of evidence (MLOE) is a generally accepted approach to evaluating sediment quality, the particular weight of the evidence framework described in the DTR does not follow accepted standards of practice for sediment assessments, resulting in a consistent bias in favor of finding impairment. Because any weight of the evidence analysis necessarily requires the use of “best professional judgment,” accuracy is dependent upon the expertise of the personnel interpreting the data, and may be flawed if based on unreasonable assumptions, or manipulation of the individual lines of evidence (“LOE”) used in the analysis.

The excessively conservative assumptions and structural biases towards finding impairment to aquatic life include:

1. **Undue Weight on Sediment Chemistry LOE (Comment ID 117 and 282).** The MLOE analysis supporting the TCAO is inconsistent with other published decision frameworks, and places undue emphasis on the sediment chemistry line of evidence in violation of sound scientific and technical principles. Specifically, the TCAO and DTR framework is fundamentally flawed because it concludes that adverse effects on benthic macroinvertebrates are “likely” or “possible” whenever sediment chemistry is characterized as “high”—regardless of whether significant sediment toxicity or adverse effects on benthic invertebrates are also observed. DTR, at Table 18-4. As a result, the chemistry line of evidence unilaterally trumps the others, causing the TCAO and DTR reach conclusions about conditions at the Site that are not technically justified. Staff’s framework is further biased by its lack of a “no” effects category – meaning that stations

will be characterized as having at least “low” levels of effects, even where results are indistinguishable from reference conditions – contrary to methods published by others, including the State Water Resources Control Board.

Another major flaw with the WOE approach used in the DTR is the failure to give the benthic community leg of the Triad more weight than the sediment chemistry and sediment toxicity legs, since the benthic evaluations at the Site directly addressed the potential effects of chemical contamination in in-place sediments on the native benthic macroinvertebrates that reside at the site. The benthic analyses are therefore the most relevant leg of the Triad for assessing effects on the in situ benthic macroinvertebrate communities at the Site.

The failure of the DTR to give the benthic community leg of the Triad more weight than the sediment chemistry and sediment toxicity legs, ignored the greater importance of that leg, as documented in Bay et al. (2007b) and CWSWRCB (2009), and led to an overly conservative assessment that gave unwarranted weight, in particular, to the sediment chemistry leg of the Triad.

2. **Grain Size and Total Organic Carbon Differences (Comment ID 474).** Sediment chemistry results at NASSCO are overstated because the reference pool does not accurately represent the chemical and biological conditions at the shipyards in the absence of site-related discharges. This is because reference stations (1) contain coarser sediments, (2) more organic carbon, and (3) tend to be located far from the shoreline (and associated generalized sources of contaminants). For these reasons, some of the elevated chemistry and apparent effects detected in toxicity tests and benthic community analyses likely are attributable to differences between reference and shipyard sediments that are unrelated to shipyard discharges. The TCAO is therefore overly conservative in assuming that all observed differences from reference result from shipyard discharges.
3. **Toxicity Preponderance of Evidence (Comment ID 262).** The DTR is overly-conservative because it concludes that there are impacts on aquatic life, even though the preponderance of sediment toxicity results show that Site sediments are nontoxic. In fact, sediment toxicity at NASSCO is not only objectively low, but also lower than most other locations in San Diego Bay (as well as most other bays and estuaries nationwide). Of 42 total toxicity tests conducted (excluding NA22), 37 tests showed conditions at NASSCO were as protective as background, with respect to toxicity.
4. **Bivalve Larval Development Test (Comment ID 118).** The results of the bivalve larvae sediment toxicity test are given an inappropriate amount of weight in the Triad analysis. The bivalve larvae test indicates that Site sediments do not pose risks to aquatic life, because the results showed that 10 of 15 stations had high percentages of normal larvae that exceeded the reference range. Although the remaining 5 stations were below reference, the two other toxicity tests showed that amphipod survival and sea urchin fertilization were not significantly different from reference for those stations. These latter indicators should be given more weight because of the experimental nature and



variable results of the bi-valve larvae tests, both within replicates at the Site stations and at reference stations.

5. **Amphipod Survival Test (Comment ID 263).** The amphipod survival test, which is the most reliable and widely-used of the three toxicity tests conducted, indicates that Site sediments do not pose risks to aquatic life. DTR, at Table 18-8. Amphipod toxicity was found at only 1 of 15 stations measured at NASSCO (NA11). DTR, at Table 18-8.

It is overly conservative to conclude that NA 11 is “moderately” toxic based solely upon the amphipod survival result described above, when six of the seven direct lines of evidence show that NA11 is equivalent to reference, and the single line of evidence not meeting the reference condition differs by only a few percentage points.

6. **Echinoderm Fertilization Test (Comment ID 264).** The echinoderm fertilization test indicates that Site sediments do not pose risks to aquatic life, because the results showed that there were no statistically significant differences between background reference conditions and Site sediment with respect to sea urchin fertilization. DTR, at Table 18-8.
7. **Benthic Community Preponderance of Evidence (Comment ID 268).** In sum, nearly all of the benthic macroinvertebrate sampling stations at NASSCO show no adverse effects when compared with reference conditions based on the DTR assessment (and one of the two stations showing effects was inappropriately classified based on one metric). Multiple measures indicate that there are healthy benthic macroinvertebrate communities at the Site, with the possible exception of one station located adjacent to Chollas Creek. Accordingly, the direct assessment of benthic macroinvertebrate communities at NASSCO directly refutes the conclusion in the DTR that some areas at NASSCO have “likely” or “possible” effects on benthic macroinvertebrates as a result of shipyard discharges.
8. **Sediment Profile Images (Comment ID 138).** Photographs of sediments at the Site provide additional direct confirmation that the benthos is mature and thriving. Exponent Report, at 8-5. In addition to benthic community analyses, sediment profile images were collected throughout the Site and at reference stations. Exponent Report, at Appendix A. These photographs confirm the presence of mature benthic communities at the Site, and refute Staff’s conclusions that benthic macroinvertebrates at the Site are impaired.
9. **Number of Taxa (Comment ID 137).** The benthic community analyses indicate that the number of taxa in Site sediments is not significantly different from reference. DTR, at Table 18-12. The only station to show statistically significant differences from reference with respect to number of taxa is NA22. The number of taxa at NA20 was incorrectly identified as statistically different, despite falling within the reference range. Accordingly, with the minor exception of NA22, which is not part of the cleanup footprint, none of the stations at NASSCO differed significantly from reference in terms of number of taxa.

10. **Assemblages of Organisms (Comment ID 136).** The benthic community analyses indicate that the assemblage of organisms in Site sediments is not significantly different from reference. DTR, Table 18-12. If substantial alterations of benthic communities were occurring, one would expect to see sparse communities, comprised of the few organisms and taxa able to tolerate chemical toxicity; however, such conditions were not observed at any of the NASSCO stations. Exponent Report, at 8-38. Instead, communities at the Site are similar to communities in reference areas. Exponent Report, at 8-8. Of particular note, the number of crustaceans, which are known to be especially sensitive to sediment pollutants, are present in similar percentages at Site and reference stations, and the overall abundance of benthic macroinvertebrates in Site and reference stations are not statistically different.
11. **Multiple Statistical Comparisons (Comment ID 140).** Staff's failure to adjust for multiple statistical comparisons is excessively conservative because it increases the probability of false-positive results. As a result, some of the apparently significant results for toxicity and benthic community comparisons in the DTR may be erroneous, since failure to adjust for multiple comparisons across 15 comparisons for each toxicity and benthic community metric at NASSCO results in a 54% probability that at least one apparently significant result will occur as a result of chance alone.
12. **Site-Specific Bioavailability (Comment ID 116, 260, 461, and 463).**

**Site-Specific Bioavailability of Chemicals is Not Adequately Addressed (NASSCO and BAE Comments).** Another key flaw in Staff's weight of the evidence approach is the absence of an evaluation of the chemical bioavailability information in Staff's decision framework, which the EPA has recognized as "critical" to the success of weight of the evidence assessments. Rather than using causal criteria to determine whether site contaminants are bioavailable, the DTR improperly equates high concentrations of chemicals with possible impacts to aquatic life. DTR, at Table, 18-1. Specifically, the DTR simply assumes that site chemicals are bioavailable, and causing adverse impacts to aquatic life, when chemistry exceeds empirical Sediment Quality Guidelines ("SQGs"), or when any statistically significant difference from reference is observed in toxicity tests. DTR, at 16-1, 18-3. Staff's failure to consider the bioavailability of chemicals at the Site is both "unscientific" and inconsistent with current standards of practice for sediment assessments.

The DTR recognizes that causal criteria are preferred in the assessment of sediments, but concludes that contaminants in the sediment are bioavailable using empirical Sediment Quality Guidelines, without applying causal criteria that consider bioavailability. Using empirical SQGs based on total sediment pollution concentrations as screening levels, rather than causal SQGs, can lead to inaccurate risk predictions because empirical SQGs often mischaracterize sediments as toxic when they are not, and vice versa, and are not predictive of toxicity.

Staff's failure to consider bioavailability in the DTR is arbitrary and capricious, especially in light of the fact that toxicity and benthic community test results do not show

significant impacts to aquatic life. Without an appropriate bioavailability analysis, Staff's assumption that contaminants are bioavailable based on empirical SQGs, and the corresponding conclusion that aquatic life at the Site is therefore impaired, are unjustified—particularly in light of Staff's recognition that direct evidence, including toxicity and benthic community data, suggest that contaminants are, in fact, not bioavailable.

**The DTR Sufficiently Addressed Bioavailability (Coastkeeper & EHC Comments).**

Bioavailability is often assessed via modeling of the ratio of the acid-volatile sulfide content of sediment versus the simultaneously extracted metal concentration (AVS-SEM). While the Exponent Report does contain AVS-SEM data, other external experts in sediment chemistry and assessment have determined that this data is “largely unusable.” See Letter from Russell Fairey to San Diego Regional Water Quality Control Board dated June 17, 2002 SAR 065523. While bioavailability is one of many possible and useful tools used to ascertain risk to aquatic organisms, it is not the only tool. In fact, the state-approved guidelines for assessing sediments do not rely on determining bioavailability with modeling approaches like the AVS-SEM approach. See Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1. Sediment Quality, State Water Resources Control Board, 2009.

More importantly, Regional Board staff elected to rely on evidence of bioaccumulation in *Macoma nasuta*, a standard test organism used to evaluate whether chemicals in sediments can be taken up by organisms. In other words, staff chose a direct measurement of bioavailability – the extent to which a living organism accumulates chemicals in their tissues – as opposed to a model (AVS-SEM) to evaluate bioavailability.

**Response 18.1**

DTR Sections 16, 17 and 18 describe a weight of evidence (WOE) framework for integrating chemical concentration, sediment toxicity, and benthic infaunal community condition lines of evidence (LOE) to create a station assessment. The use of a WOE assessment based upon multiple lines of evidence (MLOE) is a well accepted approach recognized by U.S. EPA (See SAR283146 and SAR283124) and is considered to be a standard method for qualitatively assessing the relationship between chemical concentrations and biological effects. The Triad WOE framework approach is also an integral sediment quality tool used to assess sediment quality under the State Water Board's Bays and Estuaries Plan. As discussed in further detail in the responses below the DTR WOE framework was developed based on sound scientific and technical principles and reasonably conservative assumptions designed to ensure that aquatic life beneficial uses will be protected. Its use as a tool to determine what sediments within a specific area at the Shipyard Sediment Site are protected or degraded for benthic communities and to draw conclusions concerning impairment of the aquatic life beneficial use at the Shipyard Sediment Site is reasonable, appropriate, and scientifically defensible. Based on these considerations the DTR WOE framework can be applied to support a cleanup action at the Shipyard Sediment Site under Water Code Section 13304 and is consistent with the requirements of Resolution 92-49 pertaining to the investigation and determination of cleanup goals.

### **Sediment Chemistry LOE is Appropriately Weighted**

NASSCO and BAE Systems argue that MLOE analysis supporting the TCAO is inconsistent with other published decision weight of evidence (WOE) frameworks, and places undue emphasis on the sediment chemistry line of evidence in violation of sound scientific and technical principles. The DTR WOE framework is based on a WOE approach developed for another San Diego Bay Site by well qualified scientists knowledgeable in the sediment quality assessment field. The DTR WOE framework is fully documented in SAR286743 and is consistent with other published WOE frameworks. The Cleanup Team maintains that adaptation of this framework for use in assessing sediment quality at the Shipyard Sediment Site (See DTR Section 18.5) is reasonable, appropriate, and scientifically defensible.

The Triad provides a weight-of-evidence approach to sediment quality assessment by integrating synoptic measures of sediment chemistry, toxicity, and benthic community composition. The DTR sediment quality assessment framework is the same as, and was based on, the sediment quality assessment framework developed in 2004 - 2005 and used in the TMDL development work for the mouths of Chollas Creek and Paleta Creek in San Diego Bay. The derivation and basis for the Chollas Creek and Paleta Creek sediment quality assessment framework is fully documented in the May 2005 report, *Sediment Assessment Study For The Mouths Of Chollas And Paleta Creek San Diego, Phase I Final Report*, prepared by SCCWRP and Space and Naval Warfare Systems Center San Diego US Navy (See SAR286580, SAR286581, SAR286582, SAR286743, and SAR286959) (hereafter referred to as the Phase I Final Report for the mouths of Chollas Creek and Paleta Creek). Mr. Steve Bay, an environmental scientist with SCCWRP was a lead architect of the Chollas and Paleta Creek sediment quality assessment framework and was also the Principal Scientist on the State Water Board team that developed the sediment quality assessment framework adopted by the Bays and Estuaries Plan.

The Phase I Final Report for the mouths of Chollas Creek and Paleta Creek (SAR286743) provides the rationale in Section 4.2.4. at Pages 16 and 17 that the Cleanup Team relied on for the station classifications used in the DTR WOE framework. The following text is quoted directly from the Phase I Final Report, Section 4.2.4 to illustrate the key elements of the framework relied on by the Cleanup Team in the development of DTR WOE approach:

#### **“4.2.2.4 Triad Analysis of Impairment to Aquatic Life Beneficial Use**

The three LOE described above were integrated into an overall WOE assessment focused on identifying the likelihood that site-specific aquatic life beneficial use is impaired at given station due to the presence of known CoPC related to the site. The approach follows the general principles of WOE analysis described by Chapman 1990 1996 and others. Potential combinations of the ordinal rankings for individual LOE were assessed and assigned relative overall likelihood of impairment using three categories Unlikely Possible and Likely based on consideration of four key elements as described by Menzie et al, 1996

- the level of confidence or weight given to the individual LOE
- whether the LOE indicates there is an effect
- the magnitude or consistency of the effect
- the concurrence among the various LOE

The three categories of impairment are defined below:

**Unlikely** - A station was classified as “Unlikely” if the individual LOE provided no evidence of biological effects due to elevated COPCs relative to the baseline condition at the site. This category was assigned to all stations with a “Low” chemistry LOE ranking, regardless of the presence of biological effects because there was no evidence that effects were related to site specific contamination. Similarly, stations having a “Moderate” ranking for chemistry and a “Low” ranking for biological effects were also classified as “Unlikely”. The category of “Unlikely” does not mean that there was no impairment but that the impairment was not clearly linked to site related contamination.

**Possible** – A station was classified as “Possible” when there was lack of concurrence among the LOE, which indicated less confidence in the interpretation of the results. This category was assigned to stations with moderate chemistry and lack of concurrence among the biological effects LOE (i.e. effects present in only one of two LOE). Intermediate chemistry rankings have less certainty for predicting biological effects and the lack of concurrence between the toxicity and benthic community measures indicates lower degree of confidence that the biological effects observed were due to COPCs at the site; these effects could have been caused by other factors (e.g. physical disturbance or natural variations in sediment characteristics.) The category of “Possible” represents situations where impairment was indicated but there was less confidence in the reliability of the results. Of the three categories listed stations in this group would be more likely to change their category as a result of natural variability, changes in the composition of the reference stations used for comparison, or to differences in the criteria used to classify each LOE.

**Likely** – A station was classified as “Likely” if there was high level of agreement between observed biological effects and elevated COPCs at the site. Concurrence among the three LOE (i.e. the presence of moderate or high rankings for chemistry toxicity and benthic community) always resulted in classification of likely impairment. This classification was also assigned when the chemistry LOE was “High” and biological effects were present in either the toxicity or benthic community LOE.

For example a station with a high ordinal ranking for chemistry, toxicity and benthic community would indicate a high likelihood of site-specific aquatic life impairment because each LOE indicates an effect, the magnitude of the effect is consistently high, and there is clear concurrence among the LOE. Alternatively a station with low ordinal ranking for chemistry and moderate or high rankings for toxicity and benthic community would indicate unlikely site specific aquatic life impairment from site CoPCs because there is no concurrence with site CoPCs. This does not mean that there is no impairment but that the impairment is not clearly linked to site related contamination. The framework shown in Table 4-1 was used to interpret the results and is consistent with other published WOE frameworks.”

The existing DTR Text at 18.5, Page 18-26 will be revised to provide further supporting documentation of the weight of evidence approach presented in Table 18-14. The revision will be provided on September 15, 2011 consistent with the Third Amended Order of Proceedings.

Under the DTR approach, the three LOE, chemical concentration, sediment toxicity, and benthic infaunal community, are integrated into an overall Weight of Evidence (WOE) assessment focused on identifying the likelihood that the aquatic life beneficial use is impaired at a given station due to the presence of a known contaminant related to the Shipyard Sediment Site. The framework approach follows the general principles of WOE analysis described by Chapman and others (See SAR286743, Page 16).

The Cleanup Team’s WOE approach described in DTR Table 18-14 does not require adjustment to give the benthic community LOE more weight than the sediment chemistry and sediment

toxicity LOEs as suggested by some commentors. At the time the DTR WOE approach was developed in 2003 there was no single, universally accepted method in California for interpreting sediment triad data and classifying sediments based on an MLOE approach. The State Water Board did adopt a comprehensive sediment quality assessment WOE approach for statewide implementation in the Bays and Estuaries Plan; however, the Shipyard Sediment Site is exempt from that requirement under Provision II.B-2 of the Bays and Estuaries Plan because the Shipyard Report (Exponent 2003) was completed and submitted to the San Diego Water Board on October 15, 2003. (See DTR 15 at Page 15-3.)

The DTR WOE approach and the State Water Board's Bays and Estuaries Plan WOE approach are similar in that they both use a scientifically defensible logic system to integrate MLOE data based on a transparent set of criteria used to infer the likelihood of causality for contaminant-related impacts. NASSCO expressed a preference for the State Water Board's Bays and Estuaries Plan WOE approach because it incorporates a direct integration of benthos and toxicity LOE to assess the severity of biological effects at a station and that benthos is given greater weight in this assessment. Although the DTR and the Bays and Estuaries Plan WOE approaches incorporate different schemes for weighing the benthic community LOE, both approaches generally yield similar assessments when compared side by side. For example under the triad data scenario indicating "high" chemistry, "reference" benthic communities, and "nontoxic" or "low" sediment toxicity, the station would be designated as "Likely Unimpacted" under the Bays and Estuaries Plan WOE approach and "Possibly" impacted, under the DTR WOE approach. Note that both the definition for "Likely Unimpacted" (under the Bays and Estuaries Plan WOE approach) and "Possible" (under the DTR WOE approach) include assessment results where there is a disagreement or lack of concurrence among the LOE, which indicate less confidence in the interpretation of the results that in turn reduces certainty in classifying the station.

NASSCO and BAE Systems argue that the Cleanup Team relied solely on chemical concentration data in its WOE assessments and did not account for factors that affect bioavailability of contaminants in sediment. NASSCO and BAE Systems also argue that the Cleanup Team failed to further investigate stations that were designated as "possible" or "likely" impaired due to "high" chemistry results (such as NA 17, NA19 and NA22), stations designated as possible or to sufficiently evaluate alternative causal explanations.

The Cleanup Team did do the follow-up analysis on the WOE results for NA17, NA19 and NA22 and other stations suggested by NASSCO and BAE Systems before deciding if they should be included in the remedial footprint. For example, NA17 ranked as "Likely" under the DTR WOE framework (See DTR Table 18-1 at Page 18-1.) and had high COC concentrations relative to reference and benchmarks, no significant toxicity relative to reference and controls, and benthic community conditions consistent with reference areas. Because multiple biological tests showed no significant impact relative to reference, the follow-up interpretation for NA17 was that COCs are not sufficiently bioavailable to benthic organisms to cause impairment significantly different from reference areas of the bay. (See DTR Section 32 at Page 29.). NA17 was ultimately included in the remedial footprint in order to achieve the post-remedial SWACs for human health and aquatic dependent wildlife protection (See DTR Section 32.2). NA19 was ranked as "Likely" under the DTR WOE framework with high COC concentrations relative to reference and benchmarks, moderate toxicity relative to reference and controls, and benthic

community conditions consistent with reference areas. (See DTR Table 18-1 at Page 18-1). The station was interpreted to have the potential to impact aquatic life beneficial uses and ultimately was targeted for remedial action to address aquatic life concerns as well as to achieve site wide post remedial post-remedial SWACs protective of aquatic dependent wildlife and human health beneficial uses. (See DTR Section 32 and DTR Section 33). NA22 was ranked as "Likely" under the DTR WOE framework with moderate COC concentrations relative to reference and benchmarks, moderate toxicity relative to reference and controls, and moderate impacts to benthic community conditions relative to reference areas. Further follow-up analysis noted that NA22 was in an area where propeller testing occurs routinely, suggesting that physical impacts could be causing the impaired benthic condition and were not contaminant induced. The Cleanup Team also noted additional samples from the mouth of Chollas Creek TMDL will allow a better assessment of the causes of potential impairment in the mouth of Chollas Creek area, which would allow a more effective remediation decision to be made regarding NA22. Therefore, the polygon represented by the station NA22 was excluded from the remediation footprint. (See DTR Section 33.1.1).

**The Reference Pool Stations are Appropriate for Site Comparisons**

NASSCO argues that the reference pool does not accurately represent the chemical and biological conditions at the shipyards in the absence of site-related discharges because the reference stations contain coarser sediments, more organic carbon, and are located far from shore. The Cleanup Team agrees that there are some key differences in the physical characteristics between the Shipyard Sediment Site stations and the reference pool stations (referred to also as reference pool) as shown in the Table below:

Sediment Physical Characteristic	Reference Pool Stations	NASSCO Triad Stations
Percent Fines (mean)	45%	79%
Percent Total Organic Carbon (mean)	1.9%	0.9%

The criteria for selecting the DTR reference pool described in DTR Section 17 included low levels of anthropogenic pollutant concentrations, locations remote from pollution sources, similar biological habitat to the Shipyard Sediment Site, sediment total organic carbon (TOC) and grain size profiles similar to the Shipyard Sediment Site, adequate sample size for statistical analysis, and sediment quality data comparability. The DTR reference pool was also selected to represent contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination. Selection of the reference pool required some degree of compromise to meet the somewhat ambiguous requirement of a reference site “substantially free” of contaminants, yet having physical and chemical characteristics and biological parameters “broadly similar” to the contaminated marine sediment, and reflective of conditions “that existed before the discharge.” (See DTR Section 17.1, Page 17-3).

Metals contaminants have a greater affinity to fine grain sediments than to coarse grain sediments and consequently can remain tightly bound to fine grain sediments. In recognition of the grain size difference between the Shipyard Site Sediment stations and the reference pool stations, an approach was developed in the DTR to address the issue. In the DTR, a key step to evaluating the sediment chemistry LOE is to determine if there are statistically significant differences between chemical concentrations in the impacted Site sediment and chemical concentrations in reference station sediment (See DTR Section 18.2). The DTR statistical procedure consists of identifying chemical concentrations in Site stations outside the boundaries established by the 95% upper predictive limit (UPL) of the reference pool chemical concentrations. To address grain size effects on metals and to help identify concentrations of metals that were enriched at the Site, a range of 95% UPL values for metals were calculated based on fines content (See DTR Table 18-3). This allows a direct comparison of Site stations with specific percent fines.

### **Multiple Lines of Evidence Should Drive the Triad Data Analysis**

NASSCO argues that the DTR is overly conservative because it concludes that there are impacts on aquatic life, even though the preponderance of sediment toxicity results show that Site sediments are nontoxic. NASSCO also argues that the direct assessment of benthic macroinvertebrate communities at NASSCO directly refutes the conclusion in the DTR that some areas at NASSCO have “likely” or “possible” effects on the benthic macroinvertebrates as a result of shipyard discharges. The Cleanup Team disagrees with all of these assertions.

The DTR did not assess the risk to aquatic life (i.e., benthic community) solely on the basis of toxicity tests or benthic community measures. Rather, the DTR used multiple lines of evidence organized into a sediment quality triad (Triad) to evaluate potential risks to the benthic community from pollutants present at the Shipyard Sediment Site (See DTR Section 16 through 18). The Triad provides the basis for a “weight-of-evidence” approach to sediment quality assessment by integrating synoptic measures of sediment chemistry, toxicity, and benthic community composition. All three measurements played a role in the framework of complementary evidence for assessing the degree of pollutant-induced degradation in the benthic community.

### **The Bivalve Larval Development Toxicity Test is Appropriately Weighted**

NASSCO argues that the results of the bivalve development test are given an inappropriate amount of weight in the DTR's triad analysis and that bivalve development test results should be discounted because of the experimental nature and variable results of the tests. The bivalve development test results are, in fact, reliable and weighted appropriately in the DTR triad analysis based on several considerations.

First, the laboratory that conducted the bivalve development tests concluded that “[t]he tests were validated and are acceptable for interpretation with the caveat that the Batch 2 organisms may have been more responsive to fine-grained sediments than expected” (MEC Analytical Systems, 2001). The Cleanup Team further evaluated the relationship between percent fines and percent bivalve development and determined that there was no clear evidence that fine-grained sediments were directly affecting the Batch 2 results as shown in Figure 18-1 below).



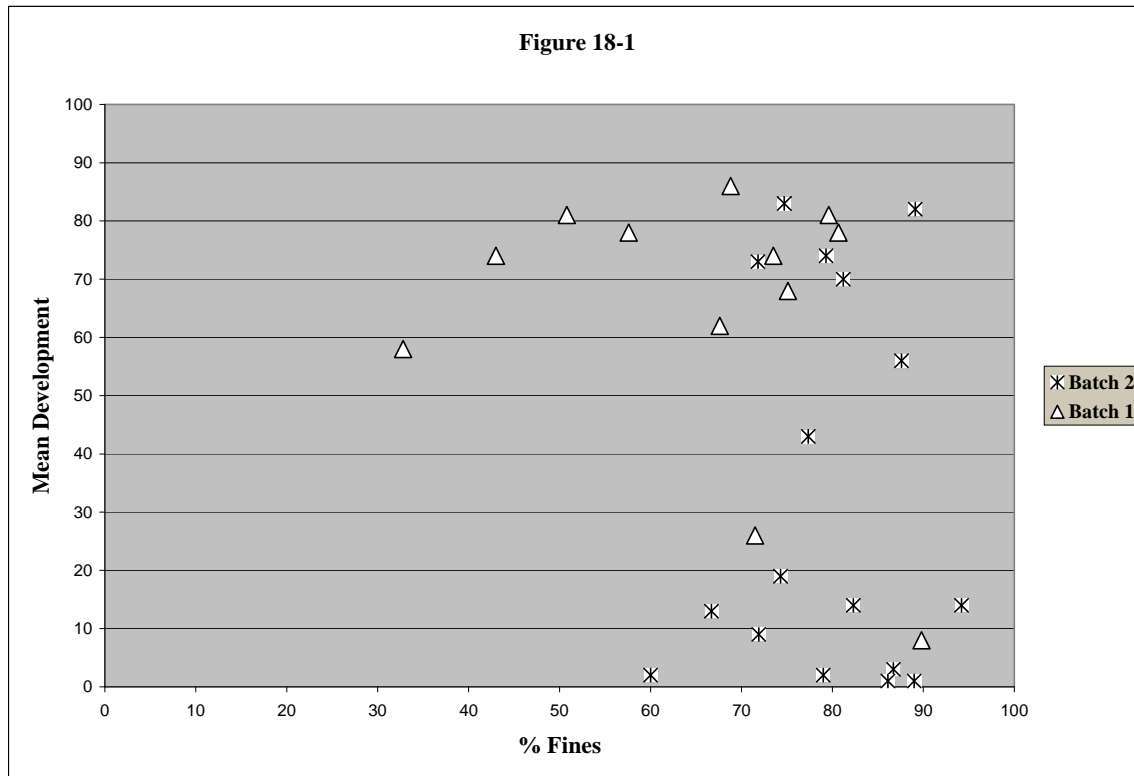


Figure 18-1 shows that while low percent bivalve development was observed with high fines content for certain Site stations, the opposite was also true. There was about an equal amount of Site stations that had high development with high fines content.

Second, while it is correct that “Bay et. al. (2007a) note that the bivalve larvae sediment-water interface test has only fair reproducibility among laboratories and has a low relative precision of the response as referenced in the comment,” (SCCWRP, 2007), these two criteria do not provide the full picture of the overall analysis and most importantly, the results and recommendations. The objectives of the SCCWRP 2007 Report was to (1) evaluate a variety of acute and sublethal toxicity tests based on feasibility, performance, and cost and identify those tests that were best suited for use in a California statewide regulatory program, and (2) develop a system to classify the toxicity test results into a series of categories of effect. Of the seven sublethal tests evaluated, the bivalve larvae sediment-water interface test was one of four that was rated “Yes” for the “Overall Feasibility” criteria and had a total score of 29 for the “Performance and Cost” criteria. Only two other sublethal tests had higher total scores. (See Table 4 of Bay et. al. 2007a). Finally, based on the comparative analysis of the acute and sublethal tests using the feasibility, performance, and cost criteria, the SCCWRP 2007 Report recommended five tests as best suited for use in a California statewide sediment quality assessment program. The bivalve larvae sediment-water interface test was one of two recommended sublethal tests. The State Water Board adopted these five recommended acute and sublethal toxicity tests for use in the toxicity LOE assessment in the Bays and Estuaries Plan.

While several Shipyard Sediment Site station samples exhibited high variability among the replicates, this variability is to be expected because of how the replicates are collected in the field for the bivalve development test. Typically, replicates for toxicity tests are based on a homogenized sample where, for example, sediment from a specific Site station is collected using a clamshell bucket, the top few centimeters of sediment are scraped off, and then placed into a bowl where the sediment is mixed and distributed accordingly for the replicates. High variability among the replicates using this procedure is considered unusual because of the homogenization process. The replicates for the bivalve development test, however, were collected differently (See SAR106283, Appendix H). For each Site station, five replicates were produced by driving five individual core tubes into the sediment to approximately 4-6 inches. These replicates often represent discrete sediment core samples as opposed to replicates of a homogenized sample, which may explain the reason for increased variability among the replicates (SCCWRP 2007).

### **Sediment Profile Images Were Appropriately Considered**

NASSCO argues that the sediment profile images (SPI) collected throughout the Site “confirm” the presence of mature benthic communities at the Site, and refute Staff’s conclusions that benthic macroinvertebrates at the Site are impaired. The Cleanup Team considered the SPI photographs collected at the Shipyard Sediment Site as an additional line of evidence for evaluating benthic community health. The traditional benthic community measures (e.g., the Bight’98 Benthic Response Index for Embayments, total abundance, total taxa richness, and Shannon-Weiner Diversity Index) used in the DTR were given greater weight than the SPI because the traditional measures are more well-established and consistently used in sediment quality investigations throughout the United States. For example, the State Water Board’s Bays and Estuaries Plan requires grab samples to assess the benthic community condition and not SPI images. Moreover, the traditional measures provide quantitative measures of the benthic community health while the SPI is qualitative. There is a lack of published studies that confirm the reliability of SPI in accurately predicting sediment quality as defined by the traditional measures. The Cleanup Team understands that such a study, the first of its kind in California, is currently underway in Los Angeles Harbor, Long Beach Harbor, and San Diego Bay and is being conducted by the Southern California Coastal Water Research Project. This effort is currently in the third year of a four-year study.

### **Number of Taxa at NA20 Was Correctly Identified as Statistically Different**

NASSCO argues that the number of taxa at NA20 was incorrectly identified as statistically different, despite falling within the reference range. While the Cleanup Team agrees that the number of taxa at NA20 is equal to the number of taxa for the reference pool, NA20 is “bold faced and shaded” in DTR Table 18-12 because the number was “less than or equal to” the reference pool 95 percent prediction limit. The “less than or equal to” criteria is used in the DTR flow chart to categorize the stations for the benthic community line-of-evidence (DTR Figure 18-3). This flow chart, as well as the sediment chemistry and toxicity flow charts, were originally developed for the sediment quality site assessment work for the mouth of Chollas Creek and Paleta Creek TMDLs (SAR286743 and SAR286582).

**Assemblage of Organisms in NASSCO Sediments is Not Significantly Different from Reference**

NASSCO commented that the benthic community analyses indicate that the assemblage of organisms in Site sediments is not significantly difference from reference. The Cleanup Team agrees with the comment. Table 18-12 of the DTR compares the benthic community metrics data for each shipyard station to the reference pool. None of the stations exceeded the reference pool's 95 percent predictive limit values.

**Adjusting for Multiple Statistical Comparisons is Conservative and Protects Aquatic Life**

NASSCO commented that Staff's failure to adjust for multiple comparisons is excessively conservative because it increases the probability of false-positives. As stated in the DTR Section 18.2, the Cleanup Team made a decision to not correct for multiple comparisons so that the Shipyard Site/Reference comparisons would remain conservative and ensure the protection of aquatic life beneficial uses.

**Several Different Approaches were Used in the DTR to Assess Site-Specific Bioavailability**

NASSCO commented that the WOE approach used in the DTR erroneously equates chemical exposure with chemical toxicity, and ignores the fact that the site-specific bioavailability of the chemicals may be limited. In such cases, exposure to elevated chemical concentrations would not necessarily result in sediment toxicity or adverse effects on benthic macroinvertebrate communities.

The State Water Board defines bioavailability as: "The fraction of a chemical pollutant or contaminant that can be absorbed by an organism through gills or other membranes, potentially causing an adverse physiological or toxicological response. Bioavailability is dependent on the chemical form of the pollutant in the media, the physical and biogeochemical processes within the media, the route and duration of exposure, and the organism's age, metabolism, size and sensitivity." (SWRCB 2008, Page 8-1) The principal objective of bringing bioavailability considerations into contaminated sediment management is to reduce the extent of cleanup required while still being protective of aquatic life, aquatic dependent wildlife and human health beneficial uses. In addition, incorporating bioavailability information in the calculation of risk can be an important factor in balancing the risks caused by remedial action with those addressed by the remedial action.

The WOE does not explicitly incorporate site-specific bioavailability considerations, such as total organic carbon (TOC), pH, acid volatile sulfides (AVS), and simultaneously extracted metals (SEM) which can provide better insight on benthic effects than measured bulk sediment chemical concentrations. However, the DTR uses several different approaches to assess bioavailability in the benthic pathway including:

***Contaminant Concentrations*** -- Chemical concentrations in bulk sediment were compared to commonly used sediment quality guidelines (SQGs) which have predictive ability with respect to biological effects. (See DTR Section 18.2). Pore water chemistry levels were measured and compared to California Toxics Rule (CTR) water quality criteria (See DTR Appendix for Section 15).

**Biological Effects** -- Three types of toxicity tests were compared to negative controls and to reference (DTR Section 18.3) and four benthic metrics were compared to the thresholds and to reference (DTR Section 18.4). Toxicity tests provide a measure of the bioavailability and toxicity of sediment contaminants from direct exposure and are not affected by many of the environmental factors that confound benthic community analyses or other measurements of effect in the field.

**Bioaccumulation** -- Chemical concentrations were measured in clam tissue (See DTR Section 19). The clam tissue test is the most convincing and direct test that indicates sediment pollutants at the Site are bioavailable. This test involves the exposure of the clam *Macoma nasuta* to Site sediments for 28 days using the protocols specified by ASTM. *Macoma* was selected as the test species to represent benthic organisms at the Site because it is native to the West Coast and actively ingests surface sediment (likely to be the most direct route of exposure to contaminants that accumulate in tissues). The results indicate that for several pollutants, concentrations in the *Macoma* tissue increase as pollutant concentrations in sediment increases. Statistically significant tissue:sediment relationships were found for arsenic, copper, lead, mercury, zinc, TBT, PCBs, and HPAHs and thus, these pollutants have a bioaccumulation potential at the Site and are considered bioavailable to benthic organisms.

**Follow-up Analysis on NA17, NA19, and NA22** -- The Cleanup Team did do follow-up analysis on the WOE results for NA17, NA19 and NA22 suggested by NASSCO and BAE Systems and considered the site-specific bioavailability of the chemicals before deciding if they should be included in the remedial footprint. (See DTR Sections 32 and 33).

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## RESPONSE 18.2

**DTR Section:** 18

**Comments Submitted By:** BAE Systems, Coastkeeper and EHC

**Comment IDs:** 178

**Comment**

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Coastkeeper and EHC and their retained expert, Donald MacDonald argue that “Virtually all of the SQT stations evaluated had concentrations of contaminants that indicated the benthic invertebrates receive moderate to high exposure to contaminants at the Shipyard Sediment Site” is Invalid (DTR §§ 32.5, 32.5.1, and 32.5.2; DTR Tables 32-17 through 32-22; DTR § 33.1.3; Table 33-2).

In rebuttal, BAE Systems argue that this conclusion is invalid because exposure of benthic macroinvertebrates to certain contaminant concentrations at a site does not necessarily imply that ecological effects will result, as MacDonald implies. A major reason for this lack of direct relationship between exposure and effects is that the bioavailability of contaminants at a site often is less than 100 percent. Moreover, the fact that the SQT relies on two kinds of biological indicators, in addition to sediment chemistry, is related largely to uncertainties regarding contaminant bioavailability. A major use of the two kinds of biological indicators (i.e., sediment toxicity tests and evaluations of in situ benthic macroinvertebrate communities) is to determine whether the measured chemical concentrations in bulk sediment are sufficiently bioavailable to result in adverse ecological effects. Therefore, because the use of sediment contaminant

concentrations as standalone indicators of sediment toxicity is invalid for definitive assessments of sediment quality, MacDonald's assertion is incorrect.

### **Response 18.2**

The Cleanup Team concurs with BAE Systems rebuttal comments that the use of sediment contaminant concentrations as stand-alone indicators of sediment toxicity is invalid for definitive assessments of sediment quality. The DTR used the sediment quality triad (Triad) to evaluate the potential risks to the benthic community from pollutants present at the Shipyard Sediment Site. The Triad framework is recommended by U.S. EPA (SAR283146 and SAR283124) and is considered to be a standard method for qualitatively assessing the relationship between sediment chemical concentrations and biological effects. The Triad provides a weight-of-evidence approach to sediment quality assessment by integrating synoptic measures of sediment chemistry, toxicity, and benthic community composition. Additionally, the DTR uses site-specific chemical thresholds for evaluating non-Triad stations (i.e., chemistry-only stations). These thresholds consisted of site-specific Lowest Apparent Effects Thresholds (LAETs) for individual COCs and a site-specific Median Effects Quotient (SS-MEQ) to address combined effects of multiple COCs. See Responses 18.4, 33.1 and 34.2 for details on these thresholds.

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### **RESPONSE 18.3**

**DTR Section:** 18, 32.5.2

**Comments Submitted By:** NASSCO

**Comment IDs:** 168

#### **Comment**

NASSCO'S COMMENT The TCAO and DTR should be corrected to identify the correct number of likely stations (Findings 18, 32). Table 18-1 in Volume II of the DTR, and the sections that follow, correctly summarize the outcome of the DTR Triad analysis. According to this analysis, there are six "likely" stations, two of which are at NASSCO (NA19 and NA22), and four of which are at BAE (SW04, SW13, SW22, and SW23). NA22 is footnoted in Table 18-1 as being excluded from the TCAO.

### **Response 18.3**

There are 6 "likely" stations and not 3 "likely" and 3 "possible." The referenced DTR section 35.5.2 will be revised to reflect this change. The revision will be provided on September 15, 2011 consistent with the Third Amended Order of Proceedings.

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### **RESPONSE 18.4**

**DTR Section:** 18

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 83, 160, 169, 280, 281, 383, 384, 385, 386, 387, 389, 472, 473

#### **Comment**

This comment is based on SDGE Comment Letter dated May 26, 2011 Section 1.0 (1.1 to 1.5) and NASSCO and BAE Rebuttal Comments.

See Sections 14, 15, 18, and 19 for more analysis of aquatic life beneficial uses impairment analysis.

SDG&E commented that the aquatic life beneficial use impairment (BUI) analysis in the CAO and DTR is critically flawed and should be replaced with a causal approach. The DTR evaluated aquatic life impairment by two approaches: the Triad Approach and the non-Triad approach. The sediment chemistry lines of evidence used do not represent a complete characterization of chemical risk because they do not include all COCs and they are not based on cause-and-effect toxicity endpoints. As a result, the current Triad and non-Triad Data approaches set forth in the DTR are not scientifically valid or supportable, and should not be used to identify aquatic life beneficial use impairment (BUI). The Triad approach did not provide evidence regarding the specific chemicals responsible for the BUI. Such an analysis would be problematic because TBT, a primary Site chemical of concern, was not included in the chemical screening step in this analysis.

The non-Triad Data Approach used by CRWQCB (2010) to address benthic risk potential using sediment chemistry results is likewise critically flawed and cannot be used to quantify or understand the relative causal contribution of the five COCs to adverse toxic effects on macroinvertebrate communities (Conder, 2011a). More specifically, SDG&E commented that a primary flaw in the use of the SQGQ1 metric in the Triad WOE approach is that tributyltin (TBT) is not considered by the SQGQ1 metric, despite the fact that TBT was selected as a primary constituent of concern (COC). In addition, SDG&E commented that a second critical flaw in the Triad approach concerns the nature of the sediment quality guidelines (SQGs) used in the SQGQ1 because with that approach alone it is impossible to know which chemical, group of chemicals, or physical condition may be responsible for the presence of adverse effects. This leads to an absence of causality between concentrations of individual chemicals and adverse effects. Therefore the SQGs are not useful in predicting toxicity from individual chemicals.

SDG&E commented that the non-Triad approach in the DTR is flawed because the use of the 60% LAET value is arbitrary and not supported by any technical or regulatory guidance. Additionally, the LAET does not establish causality between chemicals and adverse effects because it is developed using an arbitrary mixture of chemicals. This deficiency also applies to the SS-MEQ portion of the non-Triad approach. The toxic unit approach outlined in Conder (2011a) is a causal approach that is superior to an empirical evaluation in assessing benthic risk and should replace the sediment chemistry line of evidence used in the DTR's Triad approach, and should be used for understanding aquatic life risk potential where Triad data are unavailable, replacing the current Non-Triad Data Approach.

The toxic unit approach was used to revise the remedial footprint to address potential aquatic life BUI. Stations identified by the revised toxic unit-based Triad and non-Triad data approaches were assumed to represent polygons exhibiting aquatic life BUIs and should be considered for inclusion into the remedial footprint to address potential aquatic life BUI (Figure 1). This footprint should be fully evaluated on the basis of overall technical and economic feasibility in a manner consistent with the approaches discussed in CRWQCB (2010).

NASSCO rebuts the SDG&E's comments that the aquatic life beneficial use impairment analysis in the CAO and DTR is flawed and should be replaced with a newly proposed toxic unit approach. The proposed toxic unit approach would do nothing to improve understanding of causality in the assessment of benthic impacts at the Shipyard Site, and would in fact be misleading and inferior to the DTR approach in this regard. The alternative approach advocated would, at most, be appropriate only as a screening tool for potential BUI if site-specific biological information was unavailable. Any characterization of aquatic life BUI based on the proposed alternative approach would be seriously flawed, and unnecessary, since extensive site-specific biological information exists for the Site.

The rebuttal comments point out that the AET component used in the non-Triad approach does provide causal information; contrary to SDG&E's comment. Furthermore, the SS-MEQ is an integrated index of multiple chemical exposure that quantitatively relates exposure at any non-Triad station to the exposure level at which evidence of impairment was observed in the Triad stations. While chemical causality can only be inferred from the SS-MEQ analysis rather than measured directly, the same is true of the toxic unit method's reliance on literature effect thresholds, and the SS-MEQ has the advantage of being based on site-specific data, for multiple lines of evidence. The proposed alternative approach would substitute a generic, theoretical causal assessment approach for an empirical, site-specific causal assessment approach, resulting in an inferior aquatic life BUI assessment. All of the aforementioned evidence for causality was available as part of the shipyard sediment studies using a Triad approach. Notwithstanding this evidence, SDG&E embarked on an independent assessment of causation using a novel theoretical approach that ignores all of the other available data. This represents a scientifically flawed assessment that is inconsistent with the current standards of practice in environmental investigations and frameworks established by the U.S. EPA and published in the available scientific literature.

SDG&E's proposed toxic unit approach has several erroneous assumptions including:

- Exposure-response relationships exist for primary COCs in sediments and sediment toxicity at the Shipyard Site.
- Sediments are at equilibrium with pore water at the Shipyard Site.
- Equilibrium partitioning accurately predicts pore water concentrations at the Shipyard Site.
- Exposure to pore water is continuous and is the most important pathway of exposure for benthic organisms.
- Selected literature benchmarks of aquatic toxicity accurately predict benthic toxicity of shipyard sediments when compared to estimated or measured pore water concentrations.

NASSCO also rebuts SDG&E's use of the toxic unit approach to derive an alternative remedial foot print. A standard tenet of environmental Site assessment is that site-specific empirical data are more reliable and preferred for remedial decision-making purposes than use of generic

benchmarks, and should be preferentially used for site characterization. Attachment A, Exponent Critique, at 14 (citing U.S. EPA 1989, U.S. EPA1997). The toxic unit approach is not site-specific, and is therefore far less scientifically valid than the DTR approach, which relies on both direct causal analysis and inferences drawn from empirical site-specific observation to establish the presence or absence of biological impacts and causality with regard to aquatic life BUI. The toxic units approach relies completely on theoretical exposure estimates and generic benchmarks, and is little more than a screening approach.

NASSCO rebuttal comment (Comment ID 387) provides a station by station review of the site-specific data available for the seven additional polygons SDG&E's analysis proposes to add to the remedial footprint.

NASSCO also rebuts SDG&E's revised economic feasibility analysis based on their proposed alternative remedial footprint since it is based on the flawed toxic unit approach. Any economic feasibility analysis based on this assessment approach will be similarly flawed. Furthermore, the use of reduction in site-wide SWAC as the metric of benefit for benthic invertebrate species is inappropriate. Unlike mobile human and wildlife receptors, which spatially average exposure over relatively large areas, benthic invertebrate communities are largely sessile, and must be assessed on a station-by-station basis. Site-wide average sediment conditions are not meaningful in measuring aquatic life BUI or BUI mitigation, and the alternative economic feasibility analysis presented is therefore invalid. NASSCO responds to MacDonald's comment that "There is insufficient evidence to demonstrate that the 60% LAET values provide a reliable basis for identifying polygons that are 'Likely' impacted." MacDonald states that "the 60% LAET values presented in Table 32-19 are substantially higher than the sediment quality guidelines that were used in the Triad assessment presented in the DTR and those that have been routinely used to evaluate sediment quality conditions at marine and estuarine sites throughout the United States." He then presents a table that compares the 60% LAET values with the ERM values of Long et al. (1995). (It should be noted that McDonald is a co-author of the Long article and as such the reference point is suspect.) The statement and comparisons made by MacDonald are flawed, because the 60% LAET values were derived as site-specific sediment quality values that reflect the mixtures of chemicals at the Site, in addition to other important factors such as the site-specific bioavailability of those chemicals. By contrast, the ERM values were derived from sediment chemistry and toxicity data collected throughout the U.S., without any consideration of bioavailability. They are therefore more suitable as initial screening values for a site, rather than values that can reliably predict the presence or absence of sediment toxicity on a site-specific basis. In fact, Long et al. (1995) recognized the limited usefulness of the ERM values when they concluded that the values "should be used as informal screening tools in environmental assessments", and "they are not intended to preclude the use of toxicity tests or other measures of biological effects." Because the ERM values are generic screening values that do not consider bioavailability, it is not surprising that the 60% LAET values are greater than the ERM values, as the former values reflect the site-specific conditions that occur at the Site. Therefore, MacDonald's statement described above has no bearing on the usefulness of the site-specific 60% LAET values for identifying polygons that are likely impaired at the site.

NASSCO also comments in response to MacDonald that the use of lowest apparent effects threshold (LAETs) and site-specific median effects quotient (SS-MEQ) benchmarks ensured that



the remediation footprint was overly protective (Finding 32) The site-wide Triad study measured synoptic chemistry, toxicity, and surveyed the benthic community at 30 of the 66 Shipyard sediment investigation stations. Potential impacts of sediment chemicals to the benthic community at the 36 Non-Triad stations, for which no biological data were collected, was inferred through the use of site-specific chemistry benchmarks, developed from the Triad data.

Two independent benchmarks were developed: The Site-Specific Median Effects Quotient (SS-MEQ) and Lowest Adverse Effects Threshold (LAET). The SS-MEQ is a multiple chemical benchmark calculated from the median sediment concentration of the five primary COCs at the six stations that were scored as “likely impacted” in the DTR Triad analysis (NA19, NA22, SW04, SW13, SW22, and SW23). For each station, effects quotients (the ratio of measured concentration to median “likely impacted” concentration) were calculated for each of the primary COCs, and these were averaged to yield the multi-chemical SS-MEQ. See DTR at 32.5.2. Furthermore, for each primary COC, apparent effects thresholds (AETs) were developed for each of the seven biological endpoints evaluated in the DTR Triad analysis (three toxicity tests and four benthic community parameters or indices). The AET is simply the concentration above which adverse effects always occur. Accordingly, the lowest adverse effects threshold (LAET) is the lowest concentration of any of the seven AETs calculated for a given chemical. Both the SS-MEQ and LAET values were used as benchmarks to identify the possibility of adverse effects on benthos at the non-Triad stations. Both benchmarks were tested and determined to be conservative measures for benthic community conditions at non-Triad stations. To test the protectiveness of the SS-MEQ and LAET values, SS-MEQ and LAET values were calculated for the 30 Triad stations (for which actual benthic condition assessment had been performed) to determine how well the SS-MEQ and LAET values predicted “likely” impacts to benthic communities. When compared to the 30 Triad stations, the 60% LAET results were completely protective with respect to predicting “likely” benthic impairment, since an AET is, by definition, a no-effect level, while inaccurately identifying one “false positive” (at NA07, as discussed above), where the LAET analysis suggested possible benthic impairment but the Triad analysis demonstrated no such impairment. Notably, the DTR used a benchmark equal to 60% of the LAET, which is highly protective because it builds in a buffer below the established no-effect level. The SS-MEQ benchmark (which was set equal to 90% of the SS-MEQ) had only one false negative out of 30 Triad stations, with respect to predicting “likely” impairment of the benthic community (at Station NA22, which is being addressed outside the current remedial design), and eight false positives, which indicates that using 90% of the SS-MEQ is overly protective by including stations that were not in fact likely impaired stations. Accordingly, the proposed cleanup was judged to be protective of benthos because it includes all non-Triad stations that exceed either of the 60% LAET or 90% SS-MEQ benchmarks, and both metrics incorporate a significant safety factor. It is worth noting that the highest LAET and SS-MEQ multiples found outside the cleanup footprint at NASSCO occur at Station NA07 (HPAH = 63% LAET; SS-MEQ = 0.91).

Station NA07 is a Triad station for which no impacts to the benthic community were identified, however, and a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks. In fact, NA07 is one of the “false positives” identified above, because the benthic community assessment demonstrates “unlikely” benthic impacts. Therefore, no risk-based justification for remediating NA07 exists, and NA07 was properly excluded from

the proposed remedial footprint in the DTR. Mr. MacDonald notes that Table 33-6 is incorrect in that it states that for NA07, "All COCs [fall] below 60% LAET values." DTR, at Table 33-6. Mr. MacDonald is correct, and Table 33-6 should be edited to state, "Only one All COCs slightly abovebelow 60% LAET values (HPAH = 63% LAET)." Triad data demonstrates that there are no impacts to aquatic life at this station.

#### **Response 18.4**

SDG&E's argues that the DTR's analysis for benthic (aquatic life) beneficial use impairment is critically flawed and should be replaced with a causal approach to adequately identify risk. NASSCO argues in rebuttal that SDG&E's proposed alternative causal approach would do nothing to improve understanding of causality in the assessment of benthic impacts at the Shipyard Sediment Site, and would in fact be misleading and inferior to the DTR approach in this regard.

SDG&E comments presenting their recommended causal approach referred to as the "toxic unit approach" are based on the report by their retained expert, Jason Conder, entitled "Analysis of Causality Between Aquatic Life Beneficial Use Impairment and Site Primary CoCs at the San Diego Shipyard Sediment Site", March 11, 2011 (Conder 2011) submitted with SDG&E's comments. The Introduction section of the Conder Report states that "This report presents an analysis of the relative contributions of the five chemicals of concern...at the Shipyard Sediment Site (Site)." Similarly, the conclusion in the Conder Report states that "The [DTR] evaluation of chemicals in sediment with respect to characterizing Aquatic Life BUI [beneficial use impairment] is inappropriate for determining the specific contaminants responsible for Aquatic Life BUI at the Site." The Conder Report approach proposes an evaluation of the relative contributions of various chemicals in causing biological effects while the objective of the Triad and Non-Triad approaches in the DTR is to evaluate potential overall effects to the benthic community from pollutants, regardless of their relative contribution, and to provide a sound basis for development of alternative cleanup levels in the TCAO that are protective of aquatic life beneficial uses.

Contrary to the assertions of SDG&E and their expert Mr. Conder, the DTR's approach to assessing benthic beneficial use impairment at the Triad and Non-Triad stations is not critically flawed and should not be replaced with a causal approach to adequately identify risk. The DTR approach is reasonable, complete, and scientifically supportable. The various empirical, consensus based, and site derived SQGs used to support the assessment are technically and scientifically sound, appropriately applied, and well suited for overall assessment of potential biological effects. The casual approach advocated by SDG&E's expert uses partitioning models designed to determine cause of biological effects through the identification of specific pollutant stressors. While this type of approach may have applications in the assessment and management of contaminated sediment where determination of cause is needed, the DTR approach differs in that it is based on the probability of biological effects due to chemical contamination levels and is well suited for overall assessment of impacts. Stressor identification is not a required element of the DTR approach for either beneficial use impairment assessment or development of protective alternative cleanup levels consistent with the requirements of Resolution No. 92-49.

The Cleanup Team agrees with NASSCO's and BAEs' comments and rebuttals that support the DTR Triad WOE and Non-Triad SS-MEQ/60%LAET derived approaches for determining aquatic life beneficial use impairment and for designing a remedial dredge footprint that is protective of beneficial uses. See Section 33 for more details on the Triad and Non-Triad approaches, including specifics on the metrics SQGQ1, SS-MEQ, and 60%LAET. The Cleanup Team also agrees with those rebuttal comments that identify potential weaknesses in the toxic unit approach proposed by SDG&E.

The Cleanup Team response below is subdivided into 3 topics to address SDG&E's chief concerns with the DTR's approach for aquatic life beneficial use impairment assessment : SQGQ1 Metric, Tributyltin (TBT) Exclusion, and Non Triad Data Approach..

**The SQGQ1 Metric is Appropriately Used in the Sediment Chemistry LOE Analysis.**

The SQGQ1 value for a sediment is estimated by dividing concentrations of cadmium, copper, lead, silver, zinc, total chlordane, dieldrin, total polycyclic aromatic hydrocarbons (PAHs; normalized by sediment organic carbon content), and total PCBs (sum of 18 congeners) in sediment by each chemical's empirical SQG and subsequently averaging the individual quotients (See SAR280606). The SQGQ1 uses two SQG types that are based on the chemical constituent: empirical and consensus midpoint effect concentrations (MEC). Examples of empirical SQGs for the marine environment used in the SQGQ1 metric include the effects range-median (ERM) and probable effects level (PEL) for metals. The published empirical ERM and PEL SQGs employed in the SQGQ1 calculation are derived from the statistical analysis of large databases of matched sediment chemistry and biological effects data collected at sites across the United States. The consensus MEC SQGs used in the SQGQ1 metric for total PAHs and total PCBs were obtained from Schwartz 1999 (See SAR286325) and McDonald et al 2000 (See SAR280497) respectively. Consensus MEC values are the geometric mean of three or more SQGs that correspond to the same biological effect level. The mean consensus quotient is calculated for a sample by dividing each chemical concentration by its respective SQG and subsequently averaging the individual quotients.

Both the empirical SQGs and consensus MEC SQGs employed in the SQGQ1 metric provide an estimate of the probability of effects due to chemical contamination levels and are thus well suited for overall assessment of potential biological effects. The Cleanup Team selected the SQGQ1 approach as one of three metrics in the sediment chemistry LOE analysis in DTR Section 18.2. because it was a scientifically valid metric that could be used as a central tendency indicator of the potential for adverse biological effects from chemical mixtures in a complex sediment matrix. The use of the SQGQ1 metric fits well in the conceptual framework of the sediment quality triad analysis employed in the DTR WOE approach to sediment quality assessment. Mechanistic SQGs such as what is proposed in the Conder Report use partitioning models to determine cause and effect and are thus suited for applications where determination of cause is needed. A determination on the chemical specific cause of potential biological impacts is not needed to complete a scientifically valid sediment chemistry LOE analysis. Accordingly the Cleanup Team does not need to incorporate a mechanistic SQG approach in the DTR sediment chemistry LOE analysis such as that advocated in SDG&E's Conder Report.

Furthermore the empirical SQGs and consensus MEC SQGs used in the SQGQ1 calculation are widely used in sediment quality investigations throughout the United States. In California alone, empirical SQGs and consensus MEC SQGs have been used in the following programs and investigations (including but not limited to):

- (1) State Water Board's Bay Protection and Toxic Cleanup Program in San Francisco Bay, Los Angeles Harbor, Long Beach Harbor, Newport Bay, Anaheim Bay, Huntington Harbor, and San Diego Bay.
- (2) Southern California Bight 1994, 1998, and 2003 Regional Marine Monitoring Programs.
- (3) Campbell Shipyard Sediment Investigation in San Diego Bay.
- (4) Naval Station San Diego Sediment Investigation in San Diego Bay.
- (5) Naval Amphibious Base Sediment Investigation in San Diego Bay
- (6) Former Naval Training Center - Boat Channel Sediment Investigation in San Diego Bay.
- (7) TMDL Program for Toxic Pollutants in San Diego Marine Sediments - Mouth of Chollas Creek, Seventh Street Channel, Switzer Creek, B Street/Broadway Piers, Downtown Anchorage, and Naval Station Submarine Base.
- (8) TMDL Program for Toxic Pollutants in Newport Bay Sediments.
- (9) TMDL Program for Toxic Pollutants in Los Angeles Harbor and Long Beach Harbor Sediments.
- (10) Hunters Point Shipyard Sediment Investigation in San Francisco Bay.

Empirical SQGs derived from California sediment data are also used in the State Water Board's Bays and Estuaries Plan (see Section IV.H. Sediment Chemistry). The Bays and Estuaries Plan represents the first phase of the State Water Board's sediment quality objective effort and focuses primarily on the protection of benthic communities in California's enclosed bays and estuaries.

**Tributyltin was Appropriately Considered in the Sediment Chemistry LOE Analysis.**

There were a number of considerations involved in the Cleanup Team's decision to exclude TBT from the sediment chemistry LOE analysis described in DTR Section 18.2. despite the fact that it was ultimately selected as a Primary COC at the Site in DTR Section 29.3. The research paper, documenting the SQGQ1 metric (Fairely et. al., 2001 at SAR280606) used in the sediment chemistry LOE analysis, evaluated the type and number of analytes to be included in the SQGQ1 calculation to find chemical combinations that predict biological effects as indicated by marine amphipod mortality in sediment toxicity tests. The combination of chemicals used in the SQGQ1 calculation found to be the most predictive of acute toxicity to amphipods included cadmium, copper, lead, silver, zinc, total chlordane, dieldrin, total PAH-OC normalized, and total PCBs. Under the SQGQ1 approach these chemicals are assumed to be representative of, or

the surrogates of, the toxicologically significant chemical mixture regardless of which chemicals were quantified in the sediment chemistry analyses. This is a reasonable approach given the seemingly infinite number of chemicals present in marine sediment and it is not at all uncommon to exclude a specific chemical(s) in the chemistry LOE analysis for determining potential aquatic life beneficial use impairment. In fact, if the Bays and Estuaries Plan was implemented at the Shipyard Sediment Site, TBT would not be considered in the sediment chemistry LOE even though it might be present in the sediment sample being considered. Furthermore TBT is not on the Bays and Estuaries Plan required list of chemicals to analyze to assess exposure using the two sediment chemistry guidelines (Chemical Score Index and California Logistic Regression Model).

The Cleanup Team also had additional considerations in not explicitly including TBT in the sediment chemistry LOE analysis. The LOE analysis method described in DTR Figure 18-1 included a step for comparing sediment chemistry levels against published empirical SQGs and consensus MEC values as part of the process for determining the likelihood of aquatic life beneficial use impairment caused by sediment chemistry levels. The Cleanup Team is not aware of any published empirical SQGs or Consensus MEC values for TBT and hence this comparison could not be made for TBT. Another key step in the DTR Figure 18-1 sediment chemistry LOE analysis methodology was to determine statistically significant differences in sediment chemistry levels between Shipyard Sediment Site stations and reference stations. As shown in DTR Figure 18-4, TBT sediment chemistry levels were only available for 4 of the 18 sampling stations (SY 2231, SY2243, SY2433 and SY2441) selected for the reference pool thus preventing a comprehensive comparison of TBT levels at the Shipyard Sediment Site to the entire reference pool similar to what was done for the other CoCs.

The existing DTR Text in Section 18.2 will be revised to document the supporting rationale for not including TBT in the sediment chemistry LOE analysis. The revision will be provided on September 15, 2011 consistent with the Third Amended Order of Proceedings.

The exclusion of TBT in the sediment chemistry LOE analysis does not indicate a shortcoming in the Cleanup Team's overall consideration of TBT levels at the Shipyard Sediment Site. TBT was identified as one of several pollutants at the Shipyard Sediment Site that bioaccumulated in *Macoma nasuta* tissue and was therefore considered bioavailable to benthic organisms. (See DTR Section 19.1) The DTR also noted that TBT pre-remedial SWACs exceeded background levels at the reference stations by a factor of 7.3, the highest exceedance level of any of the COCs and describes TBT as having a high degree of association with the Shipyard Sediment Site. (See DTR Table 29-5) TBT was also identified as having a strong positive correlation with other pollutants suggesting that alternative cleanup levels for TBT would also achieve exposure reductions in other pollutants. (See DTR Section 29.3). Based on all of these considerations TBT was ultimately selected as one of five primary CoC's targeted for the development of alternative cleanup levels based on its high potential for exposure reduction.

#### **Non-Triad Approach Thresholds Are Appropriate.**

There are a total of 66 sample stations at the Shipyard Sediment Site. The Non-Triad Data Approach summarized in DTR Section 32.5.2 is based on an empirical evaluation of sediment contaminant concentrations at the 36 sample stations where toxicity and benthic community data

was not collected. The approach consists of the evaluation of the five primary COCs (copper, mercury, HPAH, PCBs and TBT in surface sediments at the site using two chemical threshold referred to as 1) Site-Specific Lowest Apparent Effects Thresholds (LAETs) for individual CoCs, and 2) Site-Specific Median Effects Quotient (SS-MEQ) to address combined effects of multiple COCs. Seven of the 36 Non-Triad stations were classified as “Likely” for chemically-associated impairment (SW01, SW05, SW10, SW16, SW20, SW24, and SW28). Stations SW01, SW05, SW16, and SW20 were identified based on an exceedance of the SS-MEQ threshold. Stations SW10, SW24, and SW28 were identified based on an exceedance of 60% of the LAET value for HPAHs (and exceedance of SS-MEQ threshold). (See DTR Table 32-23.) All of the polygons represented by these stations are included in the proposed remedial footprint (See DTR Figure 33-1).

***Apparent Effects Threshold (AET).*** The first line of evidence in the Non-Triad Data Approach, the AET, is a nationally recognized empirical SQG used for identifying concentrations of a pollutant in sediment above which adverse biological effects are always expected. When multiple site-specific effects endpoints are measured, several AET values can be combined to derive a single set of AET values by conservatively applying the lowest of any of the individual AET values for each chemical. This is known as the lowest AET or LAET. (See DTR Section 32 at page 32-31). Under the DTR approach, correlations were developed between COC contaminant levels and seven separate empirical measures of adverse effects on benthic macro invertebrates: amphipod survival, echinoderm fertilization, bivalve larval development, total abundance, number of taxa present, benthic response index (BRI), and Shannon-Weiner diversity index. As pointed out by BAE Systems in its rebuttal "three of these tests (i.e., all except the echinoderm test) are identified as the preferred tests for use as part of the California Sediment Quality Objectives (SQOs) although, as described in the DTR, the Site is explicitly exempt from regulation by the SQOs". BAE Systems also correctly points out in their comment letter that there is strong precedent for using LAET SQGs, as they form the basis of the Sediment Management Standards for Washington State (Ecology 1995) and the approach used to develop the LAETs, has been reviewed and approved for site-specific use by U.S. EPA's Science Advisory Board.

To provide an additional margin of protection, the LAETs derived from the site-specific Triad data were reduced to 60 percent of the calculated value (60%LAETs), and these 60%LAETs were used to assess individual chemicals at the Non-Triad stations. (See DTR Section 32 at page 32-31). The 40 % safety factor obtained from the 60 percent reduction of the LAET calculated value was applied by the Cleanup Team based on best professional judgement considerations to account for potential overestimates of toxicity thresholds in the LAET calculation. This buffer could for example address the possibility of outlier sediment samples such as suggested by SDG&E in their comment letter that exhibit extremely high contaminant concentrations and a lack of adverse biological effects resulting in an inappropriately high AET value. Another consideration warranting a safety buffer is the uncertainties inherent in using an empirical SQG method that does not provide a definitive cause and effect relationship in the analysis of matched sediment chemistry and biological effects data to reliably predict toxicity thresholds. The Cleanup Team concurs with NASSCO's rebuttal comments that although the AET methodology does not, by itself, prove causality; it provides valuable site-specific causal information on individual substances. AET methodology is both chemical specific and entirely reliant on site-

specific empirical data. Based on all of these considerations the Cleanup Team concluded that the 60%LAET threshold is an appropriate tool for assessing contaminant concentrations to predict the likelihood of sediment chemical-derived effects on the benthic macroinvertebrate community at the 36 Non-Triad stations.

***Site-Specific Median Effects Quotient (SS-MEQ).*** As described in DTR Section 32.5.2, the second line of evidence used in the Non-triad data approach is the Site-Specific Median Effects Quotient (SS-MEQ). SS-MEQ values for each of the 36 Non-Triad stations were derived by dividing concentrations of each of the five primary Site CoCs in sediment by Site-specific "SS-Median" values. SS-Median values were derived by calculating the median concentrations of the five COCs at the six stations identified with a "Likely" Triad classification. If the SS-MEQ value at a Non-Triad Data station exceeded a value of 0.9, it was considered to indicate a result similar to a Triad "Likely" classification, and thus, was assumed to indicate aquatic life beneficial use impairment. The SS-MEQ threshold of 0.9 was established by conservatively optimizing the performance of the quotient in predicting likely effects based on Site data. This scientifically credible approach for the development of a sediment chemistry threshold is based upon site specific relationships between the stressor pollutant exposure and biological response and is one of several approaches supported under the Bays and Estuaries Plan. (See Section H. Development of Site Specific Sediment Quality Guidelines, Page 27.)

SDG&E correctly points out that chemical causality can only be inferred from the SS-MEQ analysis rather than measured directly. SDG&E comments also correctly point out that the SS-MEQ does not explicitly incorporate bioavailability considerations, such as total organic carbon (TOC), pH, acid volatile sulfides (AVS), and simultaneously extracted metals (SEM) which can provide better insight on benthic effects than measured bulk sediment chemical concentrations such as normalization of concentrations of organic compounds in sediment by the amount of organic carbon. However the SS-MEQ is an effects based tool that indirectly incorporates bioavailability considerations. The predictive reliability of the SS-MEQ was evaluated, and the threshold value of 0.9 was selected, using the site-specific effects determinations for the 30 Triad stations, as well as the 5 supplemental Triad stations sampled at the Site. The data presented in DTR Table 32-21 and the supporting calculations in DTR Table A32-11 demonstrate that the SS-MEQ has an overall reliability of 70 percent, for identifying station polygons that are "likely" impacted. Moreover the SS-MEQ 0.9 threshold was demonstrated by other data in DTR 32-21 and DTR Table A32-11 to be biased toward being environmentally protective by minimizing "false negatives" (i.e., predicting that a station is not likely impaired when triad data indicate it is likely impaired).

For example the predictive ability of the SS-MEQ 0.9 threshold to accurately predict sediment locations that are "not likely" impaired was calculated at 94 percent (i.e., 16 of 17 predictions) based on the data contained in DTR Table A32-11. The ability of the threshold SS-MEQ of 0.9 to accurately predict "likely impairment" (referred to as likely efficiency in Table A32-11 of the DTR) was only 38 percent (i.e., 5 of 13 predictions). The Cleanup Team agrees with BAE Systems' assessment in its comment letter that the predictive reliability data indicate there is a high degree of confidence that polygons with SS-MEQ values less than 0.9 are not likely to be impaired. Therefore the decision to exclude all polygons with SS-MEQ values less than 0.9 from the remedial footprint is protective of the aquatic life beneficial use. Conversely there is

less confidence that polygons with SS-MEQ values greater than 0.9 are likely to be impaired. Thus the conservative decision to include all polygons areas with SS-MEQ values greater than 0.9 in the remedial footprint is also appropriately protective of the aquatic life beneficial use because it is weighted in the direction of including polygon areas that may not be impaired along with those that are impaired.

***Supplemental Triad Study to Confirm Thresholds.*** The validity of the SS-MEQ/60% LAET approach is protective for the aquatic life beneficial use at the Non-Triad stations for and was further confirmed in the supplemental Triad study described in DTR Section 35.5.2. At all five stations considered in the study, the SS-MEQ/60% LAET thresholds successfully predicted the absence of “Likely” benthic community impacts.

Regarding the comment about the error in Table 33-6, the table has been revised to delete the bullet point "All CoCs below 60% LAET values" for Polygon NA07. Revisions to the DTR will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

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## RESPONSE 18.5

**DTR Section:** 18

**Comments Submitted By:** BAE Systems

**Comment IDs:** 163

**Comment**

Responses to MacDonald’s Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

Comment C.2.6 that “The procedures that were used to designate sediment samples from the Shipyard Sediment Site as ‘Likely’ impacted are not protective” is Misleading and Unsupported (DTR § 18.3; DTR Table 18-7)

The methods used in the DTR to evaluate sediment at the Site were selected in large part to be consistent with those recommended by EPA, as well as those commonly used to evaluate contaminated sediment sites in the U.S. by sediment quality practitioners. Comment C.2.6 of MacDonald 3/11/11 Expert Report states that “The procedures that were used to designate sediment samples from the Shipyard Sediment Site as “Likely” impacted are not protective.”

MacDonald states that “the approach to defining the normal range of amphipod responses is not consistent with the practices that are currently recommended by the Science Advisory Group on Sediment Quality Assessment”, and cites Sustainable Fisheries Foundation (2007) as the basis for that assertion. This statement is highly misleading because it provides the impression that there exists a formal science advisory group (potentially with governmental agency endorsement), and that the citation is a substantive document. In his October 2010 deposition, MacDonald stated that this advisory group was “an informal group of individuals who have a common interest in sediment quality assessments, that share information, meet from time to time to discuss technical issues.” (MacDonald Deposition, at pp. 82-85.) He also stated that “all of the participants fund their own participation”, “there is no headquarters”, and “there is no website.” (Id.) MacDonald further acknowledged that there is no formal group structure, no president, and no official list of members other than an email list. The citation provided by MacDonald is the



unpublished proceedings of a workshop convened in British Columbia by the Sustainable Fisheries Foundation, a non-profit environmental organization of which MacDonald is one of the two Executive Directors. The purpose of the workshop was to advise the British Columbia Ministry of the Environment on sediment quality issues.

The “Science Advisory Group” referred to by MacDonald is simply an informal group of people with a common interest in sediment quality that has no formal charter, no endorsement or support by a governmental resource agency, no independent funding, no regulatory authority, and no formal advisory role. In addition, the citation referred to by MacDonald above is an unpublished summary of a workshop designed to advise a Canadian governmental agency, and sponsored by a non-profit environmental organization of which MacDonald is an Executive Director. It is clear that there is little independent and substantive support for MacDonald’s assertion that the methods used for the Site are inconsistent with the common practice.

In contrast to MacDonald’s assertion and citation discussed above, EPA has provided clear guidance on the selection of reference areas for environmental assessments (e.g., U.S. EPA 1994, 1997, 1999, 2000, 2005, 2006). A number of these EPA guidance documents are summarized in Section 17.2 of the DTR. Briefly, the EPA guidance recommends that reference areas reflect the habitat conditions and background levels of chemical contamination that would exist at a study site in the absence of site-related sediment contamination. The background conditions can incorporate levels of chemical contamination or biological responses that are considered representative of the general conditions in a water body removed from major contaminant sources. Therefore, consistent with EPA guidance (and stated Section 17.2 of the DTR), the selection of the reference areas for the Site was “consistent with the San Diego Water Board’s goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination.” MacDonald’s assertion that the selection of reference areas for the Site was inconsistent with current guidance is therefore incorrect, because the selection process was consistent with EPA guidance.

MacDonald states that the inclusion of reference stations with values of amphipod survival less than 80 percent is inappropriate. However, if such a selection criterion was used at the Site, it could potentially ignore the full range of amphipod responses that may occur in valid reference areas of San Diego Bay, and bias the reference envelope to fit a pre-conceived notion of what the minimum level of survival in a reference area should be. In contrast, the Washington State Sediment Management Standards (Ecology 1995), recognize that survival in the 10-d amphipod test based on *Rhepoxynius abronius* from reference areas can be as low as 75 percent, based on a survey conducted in multiple reference areas of Puget Sound, Washington. In addition, Phillips et al. (2001) identified control-adjusted survival thresholds as low as 75 and 77 percent for amphipod tests based on *Eohaustorius estuarius* and *Rhepoxynius abronius*, respectively.

In addition to MacDonald’s unwarranted definition of the acceptable levels of amphipod survival in reference areas, his focus only on the sediment toxicity results for the reference stations is inappropriate because it ignores the additional information on sediment chemistry and benthic macroinvertebrate communities that was used to identify the reference stations for the Site. As

documented in Table 17-2 of the DTR, each reference station was carefully evaluated using multiple lines of evidence before it was selected for use. MacDonald's focus on a single line of evidence (i.e., sediment toxicity) is therefore inconsistent with a weight-of-evidence evaluation and therefore inappropriate.

### **Response 18.5**

The Cleanup Team generally agrees with the comment. The approach taken in the TCAO and DTR is consistent with U.S. EPA guidance and is a reasonable approach in accordance with Resolution No. 92-49.

The criteria for selecting the DTR reference pool described in DTR Section 17 included low levels of anthropogenic pollutant concentrations, locations remote from pollution sources, similar biological habitat to the Shipyard Sediment Site, sediment total organic carbon (TOC) and grain size profiles similar to the Shipyard Sediment Site, adequate sample size for statistical analysis, and sediment quality data comparability. The DTR reference pool was also selected to represent contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination. Selection of the reference pool required some degree of compromise to meet the somewhat ambiguous requirement of a reference site "substantially free" of contaminants, yet having physical and chemical characteristics and biological parameters "broadly similar" to the contaminated marine sediment, and reflective of conditions "that existed before the discharge." (See DTR Section 17.1, Page 17-3).

If amphipod survival of less than 80% were excluded from the reference pool, the analysis would ignore valid reference areas data in San Diego Bay indicating biological effects which are reflective of the natural variability in toxicity and benthic conditions that can occur from factors other than sediment contamination. Benthic community composition for example can be affected by stress factors that are not contaminant induced such as natural variations in habitat (e.g. sediment grain size and organic content) environmental factors (e.g. water depth, salinity, and temperature) and physical disturbance (e.g. anchor or prop wash). Measurements of sediment toxicity can also be influenced by variety of factors besides sediment contamination such as test imprecision, and the presence of natural factors such as hydrogen sulfide or ammonia. Sediment toxicity test results may also not have a consistent correlation with biological effects because the toxicity test species and species that compose the benthic communities may have different sensitivities to different contaminants. The exclusion of stations exhibiting amphipod survival of less than 80% would inappropriately bias the analysis to in favor of a pre-conceived notion concerning what the minimum level of survival in reference areas should be. These considerations are described in further detail in DTR section 17.2.

The Cleanup Team was also unable to locate information on the "Science Advisory Group on Sediment Quality Assessment," and documentation on guideline recommendations from the group (see Section 32, Response 32.8).

## **RESPONSE 18.6**

**DTR Section:** 18

**Comments Submitted By:** BAE Systems

**Comment IDs:** 179

### **Comment**

Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

Conclusion C.3.5 that "The calculations of the 95% prediction limits were unduly influenced by inclusion of data for reference sediment samples that had unacceptably low amphipod survival, bivalve normal development, and/or sea urchin fertilization...For the bivalve toxicity test endpoint, insufficient data were compiled to support calculation of a valid reference envelope" is Invalid (DTR § 18.3; DTR Tables 18-7, 18-8 and 18-9)

The DTR describes how the reference stations for the sediment toxicity tests were carefully selected to represent the range of chemical concentrations and biological responses found in areas removed from contaminant sources in San Diego Bay. Conclusion C.3.5 of MacDonald 3/11/11 Expert Report states that "The calculations of the 95% prediction limits were unduly influenced by inclusion of data for reference sediment samples that had unacceptably low amphipod survival, bivalve normal development, and/or sea urchin fertilization." "For the bivalve toxicity test endpoint, insufficient data were compiled to support calculation of a valid reference envelope."

These conclusions are invalid, as described in detail in the response to Comments C.2.6. The methods used for the Site are consistent with EPA guidance, as well as the methods commonly used to assess sediment toxicity at contaminated sediment sites in the U.S. In addition, as described in Section 17.2 of the DTR, the methods are "consistent with the San Diego Water Board's goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination." MacDonald's assertion regarding the reference area data is therefore invalid.

### **Response 18.6**

The Cleanup Team agrees with the comment that identifies the rationale provided in Section 17.2 of the DTR regarding the approach used to identify reference sediment quality conditions found in other relatively cleaner areas of San Diego Bay not affected by the Shipyard Sediment Site. Also, see Response 18.5, above.

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## 19. TCAO Finding 19 and DTR Section 19: Bioaccumulation

Finding 19 of CAO No. R9-2011-0001 states:

The San Diego Water Board evaluated initial laboratory bioaccumulation test data to ascertain the bioaccumulation potential of the sediment chemical pollutants at the Shipyard Sediment Site. Examination of laboratory test data on the chemical pollutant concentrations in tissue of the clam *Macoma nasuta* relative to the pollutant concentrations in sediment indicates that bioaccumulation of chemical pollutants is occurring at the Shipyard Sediment Site. The data indicates for several chemical pollutants that concentrations in *Macoma nasuta* tissue increase proportionally as chemical pollutant concentrations in sediment increase. Statistically significant relationships were found for arsenic, copper, lead, mercury, zinc, tributyltin (TBT), PCBs, and high molecular weight polynuclear aromatic hydrocarbons (HPAHs). These chemical pollutants have a bioaccumulation potential at the Shipyard Sediment Site and are therefore considered bioavailable to benthic organisms. No statistically significant relationships were found for cadmium, chromium, nickel, selenium, silver, or PCTs.

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### RESPONSE 19.1

**DTR Section:** 19

**Comments Submitted By:** NASSCO, BAE Systems, Port District, Coastkeeper and EHC

**Comment IDs:** 119, 261, 407, 462, 481

#### **Comment**

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**The bioaccumulation data is incorrectly interpreted (NASSCO and BAE).** The DTR cites the finding that “bioaccumulation is occurring at the shipyard” as one basis for concluding that aquatic life at the site is impacted. DTR, at 14-1, 19-1. However, the DTR’s conclusion that Site sediments impact aquatic life is overly-conservative, since substances may bioaccumulate in laboratory tests, but not adversely affect the benthic community and because not all shipyard chemicals were found to bioaccumulate.

Narrative water quality objectives applicable to the Site require that “all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.” DTR, at 1-13 (citing the Water Quality Control Plan for the San Diego Basin, September 8, 1994). However, Staff’s *Macoma* tissue bioaccumulation testing indicates only that chemicals are present in the exposed *Macoma*; it does not assess whether the presence of such chemicals are at levels sufficient to cause toxicity or detrimental physiological responses, in violation of the water quality objective.

Considering the possibility that a substance could bioaccumulate in a laboratory test, yet not be associated with actual adverse effects to the benthic community, these results (together with direct evidence showing a mature and thriving benthic community at the Site), suggest Staff’s conclusions concerning benthic harms are overstated.

San Diego Coastkeeper and EHC commented that the DTR correctly interpreted the bioaccumulation data. The Port District conclude's that the contaminants are bioaccumulating in biota relevant to human health.

**CoCs are bioaccumulating in biota (Port District).** COCs are bioaccumulating in biota for the following reasons:

- a. Laboratory exposures to site-collected sediments established that statistically significant accumulations of selected contaminants (arsenic, copper, lead, mercury, zinc, TBT, total PCBs, and high molecular weight PAHs) occur in clams that are in direct contact with and ingest contaminated sediments, providing evidence that Site sediments contribute to the contaminant residues in the tissues of benthic organisms.
- b. Benthic organisms are an important component of marine food webs and are a major component of the diet for both the sand bass and spiny lobster as well as many other fish, invertebrate and bird species.
- c. Many of the fish and shellfish that prey upon contaminated benthic organisms within the Site can be consumed by people, are highly mobile and can migrate off the Site throughout large portions of San Diego Bay. These mechanisms contribute to the transfer of contaminants from the sediment to higher order receptors (including those relevant to human exposure) outside of the Site. The life histories of sand bass and spiny lobster, the two species targeted for human health evaluation at the Site, involve migration over large portions of San Diego Bay?
- d. PCBs are bioaccumulative, and cleanup is necessary for incremental improvement in the beneficial use of San Diego Bay by recreational and subsistence fishers.

**The bioaccumulation data is correctly interpreted (Coastkeeper and EHC).** Both BAE and NASSCO criticize the DTR's use of the Macoma bioaccumulation data as "contrary" to San Diego Bay's narrative water quality objective for toxicity. This argument is unconvincing, irrelevant, and weak for several reasons. First, the DTR and Order address the narrative water quality objective through the evaluation of multiple lines of evidence. The Macoma data demonstrates that potentially harmful chemicals in the sediments at the Shipyard Site are in a form that can accumulate in tissues of organisms. See DTR Finding 19. This critical information supplements the assessments done to measure compliance with the narrative toxicity water quality standard—it is not "contrary" to it. Further, a sediment quality assessment need not be limited to collecting the information that is required to support evaluation of attainment of the water quality objectives.

### **Response 19.1**

TCAO Finding 19 and the supporting DTR Section 19 were not intended to further determine whether the pollutants are adversely affecting benthic organisms in violation of the Basin Plan's narrative toxicity water quality objective. Potential adverse effects to the benthic community were analyzed using the Sediment Quality Triad approach as described in TCAO Findings 16 through 18. The Sediment Quality Triad approach provides the basis for the Cleanup Team's conclusion that the pollutants present in sediment at the Shipyard Sediment Site are impairing the benthic community (See TCAO Findings 16-18).

TCAO Finding 19 and the supporting DTR Section 19 describe the Cleanup Team's evaluation of the bioaccumulation of contaminants at the Shipyard Sediment Site in the benthic pathway. The bioaccumulation tests involved the exposure of the clam *Macoma nasuta* to site and reference sediment for 28 days using the protocols specified by ASTM (2000). *Macoma* was selected as the test species for the bioaccumulation tests because it is native to the West Coast and actively ingests surface sediment (likely to be the most direct route of exposure to contaminants that accumulate in tissues). The evaluation of the chemical pollutant concentrations in *Macoma* tissue relative to the chemical pollutant concentrations in the sediment indicates that bioaccumulation of chemicals is occurring at the Shipyard Sediment Site. Statistically significant tissue: sediment relationships (at  $p = 0.05$ ) were found for arsenic, copper, lead, mercury, zinc, TBT, PCBs, and HPAHs. These chemical pollutants have a bioaccumulation potential at the Shipyard Sediment Site and are therefore considered bioavailable to benthic organisms. These pollutants are available for biological uptake by benthic organisms at the Site and can accumulate in their tissues. DTR Section 19 (p.19-1) specifically provides that the bioavailability does not necessarily indicate the presence of adverse effects in benthic organisms.

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## **20. TCAO Finding 20 and DTR Section 20: Indicator Sediment Chemicals**

Finding 20 of CAO No. R9-2011-0001 states:

The San Diego Water Board evaluated the relationships between sediment chemical pollutants and biological responses to identify indicator chemical pollutants that may be impacting aquatic life and would therefore be candidates for assignment of cleanup levels or remediation goals. A two-step process was conducted. The first step in the selection of indicator chemicals was to identify chemicals representative of the major classes of sediment pollutants: metals, butyltins, PCBs and PCTs, PAHs, and petroleum hydrocarbons. The second step was the evaluation of relationships between these chemicals and biological responses. Results of the three toxicity tests, benthic community assessment, and bioaccumulation testing conducted in Phase 1 of the Shipyard study were all used to evaluate the potential of such relationships. Chemical pollutants were selected as indicator chemicals if they had any statistically significant relationship with amphipod mortality, echinoderm fertilization, bivalve development, total benthic macroinvertebrate abundance, total benthic macroinvertebrate richness, or tissue chemical concentrations in *Macoma nasuta*. Chemical pollutants selected as indicator chemicals include arsenic, copper, lead, mercury, zinc, TBT, total PCB homologs, diesel range organics (DRO), and residual range organics (RRO).

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The San Diego Water Board did not receive any comments regarding Finding 20 and DTR Section 20.

## **21. TCAO Finding 21 and DTR Section 21: Aquatic-Dependent Wildlife Impairment**

Finding 21 of CAO No. R9-2011-0001 states:

Aquatic-dependent wildlife beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. Aquatic-dependent wildlife beneficial uses include: Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), and Rare, Threatened, or Endangered Species (RARE). This finding is based on the considerations described below in the *Impairment of Aquatic-Dependent Wildlife Beneficial Uses* section of this CAO.

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The San Diego Water Board did not receive any comments regarding Finding 21 and DTR Section 21.



## **22. TCAO Finding 22 and DTR Section 22: Risk Assessment Approach for Aquatic-Dependent Wildlife**

Finding 22 of CAO No. R9-2011-0001 states:

The San Diego Water Board evaluated potential risks to aquatic-dependent wildlife from chemical pollutants present in the sediment at the Shipyard Sediment Site based on a two-tier approach. The Tier I screening level risk assessment was based on tissue data derived from the exposure of the clam *Macoma nasuta* to site sediments for 28 days using the protocols specified by American Society of Testing Material (ASTM). The Tier II baseline comprehensive risk assessment was based on tissue data derived from resident fish and shellfish caught within and adjacent to the Shipyard Sediment Site.

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The San Diego Water Board did not receive any comments regarding Finding 22 and DTR Section 22.

## **23. TCAO Finding 23 and DTR Section 23: Tier 1 Screening Level Risk Assessment for Aquatic-Dependent Wildlife**

Finding 23 of CAO No. R9-2011-0001 states:

The Tier I risk assessment objectives were to determine whether or not Shipyard Sediment Site conditions pose a potential unacceptable risk to aquatic-dependent wildlife receptors of concern and to identify whether a comprehensive, site-specific risk assessment was warranted (i.e., Tier II baseline risk assessment). The receptors of concern selected for the assessment include: California least tern (*Sterna antillarum brownie*), California brown pelican (*Pelecanus occidentalis californicus*), Western grebe (*Aechmophorus occidentalis*), Surf scoter (*Melanitta perspicillata*), California sea lion (*Zalophus californianus*), and East Pacific green turtle (*Chelonia mydas agassizii*). Chemical pollutant concentrations measured in clam tissue derived from laboratory bioaccumulation tests were used to estimate chemical exposure to these receptors of concern. Based on the Tier I screening level risk assessment results, there is a potential risk to all receptors of concern ingesting prey caught at the Shipyard Sediment Site. The chemical pollutants in *Macoma* tissue posing a potential risk include arsenic, copper, lead, zinc, benzo[a]pyrene (BAP), and total PCBs. The results of the Tier I risk assessment indicated that a Tier II baseline comprehensive risk assessment was warranted.

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The San Diego Water Board did not receive any comments regarding Finding 23 and DTR Section 23.

## 24. TCAO Finding 24 and DTR Section 24: Tier II Baseline Comprehensive Risk Assessment for Aquatic-Dependent Wildlife

Finding 24 of CAO No. R9-2011-0001 states:

The Tier II risk assessment objective was to more conclusively determine whether or not Shipyard Sediment Site conditions pose an unacceptable risk to aquatic-dependent wildlife receptors of concern. The receptors of concern selected for the assessment include: California least tern (*Sterna antillarum brownie*), California brown pelican (*Pelecanus occidentalis californicus*), Western grebe (*Aechmophorus occidentalis*), Surf scoter (*Melanitta perspicillata*), California sea lion (*Zalophus californianus*), and East Pacific green turtle (*Chelonia mydas agassizii*). Based on the Tier I screening level risk assessment results, there is a potential risk to all receptors of concern ingesting prey caught at the Shipyard Sediment Site and so a Tier II assessment was conducted. To focus the risk assessment, prey items were collected within four assessment units at the Shipyard Sediment Site and from a reference area located across the bay from the site. Chemical concentrations measured in fish were used to estimate chemical exposure for the least tern, western grebe, brown pelican, and sea lion and chemical concentrations in benthic mussels and eelgrass were used to estimate chemical pollutant exposure for the surf scoter and green turtle, respectively. Based on the Tier II risk assessment results, ingestion of prey items caught within all four assessment units at the Shipyard Sediment Site poses an increased risk above reference to all receptors of concern (excluding the sea lion). The chemicals in prey tissue posing a risk include BAP, PCBs, copper, lead, mercury, and zinc.

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### RESPONSE 24.1

**DTR Section:** 24

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 105, 120, 143, 144, 147, 468, 489

**Comment**

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NASSCO, BAE Systems, and SDG&E commented that the DTR's Tier II risk assessment conducted for human health was overly conservative, employed unrealistic assumptions, and did not comply with relevant state and federal guidance. The overly conservative and unrealistic assumptions include:

1. **Area Use Factor (Comment ID 105, 120, 144, and 468).** Staff assumed an area use factor ("AUF") of 1.0 for all receptors. This means that Staff assumed that the six receptors of concern—including the California least tern, California brown pelican, Western grebe, Surf scoter, California sea lion, and East Pacific green turtle—all derived 100% of their diet from prey obtained from the Shipyard. DTR, at Section 24.2.2, Table 24-6. This assumption is wholly unrealistic for all six receptors, and significantly magnified the hazard quotient for every single receptor. Not only are the home ranges of all six species substantially greater than the 43 acre NASSCO Shipyard area, but also it defies belief that any receptor would choose to only forage an active industrial Shipyard where the

habitat quality is low for all six indicator species.

Staff's failure to consider the actual AUF for the six indicator species did not comport with U.S.E.P.A. or California Department of Toxic Substances Control guidance documents on how to perform an ecological risk assessment. Nor did Staff rely on any studies, guidelines, or agency documents when it made this policy decision, or conduct any study of its own to determine the actual use the six receptors at the NASSCO Shipyard. Accordingly, not only did Staff's resolve to utilize an AUF of 1.0 lead to the conclusion of impairment, but also it was an arbitrary policy decision, which neither comports with realistic assumption nor standard ecological risk assessment guidance. Therefore, it is an arbitrary and capricious determination in the TCAO and DTR that should be reversed and aquatic-dependent wildlife conclusions reworked.

Coastkeeper & EHC also provided comments related to the security measures and wildlife exposure: Even if the Site will remain as a secured shipyard until at least 2040, security measures will not prevent humans and wildlife from being exposed to pollutants from the Site. While security measures may limit human exposure to the pollutants at the Site, they will not prevent wildlife exposure to the contaminants that occur at the Site. Securing the Site does not prevent fish or other aquatic life from swimming in and out of the site, nor does it prevent people or wildlife from catching and consuming wildlife exposed to contaminants at the Site. Therefore, people are still at risk of being exposed to pollutants remaining at the Site despite security measures at the Site.

2. **Tissue Residue Value Geometric Mean (Comment ID 489).** It is standard practice to set a limit for acceptable dietary exposure for any chemical by picking a point between an established no-observed-adverse-effect-level ("NOAEL") (a level of exposure that is believed to have no adverse effects on receptors of concern) and the lowest-observed-adverse-effect-level ("LOAEL") (the lowest level of exposure shown to have adverse effects on receptors of concern). In fact, "[e]xposure levels between the no-effect and expected effect thresholds fall into an undefined area with regard to predicted risk, in which careful interpretation and professional judgment are required to assess risk." ("the actual threshold of adverse effects is predicted to lie somewhere between these two thresholds").

Instead of carefully exercising such judgment, however, the Staff simplistically looked for any chemical that exceeded a hazard quotient of 1.0 for any effect threshold—whether it be a no-effect or expected-effect threshold—that was also higher than reference exposure. Neither the DTR nor the TCAO provide any rationale for this approach, despite the fact that U.S.E.P.A. staff have recommended using the geometric mean between no-effect and expected-effect thresholds as an appropriate way to calculate hazard quotients.

3. **No Studies Cited (Comment ID 147).** Moreover, it is worth noting that the neither the DTR nor the TCAO cite any studies demonstrating adverse impacts on

the California least tern, California brown pelican, Western grebe, Surf scoter, California sea lion, or East Pacific green turtle in San Diego Bay.

### **Response 24.1**

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The DTR describes a two-tiered approach in DTR Sections 21 through 24 to evaluate potential risks to aquatic-dependent wildlife from chemical pollutants present at the Shipyard Sediment Site. The Tier I screening level risk assessment used conservative exposure and effects assumptions in the risk assessment calculations. The Tier II comprehensive risk assessment (also referred to as the baseline risk assessment) used the same risk assessment equations to calculate risk as Tier I but substituted site-specific exposure parameters for the conservative assumptions used in Tier I to more accurately characterize potential risk to receptors.

The Tier II risk assessment objective was to more conclusively determine whether or not the current conditions at the Shipyard Sediment Site pose unacceptable risk to aquatic-dependent wildlife receptors of concern and to identify the need for remedial action (DTR Section 24.2). Risks were characterized by: (1) quantifying the risks at the Shipyard Sediment Site, and (2) comparing the Site risks to the risks calculated at the reference areas. Fish-eating marine birds and mammals, mollusk-eating birds, and sea grass-eating reptiles were identified as important groups of aquatic-dependent wildlife that could be at risk due to exposure of chemicals in prey species at the Shipyard Sediment Site. Six species were identified as suitable representatives for assessing potential risk to these groups with the concurrence of U.S. Fish and Wildlife Services, California Department of Fish and Game, and National Oceanic Atmospheric Administration (collectively known as the “Natural Resource Trustee Agencies”). The six species are shown in Table 24-4 of the DTR. In the Tier II risk assessment, the primary routes of exposure to pollutants at the Shipyard Sediment Site are through the ingestion of prey items and the incidental ingestion of sediment during foraging. The exposure assumptions for these six species contained in Table 24-6 of the DTR are reasonably conservative and realistic in terms of beneficial use impairment.

A recurring theme in NASSCO, BAE Systems, and SDG&E arguments is that the DTR Tier II aquatic dependent wildlife risk assessment is overly conservative, employs unrealistic assumptions, and does not comply with relevant state and federal guidance. The Cleanup Team conducted key elements of the Tier II risk assessment in accordance with the approach described in the relevant federal guidance, U.S. EPA’s “*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (Interim Final)*”.(See SAR293004). This document provides guidance to U.S. EPA Regions concerning how the Agency intends to exercise its discretion in implementing one aspect of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedy selection process at CERCLA-based cleanup sites. The Shipyard Sediment Site is not a CERCLA based cleanup site and any San Diego Water Board decisions regarding beneficial use impairments, risk assessments, remedial selection and other aspects of the TCAO will be made based on the requirements of the Water Code and applicable California Code of Regulations. The U.S. EPA guidance document is not a regulation itself and it does not

impose any legally-binding requirements on the conduct of the Cleanup Team's aquatic dependent wildlife risk assessment for the Shipyard Sediment Site or on the San Diego Water Board's issuance of a Cleanup and Abatement Order pursuant to Water Code Section 13304. The Cleanup Team had full discretion to adopt approaches and assumptions on a case-by-case basis that differ from the U.S. EPA guidance document and it did so where appropriate to meet California Water Code requirements. One example of this was in the Cleanup Team's conservative assumptions about exposure and consumption in the Tier II risk assessment calculations. The duty to ensure restoration and enhancement of beneficial uses under Division 7 of the California Water Code *demand*s that the San Diego Water Board make more conservative assumptions about exposure, consumption, and risk than would be appropriate under CERCLA's cost-driven remediation scheme for which the federal risk assessment guidance document was designed. (See Response 1.1 for additional details on key differences between the Water Code and CERCLA).

The Cleanup Team also conducted elements of the Tier II risk assessment in accordance with the approach described in the relevant state guidance, California Department of Toxic Substances Control (DTSC) "*Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities*" (See SAR281171). This document provides guidance to DTSC Regional Offices, and other government employees and contractors on a general framework for conducting ecological risk assessments at CERCLA AND Health and Safety Code based hazardous waste sites and facilities sites regulated by DTSC. The guidance does not constitute rule making by DTSC and should not be interpreted as an enforceable standard. The Shipyard Sediment Site is not a DTSC based cleanup site and any San Diego Water Board decisions regarding beneficial use impairments, risk assessments, remedial selection and other aspects of the TCAO will be made based on the requirements of the California Water Code and applicable California Code of Regulations. The DTSC guidance document is not a regulation itself and it does not impose any legally-binding requirements on the conduct of the Cleanup Team's aquatic dependent wildlife risk assessment for the Shipyard Sediment Site or on the San Diego Water Board's issuance of a Cleanup and Abatement Order pursuant to Water Code Section 13304.

The basis for the exposure and effects characterization parameters used in the Tier II assessment is discussed below.

**The Area Use Factor in the DTR Provides Full Protection of Aquatic-Dependent Wildlife Beneficial Uses**

The purpose of the Tier II aquatic dependent wildlife assessment described in TCAO Finding 24 and DTR Section 24 is to characterize the threat of pollutant bioaccumulation in aquatic life to levels that are harmful to aquatic dependent wildlife by indirect contaminant exposure. Indirect contaminant exposure of aquatic dependent wildlife at the Shipyard Sediment Site can result from the wildlife consumption of contaminated prey via bioaccumulation and trophic transfer. Shipyard Sediment Site pollutants accumulated in the tissue of organisms in the aquatic food web can be passed on to feeding aquatic dependent wildlife. The Cleanup Team considered the prey tissue route

of contaminant exposure to wildlife by assessing the risk to wildlife posed by indirect exposure using accepted U.S. EPA and California DTSC guidance for conducting ecological risk assessments of this type (See DTR 24.2).

The general equations used in the risk analysis to provide exposure estimates for aquatic dependent wildlife employ an area use factor (AUF) to adjust the estimated total daily contaminant intake to account for food obtained by wildlife. (See DTR Section 24.2.2.) The AUF term is used to adjust estimated total daily intake to account for food obtained from outside the area of concern. The value assigned to the AUF can be determined by computing the ratio of the species foraging range acres or hectares to the size of the study area. Depending on the species and the study area the AUF may be any value ranging from 0 to 1.0. An AUF value of 1.0 indicates that the species conducts all of its foraging and therefore obtains all of its food from within the area of concern.

The Cleanup Team selected six wildlife species as suitable representative receptors for conducting the risk analysis: CA least tern, CA brown pelican, Western grebe, Surf scoter, CA sea lion, and East Pacific green turtle. The six wildlife species all have documented foraging areas much larger than the 143 acre Shipyard Sediment Site and thus would likely consume only a portion of their food from the Shipyard Sediment Site. (See Exponent Report 2003). The Cleanup Team's selection of an AUF of 1.0 in the risk analysis may overestimate the exposure of the receptors to Site contaminants based on the likely extent of their foraging areas, but is nonetheless a reasonable protective assumption to employ in the aquatic dependent wildlife risk analysis based on the following considerations:

1. San Diego Bay provides important habitat for myriad of aquatic and aquatic-dependent wildlife species. The Bay serves as an integral migratory stopover and wintering area for shorebirds seabirds and waterfowl in the Pacific flyway. It also supports significant breeding colonies of elegant tern (*Sterna elegans*), royal tern (*Sterna maxima*), Forsters tern (*Sterna forstari*), gull-billed tern (*Sterna nllotica*), Caspian tern (*Sterna caspia*), black skimmer (*Rhynchops niger*), and double-crested cormorant (*Phalacrocorax auritus*). Federally listed endangered species that are dependent upon the Bay include Western snowy plover (*Charadrius alexandrinus nivosus*), California brown pelican (*Peficanus occidentalis californicus*), light-footed clapper rail (*Rallus longirostris levipes*), California least tern (*Stema antillarum browni*) and the threatened green sea turtle (*Chelonia mydas*). The USFWS established Sweetwater Marsh and South San Diego Bay National Wildlife Refuges NWRs are in close proximity to the Shipyard Sediment Site and encompass most of what remains of San Diego Bay historic salt marsh and intertidal mudflat habitats. All of these species and resources could potentially be affected by poor water quality and sediment contamination in San Diego Bay (See SAR281726).
2. Evaluation of the contamination exposure of the six representative receptors is influenced by many species specific and site specific factors such as sediment organic content, complexity of the food web, contaminant distribution and

- bioavailability, and variability in species-specific age, feeding habits, home range and lipid content. Assessing these factors in evaluating the specific contaminant exposure from a site is challenging and the estimation of receptor exposures only to contaminants at a site is typically highly uncertain.
3. Due to the uncertainties involved, the exposure factors used for receptors in the risk analysis include the conservative assumption that the receptors are present at the Shipyard Sediment Site year-round and that they obtain all of their food from the Shipyard Sediment Site. The receptor specific fraction of foraging that may occur at the Site was not factored into the risk analysis, an AUF of 1 was assumed and dietary exposure was calculated on a site-wide basis. Although the conservative AUF assumption may overestimate the risk of exposure of wildlife it helps to ensure that contaminant tissue levels used in the risk analysis are not under-predicted and are biased in a beneficial use protective direction.
  4. The AUF of 1 assumption should be protective of all wildlife receptor species some of which may reside in the area year round and for which the San Diego Bay constitutes 100% of the foraging range.
  5. The DTR Tier II assumption that all six receptors of concern ingest 100% of their prey from the Shipyard Sediment Site ensures the reasonable protection of aquatic-dependent wildlife beneficial uses designated for San Diego Bay. While the DTR deviated from U.S. EPA Superfund guidance and DTSC guidance by not comparing the foraging range of the six receptors to the size of the Site, the DTR use of an area use factor of 100% is based primarily on providing full protection of the Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), and Rare, Threatened, or Endangered Species (RARE) beneficial uses. WILD, BIOL, and RARE beneficial uses at the Shipyard Sediment Site would not be considered fully protected if a receptor is limited to only ingesting prey items a fraction of the time (e.g., 0.4 percent for the CA brown pelican within the area inside the NASSCO leasehold [Exponent 2003]).
  6. Although the Shipyard Sediment Site is currently a heavily industrialized shipyard area which may discourage aquatic-dependent wildlife from foraging at the Site, it is not unreasonable to assume that in the future NASSCO and BAE Systems may not occupy the Site, the land use may change, and the Site may become an attractive spot for wildlife feeding. Eel grass beds exist at both NASSCO and BAE Systems which provide rich feeding areas for fish and marine birds and mammals. This scenario, to a certain extent, recently occurred at a former shipyard facility located just north of the Site in San Diego Bay. Campbell Shipyard ceased operations and the site was redeveloped into a public and commercial recreational area.



**The Tissue Residue Value Geometric Mean in the DTR Provides Full Protection of Aquatic-Dependent Wildlife Beneficial Uses**

Characterizing potential adverse effects to aquatic-dependent wildlife receptors of concern requires a comparison of the exposure estimates to an appropriate toxicity reference value (TRV). As recommended by the Natural Resource Trustee Agencies, the DTR used TRVs developed by the U.S. Navy/U.S. EPA Region 9 Biological Technical Assistance Group (BTAG) (DTR Section 23.2.3). The BTAG TRVs are presented as an upper and lower estimate of effects thresholds (low-TRVs and high-TRVs, respectively). The low-TRV is based on no-observed-adverse-effects levels (NOAELs) and represents thresholds below which no adverse effects are expected. Conversely, the high-TRV is based on an approximate midpoint of the range of effects levels and represents a threshold above which adverse effects are likely to occur. The range between the low-TRV and high-TRV is commonly viewed as a "gray area" because the actual threshold of adverse effects is predicted to lie somewhere between these two thresholds. It should be noted that the terms low-TRV and high-TRV are interchangeable with the terms NOAEL and lowest-observed-adverse-effects-level, respectively. As such, to simplify the terminology, NOAELs and LOAELs will be used from this point out to respond to the comment.

NOAELs and LOAELs were used in two separate sections of the DTR: DTR Section 24.2.3 - Tier II risk assessment to determine if aquatic-dependent wildlife beneficial uses are impaired, and DTR Section 32.3 - Risk analysis to determine if the alternative cleanup levels are protective of aquatic-dependent wildlife beneficial uses. In DTR Section 24.2.3 a point was not selected between the NOAEL and LOAEL in the beneficial use impairment analysis. In DTR Section 32.3 a point was selected using the geometric mean between the NOAEL and LOAEL for the protective verification analysis of the alternative cleanup levels. While it may appear there is a disconnect between the two DTR sections, selecting a point for the alternative cleanup level analysis only is consistent with the recommendations made by the U.S. EPA ecological risk assessors cited in Comment ID 489 and quoted below (SETAC, 2005. Abstract 225, Page 53).

"Ecological risk assessment (ERA) guidance for Superfund states that clean-up goals for contaminants should be selected within the risk range or between the no observed and low observed effect levels (NOAEL and LOAEL). The Rule of Five, a visual tool based on a geometric progression of five nodes between the NOAEL and LOAEL, provides a flexible framework for selecting a defensible, clean-up goal for ecological risk receptors."

The Cleanup Team's decision to not select a point between the NOAEL and LOAEL for the DTR section 24.2.3 beneficial use impairment analysis is due to the "gray area" between the NOAEL and LOAEL. The actual threshold of adverse effects is predicted to lie somewhere in this gray area and as such; it is not unreasonable to assume that the threshold is just above the NOAEL. The NOAEL is the highest concentration at which chronic exposure causes no observed adverse effects; adverse effects begin to be observed at exposure concentrations greater than the NOAEL.

This assumption was used in DTR Section 24.2.3 in order to remain conservative, to ensure risks are not underestimated, and to ensure the full protection of aquatic-dependent wildlife beneficial uses.

**Citing Studies Showing Adverse Effects to the Tier II Receptors of Concern is not Necessary**

The Cleanup Team disagrees that aquatic life and aquatic-dependent wildlife beneficial uses are not impaired. See responses pertaining to aquatic life beneficial use impairment in Sections 14 to 19. While it would be desirable to cite studies showing adverse effects on the receptors of concern used in the Tier II analysis, the Cleanup Team is not aware of any such studies. More importantly, the Tier II risk assessment provides a sufficient basis to support TCAO Finding 21 that aquatic-dependent wildlife beneficial uses are impaired.

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## **25. TCAO Finding 25 and DTR Section 25: Human Health Impairment**

Finding 25 of CAO No. R9-2011-0001 states:

Human health beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site. Human health beneficial uses include: Contact Water Recreation (REC-1), Non-contact Water Recreation (REC-2), Shellfish Harvesting (SHELL), and Commercial and Sport Fishing (COMM). This finding is based on the considerations described below in this *Impairment of Human Health Beneficial Uses* section of the CAO.

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### **RESPONSE 25.1**

**DTR Section:** 25

**Comments Submitted By:** BAE Systems

**Comment IDs:** 121

#### **Comment**

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Human Health Beneficial Uses REC-1 and REC-2 are Not Adversely Impacted by Concentrations of Pollutants Present in the Marine Sediment At the Site (TCAO Finding 25; DTR § 25.1).

Finding 25 of the TCAO concludes that four identified beneficial uses (REC-1, REC-2, SHELL, and COMM) are “impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site.” Section 25.1 of the DTR identifies the same four beneficial uses, and states “concentrations of the pollutants present in the marine sediment within and adjacent to the Shipyard Sediment Site causes or threatens to cause a condition of pollution or contamination that adversely impacts these four beneficial uses and thereby constitutes a threat to the public health.” (DTR, § 25.1) (emphasis added).

Finding 25 of the TCAO and § 25.1 of the DTR Section 25.1 should be revised to clarify that the Cleanup Team did not find human health risks associated with the beneficial uses Contact Water Recreation (REC-1) and Non-Contract Water Recreation (REC-2) to be impaired by the pollutants present in the marine sediment within and adjacent to the Site.

#### **Response 25.1**

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DTR Section 27.2.1 states that the most significant potential source of human exposure to chemical pollutants at the Shipyard Sediment Site is through consumption of fish and shellfish that may have bioaccumulated chemicals either directly from site sediment or through the food web. This conclusion was based on several considerations including:

1. Risks associated with dermal contact and incidental ingestion of contaminated sediment by swimmers were considered minimal based on available U.S. EPA literature, and
2. Direct contact with sediment chemical pollutants at the Shipyard Sediment Site was not considered a likely exposure pathway to humans because the industrial nature of the site

and the lack of a beach make swimming and wading a highly unlikely event.

Accordingly, the DTR human health risk assessment was directed towards evaluation of human health risks associated with fish and shellfish consumption. Finding 25 will be revised by deleting REC1 and REC-2 beneficial uses from the finding. This revision will be provided on September 15, 2011 consistent with the Third Amended Order of Proceedings.

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## **26. TCAO Finding 26 and DTR Section 26: Risk Assessment Approach for Human Health**

Finding 26 of CAO No. R9-2011-0001 states:

The San Diego Water Board evaluated potential risks to human health from chemical pollutants present in the sediment at the Shipyard Sediment Site based on a two-tier approach. The Tier I screening level risk assessment was based on tissue data derived from the exposure of the clam *Macoma nasuta* to site sediments for 28 days using ASTM protocols. The Tier II baseline comprehensive risk assessment was based on tissue data derived from resident fish and shellfish caught within and adjacent to the Shipyard Sediment Site. Two types of receptors (i.e., members of the population or individuals at risk) were evaluated:

- a. Recreational Anglers – Persons who eat the fish and/or shellfish they catch recreationally; and
- b. Subsistence Anglers – Persons who fish for food, for economic and/or cultural reasons, and for whom the fish and/or shellfish caught is a major source of protein in their diet.

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The San Diego Water Board did not receive any comments regarding Finding 26 and DTR Section 26.

## **27. TCAO Finding 27 and DTR Section 27: Tier I Screening Level Risk Assessment for Human Health**

Finding 27 of CAO No. R9-2011-0001 states:

The Tier I risk assessment objectives were to determine whether or not Shipyard Sediment Site conditions potentially pose an unacceptable risk to human health and to identify if a comprehensive, site-specific risk assessment was warranted (i.e., Tier II baseline risk assessment). The receptors of concern identified for Tier I are recreational anglers and subsistence anglers. Recreational anglers represent those who eat the fish and/or shellfish they catch recreationally and subsistence anglers represent those who fish for food, for economic and/or cultural reasons, and for whom the fish and/or shellfish caught is a major source of protein in the diet. Chemical concentrations measured in *Macoma nasuta* tissue derived from laboratory bioaccumulation tests were used to estimate chemical exposure for these receptors of concern. Based on the Tier I screening level risk assessment results, there is a potential risk greater than that in reference areas to recreational and subsistence anglers ingesting fish and shellfish caught at the Shipyard Sediment Site. The chemicals in *Macoma* tissue posing a potential risk include arsenic, BAP, PCBs, and TBT.

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### **RESPONSE 27.1**

**DTR Section:** 27

**Comments Submitted By:** NASSCO

**Comment IDs:** 153

#### **Comment**

The Tier I Risk Assessment conducted by Staff used *Macoma nasuta* tissue from laboratory exposures to conduct the screening level assessment for human health risk. This was inappropriate because an appropriate “surrogate” species should show ecological and physiological similarities to a species that would naturally occur at the Shipyard and be harvested by humans. In fact, *Macoma nasuta* is relatively rare at the NASSCO Shipyard, and is not subject to recreational harvesting by humans in California or elsewhere.

#### **Response 27.1**

The use of *Macoma* tissue as a surrogate to estimate exposures to chemicals in seafood for the Tier I risk analysis is both reasonable and scientifically valid. The DTR recognizes that use of *Macoma* tissue is a conservative approach because *Macoma* is not the primary seafood harvested from the Shipyard Sediment Site and because *Macoma* are directly exposed to pollutants in the sediment. *Macoma* actively ingests sediment to feed on detritus and burrows into the sediment. This is the most likely direct route of exposure to contaminants that accumulate in tissues. However, the use of *Macoma* tissue to evaluate the bioaccumulation potential of the chemical pollutants present in sediment at the Shipyard Sediment Site and the degree to which these chemicals may enter the aquatic food web is a valid tool to both evaluate the potential for human health beneficial use impairment attributable to bioaccumulation and to ensure the protection of human health beneficial uses. Furthermore, *Macoma* tissue has been commonly used for this purpose in other Tier I human health risk assessments including the TMDL study for the mouths

Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

of Chollas Creek and Paleta Creek in San Diego Bay (SCCWRP and U.S. Navy, 2005;  
SAR286743 and SAR286582) and Hunters Point Shipyard in San Francisco Bay (Battelle et. al.  
2002).

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## **28. TCAO Finding 28 and DTR Section 28: Tier II Baseline Comprehensive Risk Assessment for Human Health**

Finding 28 of CAO No. R9-2011-0001 states:

The Tier II risk assessment objective was to more conclusively determine whether Shipyard Sediment Site conditions pose unacceptable cancer and non-cancer health risks to recreational and subsistence anglers. Fish and shellfish were collected within four assessment units at the Shipyard Sediment Site and from two reference areas located across the bay from the Shipyard Site. Chemical concentrations measured in fish fillets and edible shellfish tissue were used to estimate chemical exposure for recreational anglers and chemical concentrations in fish whole bodies and shellfish whole bodies were used to estimate chemical exposure for subsistence anglers. Based on the Tier II risk assessment results, ingestion of fish and shellfish caught within all four assessment units at the Shipyard Sediment Site poses a theoretical increased cancer and non-cancer risk greater than that in reference areas to recreational and subsistence anglers. The chemicals posing theoretical increased cancer risks include inorganic arsenic and PCBs. The chemicals posing theoretical increased non-cancer risks include cadmium, copper, mercury, and PCBs.

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### **RESPONSE 28.1**

**DTR Section:** 28

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 11, 99, 122, 123, 125, 126, 128, 150, 151, 154, 182, 270, 271, 272, 273, 274, 485, 486, 487, 488

#### **Comment**

NASSCO, BAE Systems, and SDG&E commented that the DTR's Tier II risk assessment conducted for human health was overly conservative, employed unrealistic assumptions, and did not comply with relevant state and federal guidance (IDs 99, 122, 150, 154, 487, and 488). The overly conservative and unrealistic assumptions include:

1. **Fractional Intake (IDs 11, 123, 125, 151, 274, and 486).** The DTR assumed that the Fractional Intake ("FI") of recreational and subsistence anglers that catch and eat fish and/or lobster from San Diego Bay would come entirely from fish and/or lobsters caught at the Shipyard Sediment Site. The Shipyard Sediment Site is a high-security area due to its work for the U.S. Navy, and is characterized by a lack of public access. In San Diego Bay, a security boom prevents unauthorized vessels from approaching any closer than 300 feet from the Shipyard. From the shore, unauthorized personnel are prohibited from accessing the Shipyard by security guards, buildings, eight foot fences with razor wire, video surveillance, and alarm systems, and even approved guests are escorted around the site at all times. These security measures absolutely prevent any unauthorized access to the Shipyard.
2. **Maximum Tissue Chemical Concentrations (ID 273).** The use of maximum chemical concentrations to represent tissue chemical concentrations yields a biased and potentially inaccurate estimate of health risk. Staff assumes that maximum measured chemical



concentrations are representative of typical exposure for recreational and subsistence fishers, despite the fact that multiple samples were collected at each sampling station. DTR, at 28-17. This simplistic approach “gives no insight as to the potential variability in the risk estimates as a function of the range and frequency of measured contaminant levels. In essence, each of the risk estimates presented by the RWQCB relies on a single measured (in this case, maximum) value, which can yield a highly biased risk estimate, particularly if the underlying data set is skewed.”

3. **Consumption Rate (IDs 126 and 271).** Staff assume that subsistence anglers always consume the entire fish or shellfish, including the skin, guts, filter organs, etc., and not just the filet or edible portion. DTR, at 28-17. However, assuming that all subsistence anglers always consume the entire fish is excessively conservative, particularly when Staff has not shown that any subsistence anglers actually fish at or near the shipyard, or investigated how often such anglers, if any exist, would consume the entire fish. With respect to lobsters, there is no evidence in the DTR that subsistence anglers could harvest enough lobsters from the shipyard to maintain a 30 year daily consumption rate of 161 g/day, or that all such lobsters would be eaten whole, including the shell, internal organs and meat. Regarding fish, while it is true that certain ethnic groups may use the whole body of harvested fish in soups or stews, members of such groups typically “gut” the fish to remove the liver and other soft organs prior to consumption. In fact, the Santa Monica Bay seafood consumption study—which formed the basis for the consumption rates used in the DTR—found that only one percent of surveyed anglers consumed whole fish that had not been gutted. Thus, rather than blindly assuming that all anglers always consume un-gutted whole body fish, it would have been more reasonable to assume that a certain proportion of harvested seafood is consumed in this manner based on site-specific data.
4. **Exposure Duration (ID 128).** The RWQCB used the highest EPA default point estimate for exposure duration with no discussion, no explanation, and no justification. The RWQCB could have reviewed local census or creel angler data to develop a more accurate and site-specific estimate. They also could have explored alternative (and lower) default EPA estimates or used a distribution of estimates. Current EPA guidance recommends using an estimate of 9 years, which represents the 50th percentile (U.S. EPA 1997). The studies that this value are derived from reported average exposure duration times ranging from 4.6 years to 12 years (Israeli and Nelson 1992; Johnson and Capel 1992; U.S. Bureau of the Census 1993). It should be noted that the EPA is currently proposing that the default average duration be lowered to 8 years (U.S. EPA 2009). It does not appear that the RWQCB reviewed or considered any of this information.
5. **Inorganic Arsenic (ID 270).** Staff assume that four percent of arsenic is in the inorganic form. This is a highly conservative assumption. Staff chose this estimate without any justification, and Staff did not collect or analyze fish tissue from the NASSCO Shipyard for inorganic arsenic.

6. **Type of Fish and Shellfish (ID 272).** Staff assume that subsistence anglers only consume spotted sand bass or lobster, even though data from other species commonly available to anglers were available. For example, topsmelt (*Atherinops affinis*) and jacksmelt (*Atherinops californiensis*), both of which had much lower maximum concentrations of PCBs than spotted sand bass, typically comprise a significant proportion of the sport catch from shore and pier areas. Accordingly, to avoid overestimating exposure, the dietary portion assumed to be comprised of un-gutted whole body fish should have been apportioned across species according to expected catch rates since (1) San Diego Bay anglers very likely will catch many species other than lobster or spotted sand bass, and (2) chemical concentrations vary widely amongst different fish species. Moreover, it is clear from San Diego Bay-specific fishing reference materials that fish are not equally distributed throughout the Bay, but rather, fish are “attracted to certain habitats based on prey availability, physical structures, and hydrodynamic conditions.”
7. **Tier II Risk Assessment Recalculations (IDs 182 and 485).** Even if Staff assume that security restrictions do not make it impossible for the public to fish and collect shellfish in the Shipyard Sediment Site, using realistic exposure estimates to prepare a Tier II Risk Assessment reveals that fish and shellfish caught at the Shipyard Sediment Site do not pose a significant risk to human health.

### **Response 28.1**

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The DTR describes a two-tiered approach in DTR Sections 25 through 28 to evaluate potential risks to human health from chemical pollutants present at the Shipyard Sediment Site. The Tier I screening level risk assessment used conservative exposure and effects assumptions in the risk assessment calculations. The Tier II comprehensive risk assessment (also referred to as the baseline risk assessment) used the same risk assessment equations to calculate risk as Tier I but substituted site-specific exposure parameters for the conservative assumptions used in Tier I to more accurately characterize potential risk to receptors. (DTR Section 26.1).

The Tier II human health risk assessment objective was to more conclusively determine whether or not current conditions at the Shipyard Sediment Site pose unacceptable cancer and non-cancer health risks to human health and to identify the need for remedial action (DTR Section 28.2). Risks were characterized by: (1) quantifying the cancer and non-cancer risks at the Shipyard Sediment Site, and (2) comparing the Site risks to the risks calculated for the reference areas.

A recurring theme in NASSCO, BAE Systems, and SDG&E arguments is that the DTR’s Tier II human health risk assessment is overly conservative, employs unrealistic assumptions, and does not comply with relevant state and federal guidance. The Cleanup Team conducted key elements of the Tier II risk assessment in accordance with the approach described in the relevant federal guidance, U.S. EPA’s “*Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*” (U.S. EPA, 1989; SAR285909). This document provides guidance to U.S. EPA Regions concerning how the Agency intends to exercise its discretion in implementing one aspect of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedy selection process at CERCLA-based cleanup sites. The Shipyard Sediment Site is not a CERCLA based cleanup site and any San Diego Water Board decisions regarding beneficial use impairments, risk assessments, remedial selection and other

aspects of the TCAO will be made based on the requirements of the California Water Code and applicable California Code of Regulations. The U.S. EPA guidance document is not a regulation itself and it does not impose any legally-binding requirements on the conduct of the Cleanup Team's human health risk assessment for the Shipyard Sediment Site or on the San Diego Water Board's issuance of a Cleanup and Abatement Order pursuant to Water Code Section 13304. The Cleanup Team had full discretion to adopt approaches and assumptions on a case-by-case basis that differ from the U.S. EPA guidance document and it did so where appropriate to meet Water Code requirements. One example of this was in the Cleanup Team's conservative assumptions about exposure and consumption in the Tier II risk assessment calculations. The duty to ensure restoration and enhancement of beneficial uses under Division 7 of the Water Code *demands* that the San Diego Water Board make more conservative assumptions about exposure, consumption, and risk than would be appropriate under CERCLA's cost-driven remediation scheme for which the federal risk assessment guidance document was designed. (See Response 1.1 for additional details on key differences between the California Water Code and CERCLA).

The most significant potential source of human exposure to pollutants at the Shipyard Sediment Site is through consumption of fish and shellfish that may have bioaccumulated chemicals either directly from site sediments or through the food web. (See DTR Section 27.2.1) In the Tier II risk assessment, exposure was based on an estimate of the reasonable maximum exposure (RME) expected to occur under both current and future land-used conditions in accordance with U.S. EPA risk assessment guidance (1989; SAR285909). The RME is defined as the highest exposure that is reasonably expected to occur at a site. Two types of receptors were evaluated in the assessment:

1. Recreational angler – represents those who eat the fish and/or the shellfish they catch; and
2. Subsistence angler – represents those who fish for food, for economic and/or cultural reasons, and for whom the fish and/or shellfish caught is a major source of protein in the diet.

The RME assumptions for these two receptors contained in DTR Table 28-7 are reasonably conservative, realistic and appropriate for making risk based decisions on human health beneficial use impairment. Additional considerations regarding the selection of exposure characterization parameters used in the risk assessment are discussed below.

**Fractional Intake Value of 1 is Appropriate, Reasonably Conservative, and Environmentally Protective**

COMM and SHELL are designated as existing beneficial uses for all of the waters of San Diego Bay and at all points within San Diego Bay regardless of property access restrictions in bay waters. In designating these uses for San Diego Bay and other waters, the San Diego Water Board made the finding that fishing, swimming, or other uses have actually occurred since November 28, 1975; or the water quality and quantity is suitable to allow the use to be attained (Basin Plan at p. 2-7). COMM and SHELL beneficial uses are designated for protection as

existing uses throughout San Diego Bay, including the Shipyard Sediment Site, even if no one is actually catching fish or harvesting shellfish at that location.

Federal and State antidegradation polices (see U.S. EPA 40 CFR 131.12(a)(1) and State Water Board Resolution No. 68-16) require the San Diego Water Board to protect existing and potential beneficial uses such as COMM and SHELL and the level of water quality needed to protect those uses. Full protection of the water and sediment quality needed to protect these uses requires protection throughout San Diego Bay including areas of the bay where public access is restricted. An activity or discharge that lowers water quality in San Diego Bay such that a buffer zone (e.g. site access restriction) must be implemented within COMM and SHELL beneficial use areas is inconsistent with the aforementioned federal and state antidegradation polices. NASSCO and BAE Systems do not own the waters of the State even if those waters happen to be currently surrounded by a security boom.

The Cleanup Team's selection of a fractional intake value of 1 for the DTR' Tier II assessment is based on an appropriate, reasonably conservative, and environmentally protective assumption that recreational and subsistence anglers catch and consume 100 percent of their seafood from the Shipyard Sediment Site. This assumption is used as a basis to both identify COMM and SHELL beneficial use impairment, and to minimize the potential for human exposure to pollutants through the food chain thereby ensuring the restoration and enhancement of COMM and SHELL beneficial uses at the Shipyard Sediment Site. The Cleanup Team considered the various arguments that (1) there is not a complete exposure pathway due to the security measures that prevent public access to the Shipyard Sediment Site, (2) there is no documentation in the administrative record that employees or U.S. Navy personnel fish at the Site, and (3) that the heavy industrial use at the Site described in the Port's Master Plan should be heavily weighed in the analysis. These arguments are simply not relevant to the San Diego Water Board's obligations to make conservative assumptions about exposure, consumption, and risk in order to ensure the restoration and enhancement of COMM and SHELL beneficial uses at the Shipyard Sediment Site. The use of a fractional intake of 100 percent in the DTR Tier II assessment is based primarily on the San Diego Water Board's statutory mandate under the Clean Water Act and California Water Code to ensure that the level of cleanup at the Shipyard Sediment Site will be protective of the COMM and SHELL beneficial uses.

Site access restrictions such as those at the Shipyard Sediment Site in San Diego Bay do not, preclude or limit the San Diego Water Board from taking action to preserve and enhance water quality and protect beneficial uses. The COMM and SHELL beneficial uses at the Shipyard Sediment Site would not be considered fully protected if an angler is limited to only catching and consuming fish and shellfish a fraction of the time (e.g., 3.4 percent from the area inside the NASSCO leasehold [Exponent 2003]). Furthermore, it is not unreasonable to assume that an angler, perhaps one who lives in the immediate vicinity of the Site, would return to the same location day after day to catch fish and shellfish for consumption. For example, in the future the Site may be available for recreational use and a public pier erected. It would not be unusual for an angler to do most or all of their fishing from one particular pier, especially if it is convenient to their residence. It is the San Diego Water Board's statutory responsibility under Water Code section 13241 to protect both existing and potential COMM and SHELL beneficial uses for the benefit of present and future generations.

The Cleanup Team recognizes that restricting Shipyard Sediment Site access is one type of institutional control sometimes applied to a National Priorities List "Superfund" site under CERCLA to reduce risk. However, the Shipyard Sediment Site is not a CERCLA "Superfund" site and restricting access doesn't result in improvements in water quality nor protect beneficial uses. Limiting public access to enjoy the COMM and SHELL beneficial use in San Diego Bay waters doesn't supersede the San Diego Water Board's statutory mandates under the Clean Water Act and California Water Code to protect water quality and beneficial uses and ensure that water quality standards are attained. To argue otherwise would be to say that a factory owner may discharge excessive levels of pollutants to a stream and impair beneficial uses as long as the factory owner restricts access to the stream.

### **Use of Maximum Tissue Chemical Concentrations are Reasonable**

U.S. EPA guidance (1989; SAR285909) recommends that the tissue chemical concentrations for the RME be either the 95 percent upper confidence level (95% UCL) on the arithmetic average concentration or the maximum concentration (whichever is lesser). However, the Cleanup Team used the maximum concentration to simplify the risk calculations and to avoid the uncertainties associated with calculating the 95% UCL using such a small sample size (n = 5). This same statistical issue came up during the development of the Reference Pool for determining aquatic life beneficial use impairment at the Shipyard Sediment Site (DTR Section 17). Originally, five reference stations were used to represent the reference sediment quality conditions, however, in order to conduct a robust statistical analyses an adequate sample size was needed. Therefore, the Reference Pool was increased from five reference stations to 18 reference stations.

Furthermore, the Tier II risk assessment results in the DTR remain the same for the recreational angler at NASSCO when using the lesser value of the 95% UCL and the maximum concentration. Table 2 of NASSCO's expert report (Finley, 2011; the Finley report) provides the exposure point concentrations for spotted sand bass fillet and lobster edible tissue and uses either the 95% UCL or the maximum concentration (whichever is lesser). The Cleanup Team used these exposure point concentrations to recalculate the potential cancer and non-cancer health risks to recreational anglers at NASSCO (inside and outside leasehold) and determined that there were no changes to the Tier II results presented in Table 28-1 of the DTR (See Appendix for Section 28 for calculations). While the Finley report did not provide exposure point concentrations for whole body sand bass and whole body lobster, it is reasonable to assume that the Tier II risks assessment results will likely remain the same for the subsistence angler at NASSCO.

**Figure 28-1**

<b>RISKS TO THE RECREATIONAL ANGLER FROM FISH INSIDE THE NASSCO LEASEHOLD (based on tissue chemical concentrations from Finley 2011)</b>													
<b>Inside NASSCO Fillet Sand Bass</b>													
<b>Recreational Angler:</b>	<b>C</b>	<b>CR</b>	<b>FI</b>	<b>ED</b>	<b>EF</b>	<b>BW</b>	<b>AT</b>	<b>CF</b>	<b>Dose (mg/kg - day)</b>	<b>RfD</b>	<b>CSF</b>	<b>Cancer Risk</b>	<b>Noncancer Risk</b>
<b>Metals</b>													
Inorganic Arsenic (carcinogenic)	16	0.021	1	30	365	70	25550	1000	2.06E-06	--	1.5	3.09E-06	--
<b>Polychlorinated Biphenyls</b>													
Total PCBs (carcinogenic)	42.77	0.021	1	30	365	70	25550	1000	5.50E-06	--	2	1.10E-05	--
Total PCBs (noncarcinogenic)	42.77	0.021	1	30	365	70	10950	1000	1.28E-05	0.00002	--	--	6.42E-01
<b>Reference 2240 Fillet Sand Bass</b>													
<b>Recreational Angler:</b>	<b>C</b>	<b>CR</b>	<b>FI</b>	<b>ED</b>	<b>EF</b>	<b>BW</b>	<b>AT</b>	<b>CF</b>	<b>Dose (mg/kg - day)</b>	<b>RfD</b>	<b>CSF</b>	<b>Cancer Risk</b>	<b>Noncancer Risk</b>
<b>Metals</b>													
Inorganic Arsenic (carcinogenic)	16	0.021	1	30	365	70	25550	1000	2.06E-06	--	1.5	3.09E-06	--
<b>Polychlorinated Biphenyls</b>													
Total PCBs (carcinogenic)	47.8	0.021	1	30	365	70	25550	1000	6.15E-06	--	2	1.23E-05	
Total PCBs (noncarcinogenic)	47.8	0.021	1	30	365	70	10950	1000	1.43E-05	0.00002	--		7.17E-01
<b>NOTES:</b>													
C = Tissue chemical concentrations from Appendix A, Table 2 - Expert Report of Brent L. Finley, Ph.D., DABT dated March 11, 2011.													

**Figure 28-2**

**RISKS TO THE RECREATIONAL ANGLER FROM FISH OUTSIDE THE NASSCO LEASEHOLD  
 (based on tissue chemical concentrations from Finley 2011)**

**Outside NASSCO  
 Fillet Sand Bass**

Recreational Angler:	C	CR	FI	ED	EF	BW	AT	CF	Dose (mg/kg - day)	RfD	CSF	Cancer Risk	Noncancer Risk
<b>Metals</b>													
Inorganic Arsenic (carcinogenic)	20	0.021	1	30	365	70	25550	1000	2.57E-06	--	1.5	3.86E-06	--
<b>Polychlorinated Biphenyls</b>													
Total PCBs (carcinogenic)	49.18	0.021	1	30	365	70	25550	1000	6.32E-06	--	2	1.26E-05	--
Total PCBs (noncarcinogenic)	49.18	0.021	1	30	365	70	10950	1000	1.48E-05	0.00002	--	--	7.38E-01

**Reference 2240  
 Fillet Sand Bass**

Recreational Angler:	C	CR	FI	ED	EF	BW	AT	CF	Dose (mg/kg - day)	RfD	CSF	Cancer Risk	Noncancer Risk
<b>Metals</b>													
Inorganic Arsenic (carcinogenic)	16	0.021	1	30	365	70	25550	1000	2.06E-06	--	1.5	3.09E-06	--
<b>Polychlorinated Biphenyls</b>													
Total PCBs (carcinogenic)	47.8	0.021	1	30	365	70	25550	1000	6.15E-06	--	2	1.23E-05	--
Total PCBs (noncarcinogenic)	47.8	0.021	1	30	365	70	10950	1000	1.43E-05	0.00002	--	--	7.17E-01

NOTES:  
 C = Tissue chemical concentrations from Appendix A, Table 2 - Expert Report of Brent L. Finley, Ph.D., DABT dated March 11, 2011.

**It is Reasonable to Assume that Subsistence Anglers Consume the Entire Fish and Shellfish**

The DTR's assumed exposure parameter in DTR Section 28.2.2.1 that subsistence anglers always consume the entire fish and shellfish represents a reasonable RME scenario for subsistence anglers. There is evidence provided in the Santa Monica Bay Seafood Consumption Study (SCCWRP and MBC, 1994; SAR287043, Page 41) and the San Diego Bay Health Risk Study (County of San Diego, 1990; SAR281255, p. IV-17) that anglers consume the entire fish. The Santa Monica Bay study reported that about one percent of Hispanic and Asian anglers eat fish whole with intestines, while the San Diego Bay study reported that approximately 6 percent of Caucasians and approximately 40 percent of both Filipinos and Asians consume the entire fish. Furthermore, the DTR's assumption has been used in other human health risk evaluations for contaminated sediments in San Diego Bay. OEHHA, California's lead state agency charged with assessing health risks posed by hazardous substances throughout the State, provided comments on the Exponent 2003 report (SAR104180). The comments included calculations performed by OEHHA that used whole body lobster exposure parameters to determine cancer and non-cancer risk levels for subsistence anglers at the Shipyard Sediment Site. Additionally, whole body fish exposure parameters were used in the human health risk assessment for subsistence anglers at the former Naval Training Center (NTC) Boat Channel site in San Diego Bay (U.S. Navy, 2003, Page 7-7).

**It is Reasonable to Assume a 30-Year Exposure Duration**

The DTR's assumption of a 30-year exposure duration represents a reasonable RME scenario in accordance with the U.S. EPA guidance document (1989; SAR285909, Exhibit 6-15, p. 6-42). It is not unreasonable to assume that an angler, perhaps one who lives in the immediate vicinity of the Shipyard Sediment Site, would return to the same spot day after day to catch and consume seafood for 30 years. For example, in the future the Site may be available for recreational use and a public pier erected. It would not be unusual for an angler to do most or all of their fishing from one particular pier, especially if it is convenient to their residence. It would not be unusual for the same angler to catch and consume whole fish and whole lobster for 30 years due to their culture and financial situation. As demonstrated in the data summarized below, Barrio Logan and National City are located in close proximity to the Site where the residents in these two areas (1) represent a relatively large population of minorities, specifically Hispanics and Filipinos, as compared to San Diego County, (2) have a lower median income as compared to San Diego County, (3) and have a higher percentage of residents below the poverty line as compared to San Diego County. As such, these residents may rely upon seafood in San Diego Bay as a major food source.



Geographic Area	Ethnicity Percent of Community		Median Household Income	Individuals Below Poverty Line
	Hispanic	Asian		
Barrio Logan <sup>1</sup>	86%	2%	\$20,604	41%
National City <sup>2</sup>	59%	19% (of which, 17% are Filipino)	\$29,826	22%
San Diego County <sup>3</sup>	27%	9% (of which, 4% are Filipino)	\$47,067	12%

1. SANDAG, 2000 Census
2. U.S Census Bureau, 2000a and 2000b
3. U.S Census Bureau, 2000c and 2000d

Moreover, the San Diego Bay Health Risk Study (County of San Diego, 1990), summarized in DTR Section 1.5.3.2, reported that 74 percent of people who catch and consume fish from San Diego Bay are people of color. The 1990 study reported that consumption patterns of ethnic populations indicate that they tend to eat more fish in their diet and eat parts of the fish that have higher pollutant accumulation. This group of anglers, including their family members that may also consume fish and shellfish caught in San Diego Bay, has a disproportionately higher health risk from pollution in the San Diego Bay than other San Diego Bay anglers. (See DTR Section 1.5.3). Consistent with the principles of environmental justice defined in California law (Government Code Section 65040.12(e)), the San Diego Water Board must protect San Diego Bay beneficial uses in a manner that ensures the fair treatment of people of all races, cultures, and income levels. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

A failure to use appropriately conservative assumptions about exposure, by the San Diego Water Board in risk assessments and considerations of beneficial use impairment would violate principles of environmental justice because the health risk from regular consumption of fish caught in the San Diego Bay falls disproportionately on minority groups. Based on all of the foregoing considerations the Cleanup Team’s conservative assumption about exposure duration is fully consistent with the San Diego Water Board’s statutory responsibility to protect for COMM and SHELL beneficial for the benefit of present and future generations.

**It is Reasonable to Assume that 4 Percent Arsenic is in the Inorganic Form**

The DTR’s assumption that four percent arsenic is in the inorganic form is a reasonable assumption to ensure the protection of human health beneficial uses. The DTR Section 27.2.5 at page 27-13 recognizes that four percent is considered to be conservative because some studies have reported much smaller percentages. However in 1993 the U.S. Food and Drug Administration proposed a much higher percentage (10 percent) for

converting measurements of total arsenic in shellfish to estimates of inorganic arsenic (U.S. FDA, 1993). In fact, this percentage has been used in various fish and shellfish studies throughout the United States. For example, the 10 percent conversion factor was used by the U.S. Fish and Wildlife Service at Painted Turtle Pond (U.S. FWS, 2003), the U.S. EPA at Columbia River (U.S. EPA, 1996-1998, pp. 5-81) and by the Texas Department of State Health Services at Nueces Bay (Texas Department of State Health Services, 2005, p. 4). Additionally, U.S. EPA provides inorganic arsenic exposure estimates for high and average fish and shellfish consumers and assumes four percent arsenic is in the inorganic form for several exposure scenarios -- e.g., General Population/High Arsenic Scenario: average person who consumes fish or shellfish only occasionally but selects species with the high concentrations of inorganic arsenic (U.S. EPA, 1997a, Table 2, p. 13).

The Cleanup Team disagrees that the DTR cannot conclude that inorganic arsenic in seafood theoretically harvested at the NASSCO site 'poses a theoretical increased' cancer risk when compared to reference areas. The DTR uses reasonably conservative assumptions for the Tier II risk analysis to ensure protection of human health beneficial uses. As such, the chemicals posing theoretical increased cancer risks at the Shipyard Sediment Site include inorganic arsenic and PCBs and the chemicals posing theoretical increased non-cancer risks at the Shipyard Sediment Site include cadmium, copper, mercury, and PCBs (Finding 28).

**Use of Spotted Sand Bass and Lobsters in the Tier II Risk Assessment is Reasonable**

While the Cleanup Team recognizes that anglers may catch other species besides spotted sand bass and lobsters at the Shipyard Sediment Site, these two species are representative of fish and shellfish that have direct exposure to the pollutants in sediment. Topsmelt and jacksmelt are pelagic fish (i.e., fish that live near the surface or in the water column) that do not come in contact with bottom sediments. BAE Systems provided a response to the MacDonald (2011) expert report that supports the use of spotted sand bass and lobsters in the Tier II human health risk analysis (MacDonald, 2011, Section V.A.9., lines 16-27, page 47). The response specifically addresses spotted sand bass; however, it is also applicable to lobsters.

"The species selected for detailed evaluation at the Shipyard Sediment Site was the spotted sand bass (*Paralabrax maculatofasciatus*) because, as stated in Exponent (2003), this species preys primarily on benthic macroinvertebrates, exhibits limited spatial movements, and is abundant in numerous kinds of habitats within San Diego Bay, including the Shipyard Sediment Site (i.e., as documented during the fish sampling effort prior to the 2001/2001 sampling events). These characteristics of the spotted sand bass make it an appropriate species for assessing contaminant exposure at the Site. This determination is reinforced by the results of tissue chemistry analyses. Spotted sand bass were collected at four locations, inside and outside the leaseholds of both shipyards, and the results showed that chemical concentrations in fish tissue from inside the leaseholds were greater than concentrations in fish collected immediately outside the leaseholds

(Exponent 2003). The data therefore clearly indicate that spotted sand bass are sensitive to spatial differences in sediment chemistry concentrations at the Site.”

Furthermore, use of spotted sand bass is consistent with other human health risk assessments. For example, spotted sand bass and barred sand bass (also a benthic fish) were used in the risk analysis at the Former Naval Training Center - Boat Channel sediment investigation located in San Diego Bay (U.S. Navy, 2003). Spotted sand bass was used for the assumption on fillet consumption and barred sand bass was used for the assumption on whole body consumption.

**Tier II Exposure Assumptions are Reasonable and Ensures Protection of Human Health Beneficial Uses**

The Cleanup Team disagrees with the exposure assumptions used in the recalculation of human health hazard and risk estimates for the Shipyard Sediment Site. The input parameters used in the DTR's Tier II human health analysis are reasonable and ensure the protection of human health beneficial uses as previously discussed.

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**RESPONSE 28.2**

**DTR Section:** 28

**Comments Submitted By:** NASSCO

**Comment IDs:** 152

**Comment**

It would be a concern if fish and shellfish picked up contaminants at the NASSCO Shipyard, and then migrated into areas where they could be caught by San Diego Bay anglers. Accordingly, fish and lobster were caught inside the NASSCO Shipyard and at reference areas around San Diego Bay, and tissue concentrations of contaminants of concern were compared. The results demonstrated that there was no significant difference in the level of tissue concentrations for contaminants of concern between fish caught inside the NASSCO Shipyard, and at reference areas around San Diego Bay. The fact that fish tissue data collected from the NASSCO Shipyard is no different from tissue data collected from the reference areas “strongly suggests the discharges from the leasehold do not appear to have influenced fish tissue concentrations.”

**Response 28.2**

This comment was submitted as part of NASSCO’s argument that there is no significant risk to human health from consumption of fish attributable to Shipyard Sediment Site contaminants. NASSCO's comment lacks merit. The comment is specific to spotted sand bass. To support the comment, NASSCO references certain tables that reflect the results of a statistical test on the difference of means for fish tissue (fillet) inside of NASSCO relative to the reference sites. The comment is limited to an assessment of the means of fish fillet data and does not include an evaluation of whole body data, which, DTR Table 28-1 demonstrates would result in a cancer risk. Accordingly, NASSCO’S comment and the referenced tables do not support a TCAO finding that there is no significant risk to human health from consumption of fish attributable to Shipyard Sediment Site contaminants.

### RESPONSE 28.3

**DTR Section:** 28

**Comments Submitted By:** NASSCO

**Comment IDs:** 406

**Comment**

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None of Dr. Johns' (expert for the Port District) four assertions regarding human wildlife exposure and risk constitute scientifically valid evidence of existing or likely future beneficial use impairment from Site sediment contamination for the following reasons (Exhibit No. 3, Declaration of Expert Michael Johns, ¶ 5):

¶ 5.a. "Sediment contaminants are present, bioavailable, and bioaccumulative." Although this statement is supported by available data in the DTR in a qualitative sense, the presence, bioavailability, and bioaccumulative potential of chemicals do not, in and of themselves, constitute a human health risk or beneficial use impairment. Impairment cannot be assessed without a quantitative assessment of exposure and toxicity, which Dr. Johns does not provide.

¶ 5.b. "Fish and shellfish at the site contain harmful levels of contaminants to human anglers." This conclusion requires an exposure and toxicity assessment. Because Dr. Johns does not provide any such assessment, it appears he is relying solely on the Tier II human health risk assessment contained in the DTR, which is critically flawed. See Exponent, Evaluation of Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 for the NASSCO Shipyard Sediment Site, Expert Report of Thomas C. Ginn, Ph.D. (March 11, 2011) ("Ginn 2011"); Chemrisk, Brent Finley, Ph.D., Expert Opinion Letter Regarding the Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 (March 11, 2011) ("Finley 2011"). The DTR Tier II human health risk assessment for both recreational and subsistence anglers assumes a highly unrealistic fractional intake from the Site of 100 percent. A quantitative assessment with more realistic assumptions concerning fractional intake, conducted in a manner consistent with regulatory guidance and precedents, would conclude that no unacceptable risk for human anglers exists.

¶ 5.c. "The mobility of fish and lobsters indicates a risk to anglers who fish outside the Site boundaries." No quantitative exposure analysis is presented to substantiate this claim, and no analysis of off-site angler exposure is contained in the DTR. Site-related contaminants carried by motile fish and lobsters to areas frequented by anglers can only pose a risk to human consumers if they are caught and consumed in sufficient quantity and frequency to exceed chemical-specific toxicity thresholds. Without data to support this claim, it is purely speculative, and without scientific basis. Furthermore, the Ginn and Finley expert reports document that there is no risk to recreational or subsistence anglers.

¶ 5.d. "Shipyard activities disturb sediments, creating beneficial use impairment throughout the Bay." While it is likely, and Site-specific data support the notion that a

certain degree of vertical mixing and resuspension of buried sediments takes place within the Shipyard leasehold in areas where vessel movements and engine testing take place, there is no analysis of any kind presented to support Dr. Johns' assertion of Bay-wide impacts. The DTR does not contain any quantitative analysis of sediment transport beyond the site boundaries, and Dr. Johns does not claim to have performed any such analysis or present any evidence that would support his allegation of beneficial use impairment beyond the Shipyard Site boundaries.

### **Response 28.3**

The analysis supporting the conclusions in Dr. Johns' declaration appear to be based on the data and analysis set forth in the DTR and TCAO. The Cleanup Team agrees with Dr. Johns' conclusions which support the TCAO's findings that aquatic life and human health beneficial uses designated for San Diego Bay are impaired due to the elevated levels of pollutants present in the marine sediments at the Shipyard Sediment Site (Findings 14 and 28, respectively). Following are more detailed responses to NASSCO's comments:

5.a. Finding 19 of the TCAO states that "... chemical pollutants have a bioaccumulation potential at the Shipyard Sediment Site and are therefore considered bioavailable to benthic organisms." The Cleanup Team agrees that this Finding alone does not indicate beneficial use impairment. Rather, it provides supporting information on the bioaccumulation potential of the chemical pollutants present in sediment at the Shipyard Sediment Site and the degree to which these chemicals may enter the aquatic food web. Finding 19 was used as part of the multiple lines of evidence to evaluate the potential risks to aquatic life (Finding 15 of the TCAO). The Triad approach was primarily used to determine aquatic life impairment which qualitatively assessed the relationship between chemical concentrations and biological effects at the Shipyard Sediment Site (Section 18 of the DTR). For human health impairment, a tiered approach was used. The Tier I screening level risk assessment was based on bioaccumulation data in Finding 19 (tissue data derived from exposure of clams to site sediments) and the Tier II baseline risk assessment was based on tissue data from resident fish and shellfish (Sections 27 and 28 of the DTR, respectively).

5.b. The Cleanup Team disagrees that the DTR's Tier II human health risk assessment is critically flawed and that the fractional intake of 100 percent is unrealistic. See Response 28.1 to "Fractional Intake" comment above.

5.c. The Cleanup Team agrees that the DTR does not provide an analysis of the risk to anglers who fish outside the Site boundaries from the mobility of fish and lobsters. However, it is reasonable to assume that fish and lobsters that are exposed to the pollutants in Site sediments will travel elsewhere especially when physical disturbances occur within the leasehold (e.g., engine tests, propeller wash, and ship movements).

5.d. While the Cleanup Team agrees that the DTR does not contain any qualitative analysis of sediment transport beyond the site boundaries, it is reasonable to assume that this could occur due to the Shipyard activities within the leasehold.

## **RESPONSE 28.4**

**DTR Section:** 28

**Comments Submitted By:** BAE Systems

**Comment IDs:** 127

### **Comment**

The Regional Board cites to the Environmental Health Coalition (“EHC”) having conducted an “Opportunity” sample survey in 2002 of people fishing from piers near the Shipyard Sediment Site (the “EHC Fisher Survey”). (DTR, § 1.5.3.3.) The Regional Board adopts the EHC description of the survey as a “...selected sample that is highly exposed to fish from near the shipyards, Naval Station San Diego, and the Southern portion of the San Diego Bay.

The EHC Fish Survey should be disregarded entirely because it was not designed or conducted in a manner consistent with appropriate standards of survey design. (U.S. EPA 1992, 1998.) As a consequence, the survey results are most likely biased, are not representative, and do not provide any useful estimates of fish consumption.

### **Response 28.4**

The DTR contains text on p. 1-22 documenting that the San Diego Water Board recognizes the limitations of the EHC Survey of Fishers Report (EHC, 2005) that is cited in DTR Section 1.5.3.3. The Cleanup Team considered, but did not rely on the Survey of Fishers Report in developing any TCAO Finding, or in the selection of exposure parameters and supporting calculations used in the DTR human health risk assessment. For example, the fish and shellfish consumption rates used in the human health risk assessment (DTR Section 28) for recreational and subsistence anglers were based on a Santa Monica Bay Seafood Consumption Study (SCCWRP and MBC, 1994; SAR287043).

The San Diego Bay Health Risk Study (County of San Diego, 1990; SAR281255) and the Survey of Fishers Report (EHC, 2005) were both relied on to qualitatively support the conclusion that there are both recreational and subsistence anglers from a variety of ethnic groups consuming fish from San Diego Bay.

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## 29. TCAO Finding 29 and DTR Section 29: Chemicals of Concern and Background Sediment Quality

Finding 29 of CAO No. R9-2011-0001 states:

The San Diego Water Board derived sediment chemistry levels for use in evaluating the feasibility of cleanup to background sediment quality conditions from the pool of San Diego Bay reference stations described in Finding 17. The background sediment chemistry levels based on these reference stations are as follows:

### Background Sediment Chemistry Levels Chemicals of Concern

Chemicals of Concern	Units (dry weight)	Background Sediment Chemistry Levels <sup>1</sup>
<b>Primary COCs</b>		
Copper	mg/kg	121
Mercury	mg/kg	0.57
HPAHs <sup>2</sup>	µg/kg	663
PCBs <sup>3</sup>	µg/kg	84
Tributyltin	µg/kg	22
<b>Secondary COCs</b>		
Arsenic	mg/kg	7.5
Cadmium	mg/kg	0.33
Lead	mg/kg	53
Zinc	mg/kg	192

1. Equal to the 2005 Reference Pool's 95% upper predictive limits shown in Section 18 of the Technical Report. The background levels for metals are based on the % fines:metals regression using 50% fines, which is conservative because the mean fine grain sediment at the Shipyard Investigation Site is 70% fines.

2. HPAHs = sum of 6 PAHs: Fluoranthene, Perylene, Benzo[a]anthracene, Chrysene, Benzo[a]pyrene, and Dibenzo[a,h]anthracene.

3. PCBs = sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194, 201, and 206.

The San Diego Water Board identified constituents of primary concern (primary COCs), which are associated with the greatest exceedance of background and highest magnitude of potential risk at the Shipyard Sediment Site. A greater concentration relative to background suggests a stronger association with the Shipyard Sediment Site, and a higher potential for exposure reduction via remediation. Secondary contaminants of concern (secondary COCs) are contaminants with lower concentrations relative to background, and are highly correlated with primary COCs and would be addressed in a common remedial footprint. Based on these criteria, the primary COCs for the Shipyard Sediment Site are copper, mercury, HPAHs, 16 PCBs, and TBT, and the secondary COCs are arsenic, cadmium, lead, and zinc.

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The San Diego Water Board did not receive any comments regarding Finding 29 and DTR Section 29.

### **30. TCAO Finding 30 and DTR Section 30: Technological Feasibility Considerations**

Finding 30 of CAO No. R9-2011-0001 states:

Although there are complexities and difficulties that would need to be addressed and overcome (e.g. removal and handling of large volume of sediment; obstructions such as piers and ongoing shipyard operations; transportation and disposal of waste), it is technologically feasible to cleanup to the background sediment quality levels utilizing one or more remedial and disposal techniques. Mechanical dredging, subaqueous capping, and natural recovery have been successfully performed at numerous sites, including several in San Diego Bay, and many of these projects have successfully overcome the same types of operational limitations present at the Shipyard Sediment Site, such as piers and other obstructions, ship movements, and limited staging areas. Confined aquatic disposal or near-shore confined disposal facilities have also been employed in San Diego Bay and elsewhere, and may be evaluated as project alternatives for the management of sediment removed from the Shipyard Sediment Site.

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#### **RESPONSE 30.1**

**DTR Sections:** 30, 32, 34

**Comments Submitted By:** NASSCO

**Comment ID:** 159

#### **Comment**

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NASSCO commented that monitored natural attenuation is the proper remedy and that implementing the Order will cause greater harm to beneficial uses than no action.

According to NASSCO, implementing the large-scale dredging described in the TCAO will result in greater harm to beneficial uses than leaving sediments in place and allowing contaminants to attenuate naturally. See Exponent Report, at § 18.

First, sediments buried below approximately 10 cm do not impact the water or marine environment because they are below the biologically active zone, and are therefore not biologically available. Gibson Depo, at 156:3 – 157:12. However, if dredging is required, these contaminants may be re-suspended in the water column, causing the concentrations of contaminants in the water phase to increase. Response to NASSCO’s RFAs, at RFA No. 42 – 43.

Second, Site sediments are currently supporting a mature and thriving benthic community, with total abundance and richness comparable to reference areas. See discussion at Section III.A.2.c., supra. Sediment profile imaging also shows that the benthic community has attained a “mature equilibrium,” as classified by an independent testing organization. Id. Dredging sediments from portions of the leasehold would (1) result in the immediate destruction of many of the existing mature benthic macroinvertebrate communities located at the Site; (2) destroy existing eelgrass beds; (3) risk re-suspension of buried contaminants; and (4) risk re-colonization of Site sediments by invasive species. See Exponent Report, at 18-9; Barker Depo, at 306:22 – 307:21. Accordingly, if significant portions of the leasehold are dredged, there is no guarantee



that the healthy, mature benthic communities presently occupying the Site will return. Barker Depo, at 912:6 – 915:19 (confirming that Staff is unable to predict with any level of confidence what type of benthic community may be reestablished after dredging.

Further, any positive impacts resulting from dredging would depend on the extent and timeframe in which dredged sediments recover to the equivalent of reference conditions following the cleanup. *Id.* at 18-8. Because observed impairments are attributable to continuing off-site discharges from storm drains and Chollas Creek, the recovery of benthic communities in dredged areas could be impeded as contaminants from urban runoff continue to be deposited at the Site, resulting in minimal benefits. *Id.*, at 18-9.

Thus, dredging confers minimal benefits over natural attenuation, and risks serious detriment to beneficial uses. These negative impacts can and should be avoided, without compromising beneficial uses, by selecting monitored natural attenuation as the recommended remedy.

Additional discussion refuting MNA as an appropriate remedy is found in Response 1.1 at page 1-27, and in Response 32.1.

### **Response 30.1**

NASSCO'S argues that implementing the large-scale dredging described in the TCAO will result in greater harm to beneficial uses than leaving sediments in place and allowing contaminants to attenuate naturally. While the Cleanup Team disagrees with this assertion, it acknowledges that there are significant issues associated with dredging that could cause temporary adverse environmental effects at the Site while dredging is underway. All dredging equipment disturbs sediment and resuspends some fraction of it in the water column. Resuspended sediment and the associated contaminants can settle back to the bottom in the dredge cut; finergrained materials can remain in the water column and be transported to other locations. Those materials are deposited as residuals and result from dredging. Dissolved contaminants may also be released to the water during dredging from resuspended or exposed contaminated sediment. Dredging of contaminated sediment also disrupts the bottom substrate, thereby destroying the existing benthic community.

These adverse effects and risks can be mitigated through mandatory implementation of best management practices that limit resuspension and residual contamination during dredging in accordance with the following objectives:

- Sediment dredging should be conducted with sufficient accuracy such that contaminated sediment is removed and cleanup levels are met without unnecessary removal of clean sediment;
- Sediment dredging should be completed in a reasonable period of time under conditions compatible with subsequent transport for treatment or disposal;

- Sediment dredging should be conducted in a manner that minimizes and/or controls resuspension of contaminated sediments, downstream transport of resuspended sediments, and releases of contaminants of concern to water and air; and
- Sediments dredging should be conducted such that generation of residual contaminated sediment is minimized or controlled.

The removal of contaminated sediments via dredging will provide greater confidence in the long-term effectiveness of the cleanup in restoring and protecting beneficial uses.

The citation attributed to Mr. David Gibson's deposition on the biologically active zone (BAZ), is taken out of context. Mr. Gibson's response was commenting on the general depth of biologically active zones in soft-bottomed bays. It should be noted that the depth of the BAZ is site-specific and dependent upon multiple factors including, but not limited to, sediment grain size, organic material, current velocity, and disturbance. To illustrate this point, sediment profile imaging (SPI) in the 2003 Exponent Report (see Appendix A) was able to produce imaging at up to roughly 20 cm sediment depths within the Shipyard Sediment Site. The SPI documented organisms and burrows at depths deeper than 10 cm, and found burrows to at least 20 cm sediment depth. Similar results were also found in a sediment investigation at a different San Diego Bay site in 1999 (ARCADIS Geraghty & Miller, Inc., 1999), with the BAZ estimated at 20 cm.

NASSCO commented that, if dredging is required, these contaminants may be re-suspended in the water column, causing the concentrations of contaminants in the water phase to increase. Contaminants normally associated with environmental dredging tend to remain tightly bound to sediment particles, so control of resuspension will aid in the control of contaminant release (U.S. Army Corps of Engineers, 2008). This was found to be the case for U.S. EPA Case Studies of Environmental Dredging Projects (U.S. EPA, 2004), which found that when proper BMPs were implemented, dredging did not result in the release of PCBs to the water column (via water column sampling, acute toxicity testing and bioaccumulation). The data showed that if turbidity was contained, the sediment-related contamination was also contained.

NASSCO commented that dredging at the Shipyard Sediment Site would result in the immediate destruction of many of the existing mature benthic macroinvertebrate communities located at the Site and that if significant portions of the leasehold are dredged, there is no guarantee that the healthy, mature benthic communities presently occupying the Site will return. Destruction of the benthic community and removal of habitat is unavoidable with all dredging projects and represents an immediate negative effect to the existing benthic community. The US Army Corps of Engineers has noted that recovery after disturbance is typically relatively rapid with estimates of benthic recovery rates ranging from several months to several years. Immediately after destruction of the habitat, hardy, opportunistic organisms such as polychaetes and small bivalves can be expected to recolonize surficial sediments. Subsequently the population increases in diversity and abundance. Recovery occurs when the site returns to pre-disturbance conditions or does not differ significantly from a reference area. (NRC, 2007).

NASSCO also commented on the risk of re-colonization of the Site sediments by invasive species following dredging. It is important to note that the benthic community results (Exponent, 2003; Appendix K) clearly document that invasive species are already a part of what the NASSCO states is a “thriving” benthic community within the Shipyard Sediment Site. *Musculista senhousia*, for example, is a tolerant invasive mussel that causes benthic habitat alteration. This species is documented in all 29 polygons sampled within the Shipyard Sediment Site, often in high abundance. Of the five reference sites sampled, two found no *M. senhousia* and three reported numbers lower than most shipyard polygons.

NASSCO commented that dredging sediments from portions of the leasehold would destroy existing eelgrass beds. The removal of eelgrass (*Zostera marina*) beds will require mitigation to establish beds in accordance with the National Marine Fisheries Service Southern California Eelgrass Mitigation Policy. Thus, the adverse effect resulting from the removal of eelgrass will be temporal, and mitigated according to the “Mitigation Rule” either on-site or at an appropriate off-site location. (Note the term “Mitigation Rule” refers to new rules amending 40 CFR Parts 325 and 332 issued by U.S. EPA and the U.S. Army Corps of Engineers on March 31, 2008 governing compensatory mitigation for authorized impacts to wetlands, streams, and other waters of the U.S. under Section 404 of the Clean Water Act. )

NASSCO commented that because observed impairments are attributable to continuing off-site discharges from storm drains and Chollas Creek, the recovery of benthic communities in dredged areas could be impeded as contaminants from urban runoff continue to be deposited at the Site. There are several important factors to consider in evaluating NASSCO’S issue. The TCAO and DTR include requirements that the direct storm water discharges to the Site be investigated and mitigated (see TCAO Directive A.3-5), and Chollas Creek is currently undergoing a TMDL evaluation process. These actions will improve storm water runoff quality and prevent MS4 discharges from impairing benthic community recovery. Even if these actions did not occur, the commenters logic is unsound. A lack of remedial dredging and sand cover, combined with additional MS4 discharges, would theoretically result in continued impairment of the Shipyard Sediment Site. The combination of MS4 monitoring and post-remedial monitoring at the Shipyard Sediment Site (which occurs over time) should be able to detect changes attributable to MS4 discharges.

Lastly, it should be pointed out that many polygonal areas at the Shipyard Sediment Site were determined to not need remedial dredging or sand cover. “Natural attenuation” will be relied on in these areas to maintain or reduce pollutant concentrations. The long term trend of contaminant levels in these areas will be assessed under the TCAO’S post-remedial monitoring effort.

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### **31. TCAO Finding 31 and DTR Section 31: Economic Feasibility Considerations**

Finding 31 of CAO No. R9-2011-0001 states:

Under State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*, determining “economic feasibility” requires an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions. Resolution No. 92-49 provides that “[e]conomic feasibility does not refer to the dischargers’ ability to finance cleanup.” When considering appropriate cleanup levels under Resolution No. 92-49, the San Diego Water Board is charged with evaluating “economic feasibility” by estimating the costs to remediate constituents of concern at a site to background and the costs of implementing other alternative remedial levels. An economically feasible alternative cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.

The San Diego Water Board evaluated a number of criteria to determine risks, costs, and benefits associated with no action, cleanups to background sediment chemistry levels, and alternative cleanup levels greater than background concentrations. The criteria included factors such as total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife, and human health), effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources. The San Diego Water Board then compared these cost criteria against the benefits gained by diminishing exposure to the primary COCs to estimate the incremental benefit gained from reducing exposure based on the incremental costs of doing so. As set forth in detail herein, this comparison revealed that the incremental benefit of cleanup diminishes significantly with additional cost beyond a certain cleanup level, and asymptotically approaches zero as remediation approaches background. Based on these considerations, cleaning up to background sediment chemistry levels is not economically feasible.

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#### **RESPONSE 31.1**

**DTR Sections:** 31, 32.7.1

**Comments Submitted By:** Coastkeeper and EHC, NASSCO, BAE Systems, SDG&E

**Comment IDs:** 43, 44, 45, 46, 47, 49, 51, 52, 53, 55, 54, 56, 57, 58, 95, 96, 97, 98, 110, 294, 295, 296, 297, 298, 300, 301, 302, 303, 304, 305, 366, 370, 388, 421, 422, 423, 424, 435,

**Comment**

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Coastkeeper and EHC submitted a series of comments on the economic feasibility analysis in Section 31 (cleanup to background) and Section 32.7.1 (lowest alternative cleanup levels). A comment by SDG&E was also submitted. These comments, along with rebuttal, are organized below in the following sub-groups;

1. San Diego Water Board’s findings are arbitrary,
2. Assumptions and data used,

3. Data analysis and presentation,
4. Cost versus benefit,
5. Alternate cleanup levels,
6. Constituent by constituent analysis, and
7. Benthic risk exposure

1. San Diego Water Board's Findings are Arbitrary  
ID 43

Coastkeeper and EHC commented that the Order's conclusion that cleanup to background water quality levels is economically infeasible, is arbitrary and capricious, and not supported by substantial evidence in the record.

The first step in determining appropriate cleanup levels—background or some other level—is assessing the technological and economic feasibility of cleaning to background pollutant levels. The Order determined that cleaning to background is technologically feasible. This means that the economic feasibility analysis determines whether alternative cleanup levels will be considered, and if so, what that level should be.

Because the economic feasibility analysis drives the entire cleanup, it is imperative that the economic feasibility is a fair analysis, supported with evidence in the record cited to its sources, which is fairly presented. But the economic feasibility analysis in Section 31 of the DTR fails to provide support for its assumptions, fails to provide the source of data used in the analysis, analyzes the cleanup arbitrarily in eleven groups of six polygons, presents the analysis in four arbitrary groups, and then arbitrarily proclaims that \$33 million is the cut-off for where the incremental costs exceed the incremental benefits.

This arbitrary and unsupported economic feasibility analysis leads to an arbitrary determination that cleanup to background is not economically feasible. More importantly, it has also lead to an arbitrary determination of what level of cleanup is the "best water quality reasonable" given all considerations.

ID 294, 295

In rebuttal, NASSCO commented that Resolution 92-49 defines the term "economic feasibility" as follows:

Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions. The evaluation of economic feasibility will include consideration of current, planned, or future land use, social, and economic impacts to the surrounding community including property owners other than the discharger. Economic feasibility, in this Policy, does not refer to the discharger's ability to finance the cleanup. Availability of financial resources should be considered in the establishment of reasonable compliance schedules.

Additionally, as discussed in the DTR, analyzing economic feasibility involves "estimating the costs to remediate constituents of concern at a site to background and the costs of implementing

other alternative remedial levels. An economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.”

NASSCO also commented that no other sediment sites in San Diego bay have been remediated to background. Moreover, EHC/Coastkeeper cannot point to a single sediment site in San Diego Bay that has been remediated to background levels; rather the consensus is clear, and the Regional Board’s Sediment Site Cleanup Team (“Cleanup Team”) admits, that cleanup to background is technologically and economically infeasible.

ID 421, 422

In rebuttal, BAE Systems commented that SDC and EHC correctly note that the Regional Board’s findings must be supported by the weight of the evidence in the record. Their position, however, that the Regional Board’s alternative cleanup levels are insufficiently protective, and the corresponding implication that cleanup to background on a constituent-by-constituent basis is technologically and economically feasible, are without merit. As set forth more fully below, the Regional Board has complied with the State Water Board Resolution No. 92-49 in setting alternative cleanup levels that do not unreasonably interfere with the beneficial uses of the water and are economically feasible.

Contrary to SDC and EHC’s position, the Regional Board and the other Designated Parties have complied with the State Water Board Resolution No. 92-49. As already noted, the law allows designated parties to remediate a site based on alternative cleanup levels, rather than to background, if the parties can demonstrate that it is economically infeasible to remediate a site to background. Not only do the TCAO and accompanying DTR demonstrate that it is economically infeasible to remediate the site to background, but two other experts, Arcadis, Inc. (“Arcadis”) and Integral Consulting, Inc. (“Integral”), have also so opined. Arcadia and Integral used different methodologies to assess cost-effectiveness than did the Regional Board but nonetheless each derived the same conclusion. Cleanup to background was not only substantially more expensive to achieve than cleaning to the DTR’s established cleanup levels, but also cleaning to background is substantially less cost-effective than cleaning to the DTR-established cleanup levels.

SDC and EHC argue that the alternative cleanup levels set forth in the TCAO and the DTR are not appropriately protective of the Bay’s beneficial uses. SDC and EHC submitted an analysis that primarily focuses on the efficacy of the alternative cleanup standards as opposed to analyzing whether achieving background sediment quality is economically feasible. It is only the latter question, whether cleanup to background is economically feasible, that must be answered in assessing whether the Designated Parties have appropriately met the terms of State Water Board Resolution No. 92-49.

## 2. Assumptions and Data Used

ID 45

Coastkeeper and EHC commented that the Regional Board's conclusions must be supported by substantial evidence in the record. However, the economic feasibility analysis is not supported by substantial evidence in the record. The key information, including cost assumptions, pollution

reduction assumptions, and dredging volume assumptions are either not provided or have been provided without a citation as to the source of the information. Failing to provide this information prevents the public from fully vetting the analysis and renders any Regional Board decision based on incomplete information or information not in the record arbitrary and capricious.

ID 47

Coastkeeper and EHC commented that the record fails to identify the source of the cost data in Table A31-1.

Table A31-1 contains cost data. The record fails to identify the source of data or itemize the costs so that the public can analyze the cost assumptions and the elements that underlie the cost conclusions.

Counsel for San Diego Coastkeeper and Environmental Health Coalition were provided an excel spreadsheet labeled "Economic Feasibility Source data" by counsel for the Cleanup Team on March 24, 2011. The document was provided without an administrative record citation and therefore it is assumed that this information is not currently a part of the administrative record. The file fails to indicate the source(s) for this economic feasibility data and this information has not been provided to the public.

This spreadsheet contains cost assumptions that are suspect. For example, the spreadsheet assumes that eelgrass mitigation will be required for five percent of the total dredging area for each six-polygon scenario. There is no showing that this is an appropriate assumption, nor is there any information about the source of the costs assumptions for "Eelgrass Habitat Mitigation" and "Eelgrass Land Lease Costs (in perpetuity)"/ Without this information, the public cannot evaluate the reliability of that data and assumptions.

ID 46

Coastkeeper and EHC commented that the economic feasibility analysis fails to identify the source of data for the surface weighted average concentration of the five priority pollutants. The source of the data, in Table A31 -1 column labeled "SWAC." DTR Appendix 31, has not been provided in the record. It must be provided to allow the public to evaluate the economic analysis and to perform additional analysis.

ID 49

Coastkeeper and EHC commented that there is no explanation in the economic feasibility analysis why polygons identified with a "depth to clean" as the undefined term "sur" have differing "dredging depth|s|."

Table A31-2 includes the undefined term "sur" for several polygons in the "depth to clean" column. Determining what the term "sur" is supposed to mean becomes challenging because the dredging depth varies for polygons with "depth to clean" listed as "sur." For example, "Depth to clean" for SW05 is "sur" while the "Dredging Depth" is 5; "Depth to clean" for SW23 is "sur" while the "Dredging Depth" is 3; and "Depth to clean" for NA15 is "sur" while the "Dredging Depth" is 7. The record provides no explanation as to why these three polygons that all have

"Depth to Clean" listed as "sur," have such varied dredging depths or how "Dredging Depth" was determined for rows where "Depth to Clean (ft)" is listed as "sur."

If "sur" means that only surficial data is available, the record must explain why additional sampling to determine appropriate dredging depth was not collected. Further, if dredging depth from polygons labeled "sur" was assumed based on dredging depth at an adjacent polygon, the record must explain how such an assumption could be valid and explain the consequences of that assumption to the cost assumptions.

ID 297

In rebuttal, NASSCO commented that the term "sur" indicates polygons in which only surface chemistry is available (i.e., from the upper 2 centimeters of sediment). In most cases, a 3-foot dredging depth was assumed, with an additional one-foot overdepth allowance, representing the minimum practicable thickness of dredging.

There are four exceptions to this assumption, involving cases where immediately adjacent polygons had better-defined depths to clean material. These cases are as follows: (1) the dredging depth at polygons SW13 and SW16 were assumed to be 5 feet because of their position adjacent to SW08 (dredged to 6 feet based on sediment core) and SW17 (dredged to 7 feet based on sediment core); (2) the dredging depth at polygon SW05 was assumed to be 5 feet because of its position adjacent to SW04 and SW02 (both dredged to 5 feet based on sediment cores); (3) the dredging depth at polygon NA15 was assumed to be 7 feet because of its position between NA09 (dredged to 9 feet based on sediment core) and NA17 (dredged to 5 feet based on sediment core).

ID 482

Coastkeeper and EHC commented that the DTR Contains Incorrect Statements. In performing the economic feasibility analysis, the Cleanup Team created a worst-to-least contaminated ranking of each of the 66 polygons in the Shipyard Sediment Site. The DTR claims that the ranking process "used Triad data and site-specific median effects quotient (SS-MEQ)." However, the Excel file used to create the worst-to-least contaminated ranking only includes the SS-MEQ and not Triad data.

ID 366

In rebuttal, NASSCO commented that the economic feasibility analysis relied on the composite SWAC ranking to determine remedial order, not the Triad data or SS-MEQ values.

### 3. Data Analysis and Presentation

ID 44

Coastkeeper and EHC commented that the economic feasibility analysis arbitrarily assessed costs in six-polygon groups. The DTR admits that the economic feasibility of remediating the Shipyard Sediment Site to background levels was assessed using a "series of cumulative cost scenarios, starting with the "six most contaminated stations, then adding the six next most contaminated stations, progressing sequentially down the list until the entire Shipyard Sediment Site was included in the scenario."



The DTR provides no explanation or rationale as to why stations were evaluated in groups of six. There is no biological or economic reason for the polygons to be evaluated in groups of six, particularly when the polygons are different sizes and six polygon groups do not necessarily represent one construction season or other grouping in which a consideration of economies of scale could have reduced costs.

Furthermore, by lumping the polygons together in groups of six, the analysis fails to provide the data to allow the Regional Board to determine that the alternative cleanup level should be set at a level that falls in between the groups of six polygons.

ID 294, 296

In rebuttal, NASSCO commented that cleanup levels below the proposed alternative cleanup levels are not justified given the favorable site conditions, and are economically infeasible regardless of whether the eleven cost scenarios are analyzed independently, or in groups of six.

As discussed in NASSCO's Initial Comments, the alternative cleanup levels are overly conservative, based on a series of excessively cautious assumptions concerning potential impacts to aquatic life, aquatic-dependent wildlife, and human health. The proposed economic feasibility analysis is similarly overly conservative, and requires cleanup well beyond the point at which the incremental benefits are justified by the incremental costs of further cleanup, considering that it has been demonstrated that monitored natural attenuation will ensure that the (excessively conservative) alternative cleanup levels are met within a reasonable time. Thus, any cleanup beyond the point identified in the DTR is similarly economically infeasible, given the favorable conditions observed at the Site. This is so regardless of whether cleanup scenarios are assessed independently, or in groups of six, as discussed below.

The economic feasibility analysis was a theoretical exercise designed for a single purpose – to provide an incremental cost-benefit analysis for the full spectrum of cleanup possible at the Shipyard Site, including cleanup to background conditions. Eleven scenarios were evaluated based upon the Cleanup Team's best professional judgment that eleven data points would be sufficient to establish a cost-benefit relationship. Additionally, the analysis required that each scenario represent a comparable incremental increase in the level of remedial effort necessary; thus, because 11 divides evenly into 66 (whereas 10 or 12 or 15 does not), using 11 data points facilitated assurance that each scenario represented a comparable incremental increase in level of effort. As described in the DTR, the Regional Board ordered all 66 polygons according to their composite SWAC ranking, which it determined was the best single metric for comparing relative Chemicals of Concern ("COC") levels. As described in the DTR, the sediment chemistry data used to calculate SWAC values for the economic feasibility analysis were the same data set used to assess all aspects of risk and beneficial use impairment at the Shipyard Site. Contrary to EHC/Coastkeeper's assertions, there are no "pollution reduction assumptions," other than the assumption that remediation areas under all scenarios will eventually equilibrate to background COC concentrations. Exposure reduction, as defined in the DTR, is simply the reduction in Sitewide SWAC that results from complete remediation of any specified area. It is an objective value, calculated mathematically from sediment chemistry data alone, and is not dependent on any given exposure scenario or assumptions. The exposure scenario evaluated in both the human

and aquatic-dependent wildlife risk assessments in the DTR are generally proportional to the Sitewide SWAC, therefore SWAC reduction is an appropriate metric for general conclusions about reduction of exposure and risk to human and wildlife receptors.

Each scenario was defined to be incrementally larger than the previous scenario by six polygons. Scenario 1 included the six most contaminated polygons (based on composite SWAC ranking), Scenario 2 included the 12 most contaminated polygons, Scenario 3 the 18 most contaminated polygons, etc. Scenario 11 included the entire Shipyard Site (66 polygons). This “worst first” approach provides a rational and direct manner in which to assess incremental net benefits of the full spectrum of potential cleanup effort.

ID 51, 52

Coastkeeper and EHC commented that the DTR Appendix 31 Table A31-2 groups the economic feasibility results together in an arbitrary manner. The economic feasibility analysis evaluated the 66 polygons in eleven "cost scenarios," with each scenario representing a group of 6 polygons. DTR Table A31-2 provided information relative to cost, such as total dredging area, total dredging volume, under pier area, and rock protection area for each polygon.

For each 6-polygon cost scenario, Table A31 -1 presented data for: (1) the resulting surface weighted average concentration of each pollutant following remediation of those polygons and (2) the cumulative percent exposure reduction for each pollutant. The economic feasibility analysis averaged the cumulative exposure reduction for all five pollutants and calculated the percentage "exposure reduction per \$10 million spent" based on the average pollutant levels. The DTR presents the data in a chart labeled Figure 31-1.

The graphic representation of the economic feasibility presented in DTR Figure 31-1 is arbitrary. Instead of graphing each of the eleven cost scenarios separately, the DTR grouped some of the scenarios together, presenting the data in the following way:

**Coastkeeper/EHC Table 1. Description of DTR Figure 31-1 by Cost Scenarios and Polygons<sup>1</sup>**

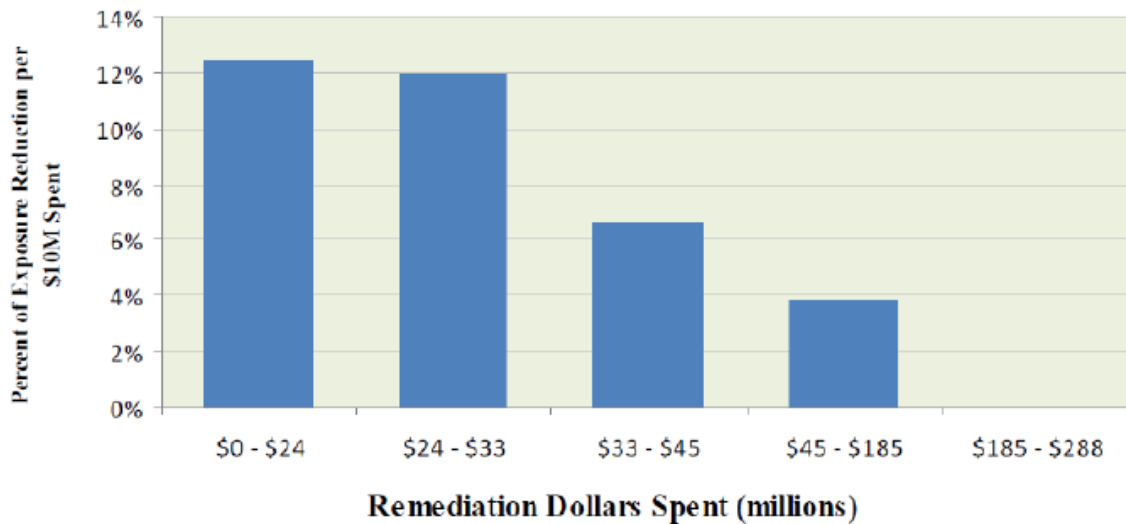
<b>“Remediation Dollars Spent” in Table 31-1</b>	<b>Cost Scenarios</b>	<b>Additional Polygons</b>	<b>Total Polygons</b>
<b>\$0 - \$24</b>	<b>1, 2</b>	<b>12</b>	<b>12</b>
<b>\$24 - \$33</b>	<b>3</b>	<b>6</b>	<b>18</b>
<b>\$33 - \$45</b>	<b>4</b>	<b>6</b>	<b>24</b>
<b>\$45 - \$185</b>	<b>5, 6, 7, 8, 9</b>	<b>30</b>	<b>54</b>
<b>\$185- \$288</b>	<b>10, 11</b>	<b>12</b>	<b>66</b>

By grouping multiple groups of six polygons scenarios together in an inconsistent and arbitrary way, the economic feasibility analysis fails to present a fair representation of the data, making the analysis arbitrary.

DTR Figure 31-1 would have looked different if results had been presented for each of the eleven cost scenarios.

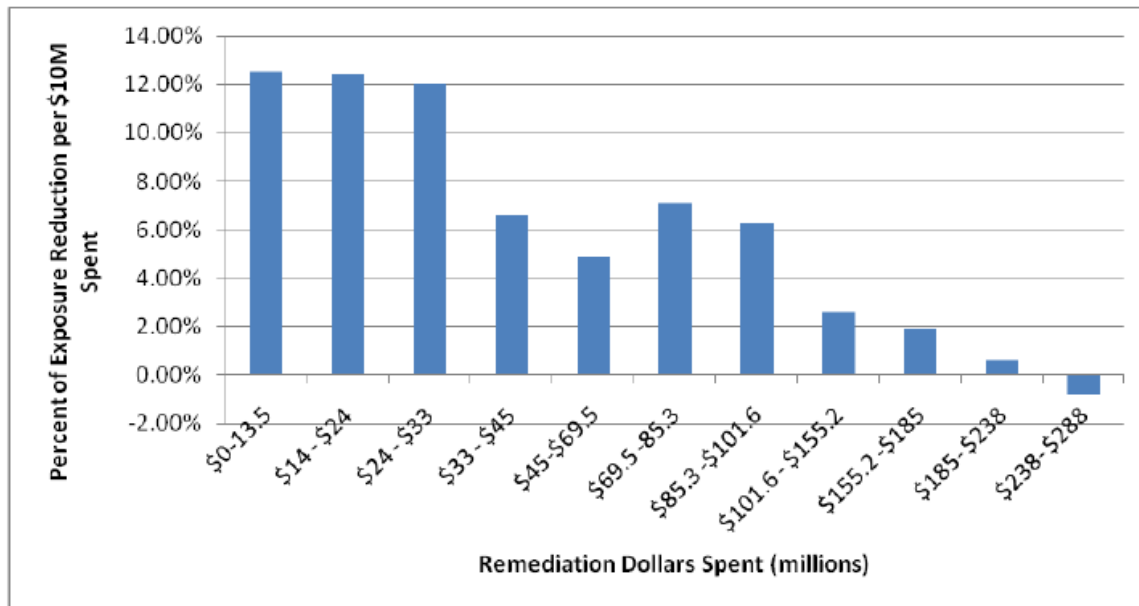
When the cost scenarios are arbitrarily grouped, they look like this:

**Figure 31-1 Percent Exposure Reduction versus Remediation Dollars Spent**



Note: See Appendix for Section 31 for supporting calculations

Each of the eleven cost scenarios graphed individually looks like this:



ID 294, 298

In rebuttal, NASSCO commented that Resolution No. 92-49 requires economic feasibility to be considered in setting appropriate cleanup levels, and requires the Regional Board to use best professional judgment in evaluating the point at which the incremental benefits of further cleanup are no longer justified by the incremental costs. Thus, selection of the point at which incremental benefits no longer justify incremental costs is primarily a policy decision, requiring best professional judgment, not a simple mathematical determination.

Here, however, regardless of whether the 11 hypothetical cost scenarios are grouped into five ranges or presented as 11 independent calculations, the underlying cost-benefit relationship is the same. In fact, EHC/Coastkeeper's Figure 1, which depicts the eleven cost scenarios graphed individually, illustrates the same trend that is apparent in DTR Figure 31-1, and lends credence to Regional Board's determination that cleanup to background is economically infeasible. Specifically, under both scenarios, the benefit per dollar spent is relatively high and flat for the first three scenarios, but decreases dramatically with the additional cleanup associated with scenario 4 (i.e., above \$33 million total cost), suggesting that cleanup above \$33 million total cost is not economically feasible, given the minimal incremental benefits. In fact, cleanup beyond the economically feasible point as defined in the DTR results in an exposure reduction of less than 7 percent per \$10 million spent after \$33 million; less than 4 percent after \$45 million; and zero at \$185 million. Exposure reductions of merely a few percentage points do not justify the expenditure of tens of millions of dollars, and would clearly violate Resolution 92-49's economic feasibility provisions.

Moreover, the Cleanup Team's analysis is based on chemical concentrations only. If the best measure of water quality is used (i.e., direct measurements of toxicity and benthic community analyses at NASSCO), then there is no incremental benefit of dredging any areas at NASSCO; thus, the economically feasible remedy is natural attenuation.

#### 4. Cost versus Benefit

##### ID 53

Coastkeeper and EHC commented that the DTR incorrectly summarizes cumulative exposure reduction percentages per \$10 million spent. The DTR states "exposure reduction drops below 7 percent per \$10 million after \$33 million, below 4 percent after \$45 million, and drops to zero at \$185 million." This response is consistent with supporting calculations in "2010-07-27 Economic feasibility 07-27-10.ng.xls" (SAR384569). But the Cleanup Team's own discovery response indicates that those numbers are incorrect and shows that the average exposure reduction per \$10 million is 10.8% after \$33 million, 8.7% after \$45 million, and at 5.5% at \$185 million. See Response to San Diego Coastkeeper and Environmental Health Coalition Economic Feasibility Question, attached as Exhibit D. [ Cleanup Team Response at Page 6: ]

Likewise, the DTR states that "the total cost of the cleanup is estimated to be \$58 million and asserts that "cleaning up additional areas beyond the proposed remedial footprint would yield about 4 percent additional exposure reduction per \$10 million spent." The Cleanup Team's own discovery response proves these statements to be incorrect, as the chart above illustrates that the cumulative exposure reduction per \$10 million for a \$69.4 million cleanup is actually 8.7%.

##### ID 300

In rebuttal, NASSCO commented that EHC/Coastkeeper argues that the cumulative exposure reduction calculations provided in the Cleanup Team's discovery response to EHC/Coastkeeper contradicts the assertion in the DTR that "exposure reduction drops below 7 percent per \$10 million after \$33 million, below 4 percent after \$45 million, and drops to zero at \$185 million."

DTR, at 32-40. However, in doing so, EHC/Coastkeeper blatantly ignores the distinction between incremental and cumulative costs and benefits.

Consistent with Resolution No. 92-49, Section 31.2 of the DTR clearly states that the economic feasibility analysis is based on a comparison of incremental costs and benefits, and the conclusion presented is also clearly labeled as having an incremental cost basis, not cumulative. This is appropriate given that an economic feasibility analysis conforming to Resolution No. 92-49 must determine the point at which additional remediation no longer produces an additional benefit that is sufficient to justify the associated additional expense of such remediation.

ID 423

In rebuttal, BAE Systems commented that Section 31 of the DTR sets forth the Regional Board's analysis of the economic feasibility of cleaning the site to background. On May 20, 2011, the Regional Board made clear in its answers to questions posed by SDC and EHC that "[t]he objective of section 31 [of the DTR] is to determine whether achieving background sediment quality is economically feasible – not what the cleanup levels will be." The Regional Board evaluated a number of criteria to determine risks, costs, and benefits associated with no action, cleanups to background sediment chemistry levels, and alternative cleanup levels greater than background concentrations. The criteria included factors such as total cost, volume of sediment dredged, the exposure pathway of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife and human health), effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources. The Regional Board then compared these cost criteria against the benefits gained by diminishing exposure to the primary COCs to estimate the incremental benefit gained from reducing exposure based on the incremental cost of doing so. This comparison revealed that the incremental benefit of cleanup diminishes significantly with additional costs beyond a certain cleanup level, and asymptotically approaches zero as remediation approaches background. Based on those considerations, the DTR concludes that cleaning up to background chemistry sediment levels is not economically feasible.

The Regional Board assessed economic feasibility by ranking the 65 shipyard sediment stations according to the contaminant levels found in surficial sediment samples. This process used Triad data and site-specific median effects quotient (SS-MEQ). The Regional Board then evaluated a series of cumulative cost scenarios by starting with the six most contaminated stations, then adding the six next-most contaminated stations, progressing sequentially down the list until the entire Shipyard Sediment Site was included in the scenario.

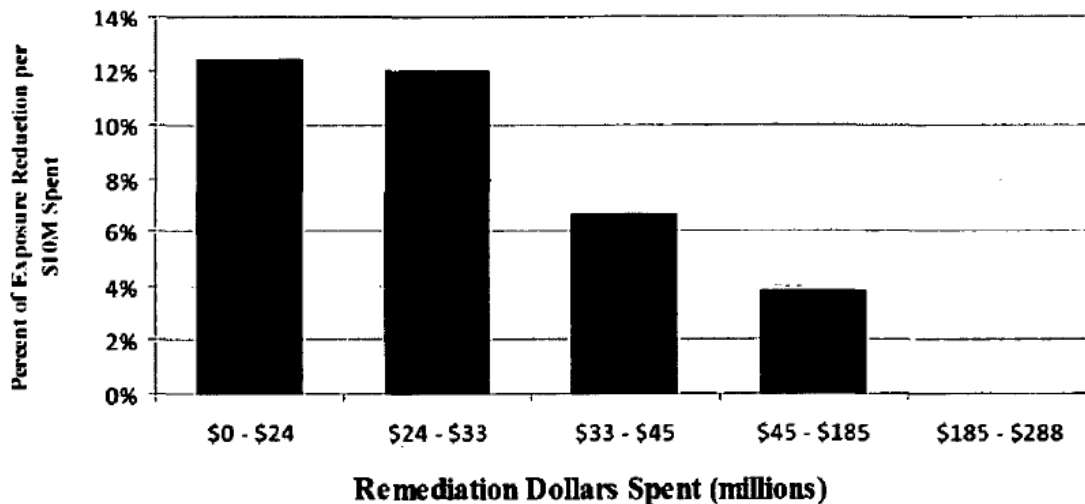
The following chart measures the incremental benefit from cleaning up various polygons, cleaning 66 polygons on a worst basis first. The benefit of remediating polygons is in exposure reduction per \$10 million of cost. The chart further measures the likely cost, per million dollars, to clean up the various polygons.

Table 1

Scenario	Number of Ranked Polygons	Incremental Probably Likely Cost per million	Cumulative Probable Likely Cost per million	Incremental Exposure Reduction per \$10 million*	Cumulative Exposure Reduction per \$10 million**
1	6	\$13.5	\$13.5	12.5%	12.5%
2	12	\$10.8	\$24.3	12.3%	12.4%
3	18	\$08.6	\$32.9	12.0%	12.3%
4	24	\$12.0	\$44.9	6.6%	10.8%
5	30	\$24.5	\$69.4	4.9%	8.7%
6	36	\$15.8	\$85.2	7.1%	8.4%
7	42	\$16.3	\$101.5	6.3%	8.1%
8	48	\$53.6	\$155.1	2.6%	6.2%
9	54	\$29.7	\$184.8	1.9%	5.5%
10	60	\$53.1	\$237.9	0.6%	4.4%
11	66	\$50.3	\$288.2	-0.8%	3.5%

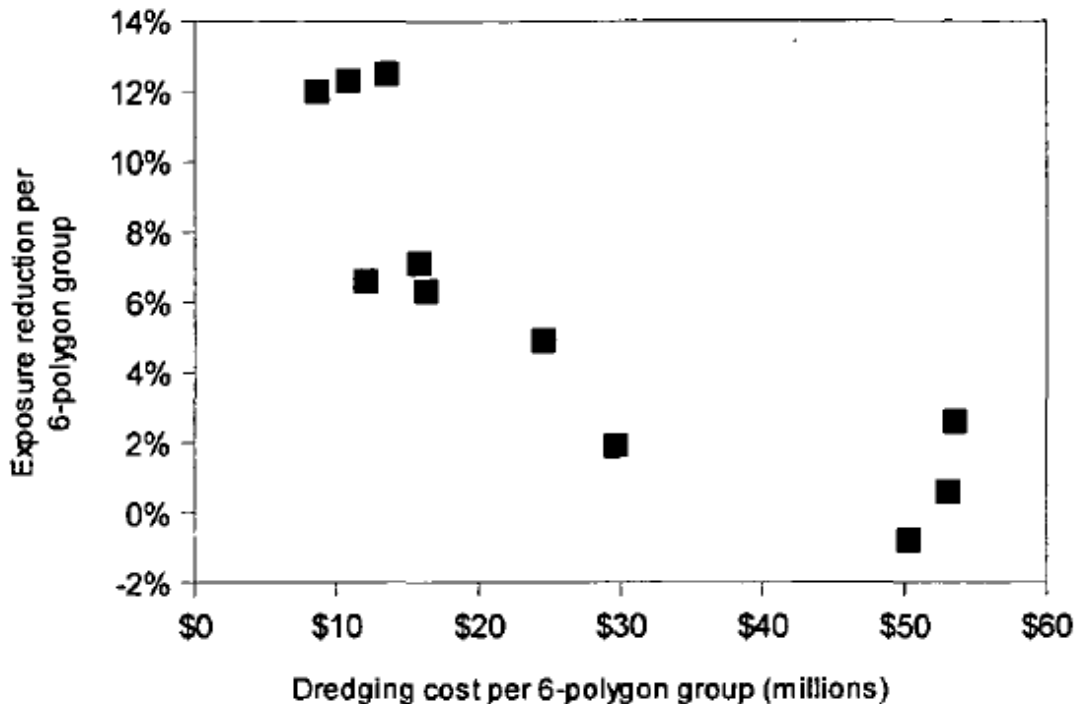
The Regional Board concluded that initial expenditures returned a relatively high exposure reduction benefit, but additional expenditures yield progressively lower returns per dollar spent on remediation. Figure 1, which is an accurate reflection of Figure 31-1 in the DTR, graphically demonstrates the percent exposure reduction versus remediation dollars spent.

**Figure 1 Percent Exposure Reduction versus Remediation Dollars Spent**



The highest net benefit per remedial dollar spent occurs for the first \$33,000,000 (18 polygons remediated), based on the fact that initial exposure reduction is above 12% per \$10,000,000 spent. Beyond \$33,000,000, however, the exposure reduction per dollar spent drops consistently as the cost of remediation increases. For cleanup to background, overall exposure reduction is only 3.5% per \$10,000,000 spent, and there is effectively no net exposure reduction for the last sets of polygons that would be included in such a remediation. Figure 2 illustrates the increasing costs and diminishing benefits associated with cleanup to background. Data shown in this figure are from Table 1.

**Figure 2**



The data table above shows the incremental and cumulative benefits and costs of conducting a sequential, “worst-first” cleanup of shipyard sediments. Remediation of the polygons with the highest chemical concentrations—those in the upper left of the figure—would yield not only the greatest exposure reduction (more than 12% for each set of polygons), but also the most cost-effective cleanup. Remediation of the polygons in the lower right of the figure, which would be the last addressed in a cleanup to background, would produce little or no exposure reduction, yet would be among the most costly to clean up. The marginal benefit of cleaning up to background is small or zero, whereas the marginal costs are the highest.

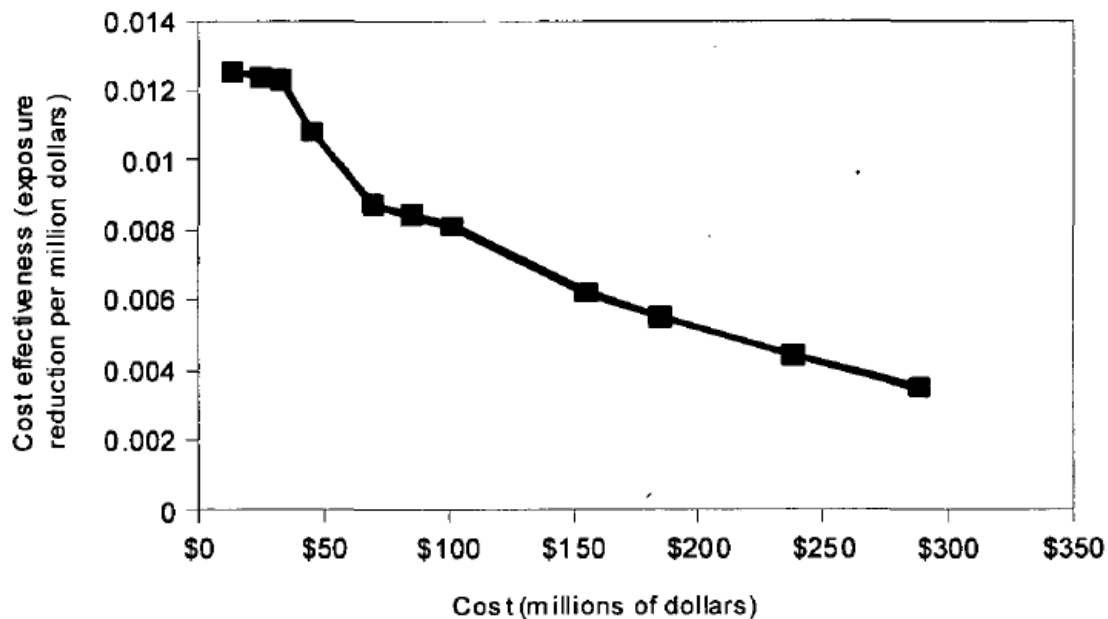
Further expenditures eventually reach a point where exposures reduction benefits become negligible. SDC and EHC assert that the Regional Board needs to identify the exact point where exposure reductions become negligible. The Regional Board is not so required. The objective of Finding 31 is merely to determine whether achieving background sediment quantity is economically feasible. It is sufficient to point where the incremental cost of achieving further reductions and contaminant concentrations exceed the incremental benefit of so doing.

In several of their comments, SDC and EHC claim that cleanup scenarios costing more than the remedial footprint identified in the DTR are, or may be, economically feasible. Included in these comments is the criticism that the grouping scenarios in Figure 31-1 of the DTR (Figure 1 above) have obscured the relationship between costs and benefits. These comments are based on a desire to analyze individual alternative cleanup levels rather than to address the essential

question before the Regional Board, whether achieving background sediment quality is economically feasible.

The Regional Board therefore correctly concluded that, based on the incremental costs versus incremental benefits, cleanup to background sediment quality levels is not economically feasible. In addition to evaluating incremental cost effectiveness, as illustrated in the preceding figure and discussion, the data in Table 1 can also be used to calculate the overall cost effectiveness of each scenario. Overall cost effectiveness refers to the total exposure reduction per million dollars spent for an entire cleanup scenario rather than for incremental areas of a cleanup. This measure of cost effectiveness can then be contrasted with the total cost of each different scenario as shown in the following figure.

**Figure 3**



Cost effectiveness, expressed as the fractional reduction in exposure per million dollars spent, is shown in the Y axis of Figure 3. Cost is shown on the X axis. The data points are those tabulated in the May 20, 2011 Response to San Diego Coastkeeper and Environmental Health Coalition’s Economic Feasibility Questions.

In this figure, the polygons at the upper left have the highest chemical concentrations, and thus are the most cost-effective to remediate. Cost effectiveness decreases steeply for more extensive remedial scenarios. Moving from left to right across this figure (i.e., to successively larger cleanup areas), a consistent drop in cost effectiveness is seen. This occurs even though the larger scenarios include the areas that are most cost-effective to remediate. As with the evaluation of incremental cost effectiveness, overall cost effectiveness drops most rapidly after the first three groups of polygons have been remediated. The decreasing cost-effectiveness with increasing costs is the basis of the Regional Board’s determination that cleanup to background is not cost effective. This is summarized in Section 32.7.1 of the DTR as follows: “The highest net benefit



per remedial dollar spent occurs for the first \$33,000,000.” After this point, the cost effectiveness of further dredging actions drops steeply. Cleanup scenarios costing more than approximately \$33,000,000 (which corresponds to the proposed remedy) are considerably less cost effective. Cleanup to background is only about one third as cost effective as the proposed remedy, at a cost that is almost ten times higher. The Regional Board’s determination that cleanup to background is not economically feasible relative to the proposed remedial footprint is well supported by the analysis of cost effectiveness.

ID 424

In rebuttal, BAE commented that additional economic feasibility analysis confirm cleaning to background is not economically feasible.

Arcadis and Integral undertook two additional economic feasibility analyses, and while they used slightly different methodologies, both concluded that a cleanup based on the DTR’s alternative cleanup standards was far more cost effective than cleaning to background.

Arcadis Evaluation.

Arcadis, in its March 11, 2011 Expert Report on Economic Feasibility Shipyard Settlement Site (“Arcadis Report”), presented cost and benefit information for three alternative cleanup scenarios: the DTR-recommended Option, cleanup to background (“Background Remedial Option”), and cleanup to a third alternative (“Alternative Remedial Option”). The Alternative remedial Option establishes alternative cleanup standards that are protective of designated beneficial uses by eliminating the shipyards as designated impaired waterways under the Clean Water Act. Arcadis applied an Office of Management and Budget cost-effectiveness guidance analysis in evaluating its three options. Arcadis’ analysis of the first two options is similar in approach to those used by the Regional Board in the DTR. The approach for implementing the Alternative Remedial Option is similar to the approach provided for the other two options, with the exception of exhibiting a reduced remedial footprint. Under the Alternative Remedial Option, 12 polygons will be targeted for remediation as compared to 23 polygons for the DTR-recommended Option and 66 for the Background Remedial Option.

As is allowed under State Water Board Resolution No. 92-49, Arcadis’ analysis included consideration of social costs, habitat impacts and business costs associated with the different cleanup options. Arcadis’ analysis of non-dredge related costs was premised on an assumption that a remediation project of this magnitude would necessarily generate social costs that the Regional Board did not factor into its economic feasibility analysis. Such costs include impacts on the community, habitat, and businesses. The magnitude and duration of these impacts is directly related to the size and duration of the selected remedial option. (Arcadis 2011.) Potential community impacts associated with remedial implementation include noise, increased traffic, air quality, and the potential for release of contaminants into the bay. The Alternative Remedial Option would have a little less than half of the trucks and mileage required for the DTR-recommended option and approximately 6% of the trucks and mileage required for the Background Remedial Option. The DTR-recommended option will require 12% of the trucks and mileage required for the Background Remedial Option. In short, the Background Remedial

Option would have a significantly larger impact on traffic than the other two options, leading to significantly greater risks of accidents and accident-related injuries. (Arcadis 2011.)

Dredging will resuspend contaminated sediment which will act to elevate the suspended solids and the concentration of contaminants in the water column. While remedial design will include measures to reduce the potential for suspension, resuspension cannot be eliminated completely. The potential for resuspension is a function of remedial method and quantity and will therefore be far greater for the Background Remedial Option than the other two remedial options. Furthermore, the Background Remedial Option would have the greatest potential for air emissions over the impact period of time.

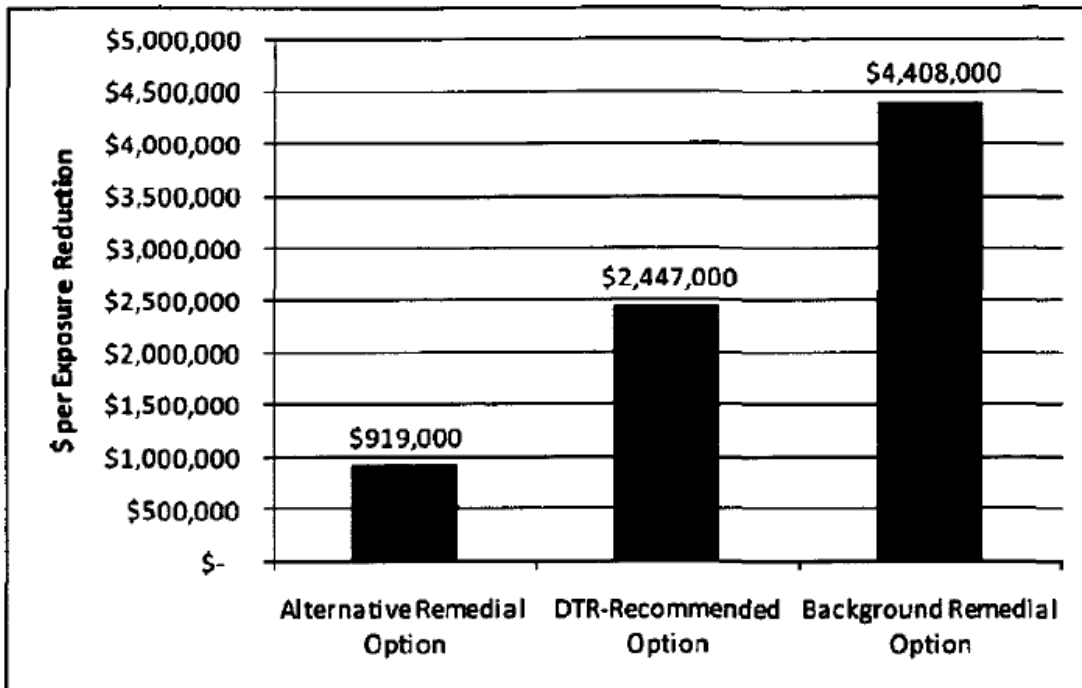
The three remedial options would have varying degrees of impact on the habitat. The Background Remedial Option may impact as much as 25% to 30% more eelgrass beds than the DTR-recommended Option. (Arcadis (2011) at 26.) Furthermore, dredging may have other habitat effects. For example, the increase in water depth may reduce the food available to diving ducks, such as the surf scoter.

Arcadis identifies many of the ways in which the Background Remedial Option, due to the length and breadth of remedial activity, will affect the shipyards. Because the shipyards at the Site are the only shipyards in California that are capable of providing both dry docking and pier-side berthing, interruptions and delays in ship construction/maintenance activities could affect the shipyard's ability to fulfill many contracts. Inabilities to fully utilize shipyard assets could have significant financial implications to the shipyards themselves, their employees, and the community's tax base. (See Arcadis (2011) at 27-28.)

Benefits were expressed in terms of proportional reduction in the surface area-weighted average concentration ("SWAC") relative to background—i.e., the same general approach as the DTR. Arcadis found that costs relative to benefits increased disproportionately for a cleanup to background when compared to the cleanup recommended in the DTR.

Figure 4 below, which is an accurate replication of Figure 5 in the Arcadis report, demonstrates the incremental costs and incremental reduction in exposure relative to background levels, measured in percent of the five primary COCs for the increasingly larger remedial footprints. The cost per exposure reduction (measured relative to background levels) increased from about \$900,000 under the Alternative Remedial Option (smallest remedial footprint) to about \$2,300,000 under the DTR-recommended Option. The incremental cost per exposure reduction under the Background Remedial Option increased to almost \$4,400,000 (using a 3% discount rate). The incremental cost per exposure reduction increases in cost by almost 100%, if a cleanup to background is commenced. The differential in cost per exposure reduction increases even more when social, habitat and business impacts are factored into the analysis.

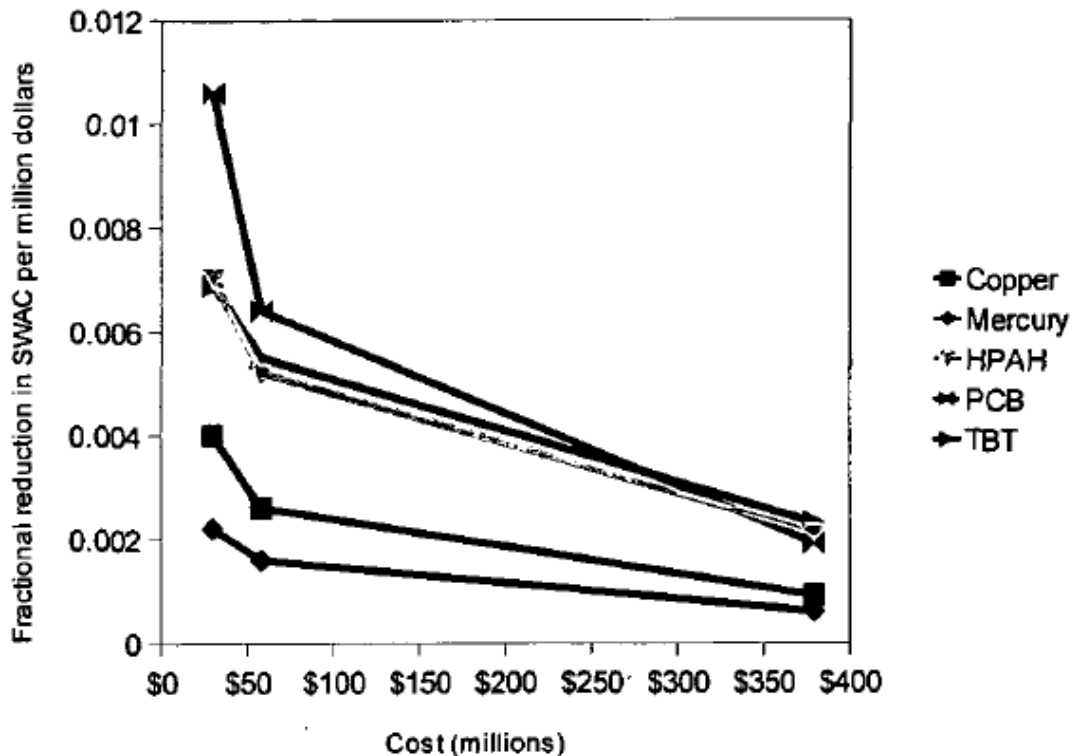
**Figure 4**



Integral Evaluation.

Integral, in its March 11, 2011 Evaluation of Alternative Cost Effectiveness Calculation Approaches for the Remedial Alternatives of the San Diego Shipyard Site, presented further analysis of these alternatives, including three different methods of assessing chemical-specific cost effectiveness. Integral calculated (in three different ways) the chemical-specific cost effectiveness for each of the primary COCs identified in the DTR. The fractional reduction in the SWAC per million dollars spent was used as the measure of effectiveness. Chemical specific cost-effectiveness for the three alternatives evaluated is illustrated in Figure 5 below, which is a replication of Table 3 in the Integral report. Three data points are shown in this figure for every chemical. These data points correspond to the three different remedial options evaluated: Arcadis' Alternative Remedial Option, the DTR-recommended Option, and cleanup to background, in order by increasing cost. In this figure the Y axis represents the cost effectiveness of each remedial alternative, expressed as the fractional reduction in SWAC per million dollars spent. The X axis is the cost for the three different remedial options. For each of the five COCs, the highest cost effectiveness is achieved with Arcadis' Alternative Remedial Option, moderate cost effectiveness is achieved with the DTR-recommended alternative, and the lowest cost effectiveness is associated with the cleanup to background.

**Figure 5**



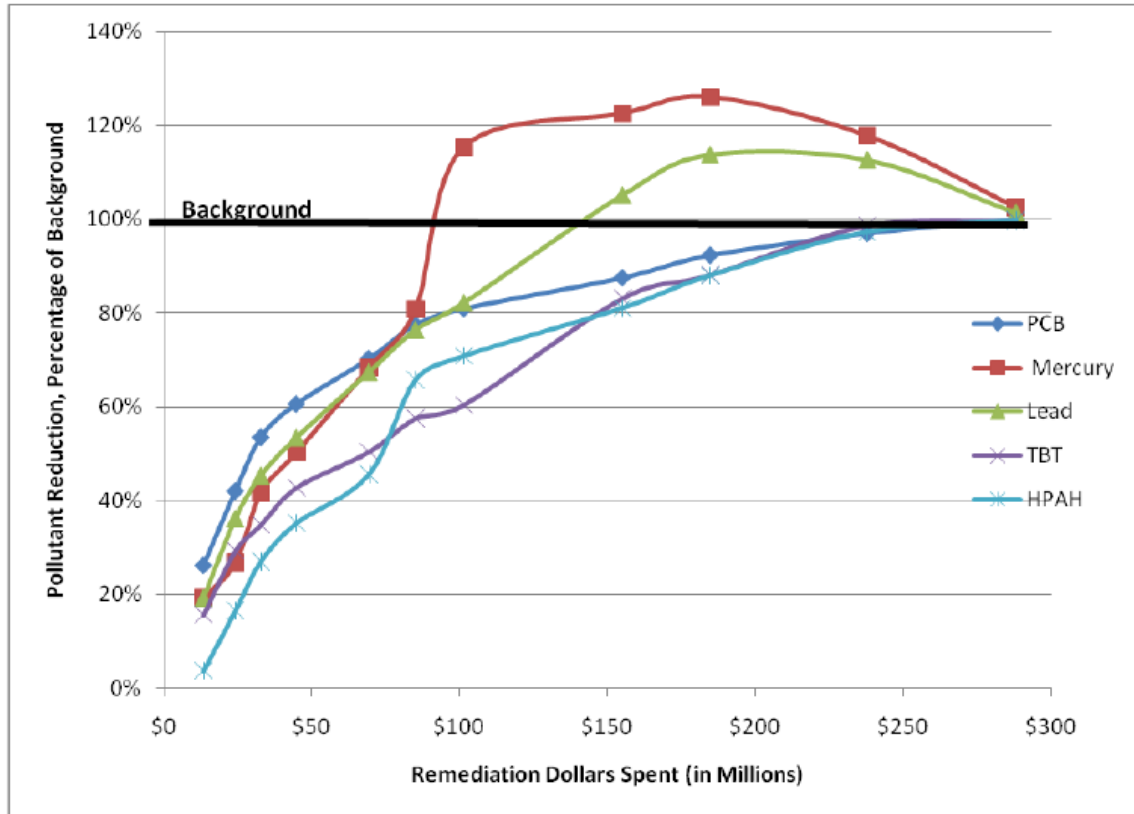
These results of chemical-specific cost effectiveness calculations show that the DTR-recommended Option is less cost-effective than Arcadis' Alternative Remedial Option, but is more cost effective than cleanup to background for all chemicals. This conclusion is consistent across all methods of interpreting cost effectiveness. Further, it is important to note that none of these methods of interpreting cost effectiveness account for the social costs, such as the impact to the community, habitat, and businesses that will be generated as a result of the cleanup level ultimately adopted by the Regional Board. Therefore, it is likely that the actual costs associated with each of the available options are understated, and the lack of cost effectiveness of cleaning to background is that much greater when all remediation costs, social and actual, are fully taken into account. Nevertheless, consistent with the determination in the DTR that cleanup to the proposed footprint is more economically feasible than cleanup to background, cleanup to the proposed footprint is more cost effective for each of the primary COCs at the Shipyard Site.

ID 55

Coastkeeper and EHC commented that the economic feasibility data was not presented in a scaled manner. DTR Figure 31-1 presents the economic feasibility analysis in a bar graph with percentage pollutant reduction per \$10 million spent on the Y-axis, and remediation dollars spent on the X-axis. But by using a bar graph, readers cannot tell the true relationship of the data points to one another over a continuous basis (dollars spent). To fairly represent the data and to observe the trends of where significant pollution reduction occurs per dollar spent and where the pollution reduction per dollar spent decreases, the results must be graphed on a continuous X-

axis. Once the data is plotted as a scatter graph on a continuous x-axis, we can truly see the percent reduction compared the remediation dollars spent.

**Coastkeeper/EHC Figure 3. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant and in Continuous Dollars, with Background Marked.**



ID 302

In rebuttal, NASSCO commented that the analysis presented in EHC/Coastkeeper Comments, Figure 3 differs only in form from that presented in EHC/Coastkeeper Comments, Figure 2. It contains no additional information, other than the inclusion of background as a reference point. Consistent with the bar chart, a slope change in the plotted figure (i.e., a decrease in benefit per unit cost) can be seen at approximately \$33 million total cost. The benefit/cost ratio generally continues to decrease with costs above this point.

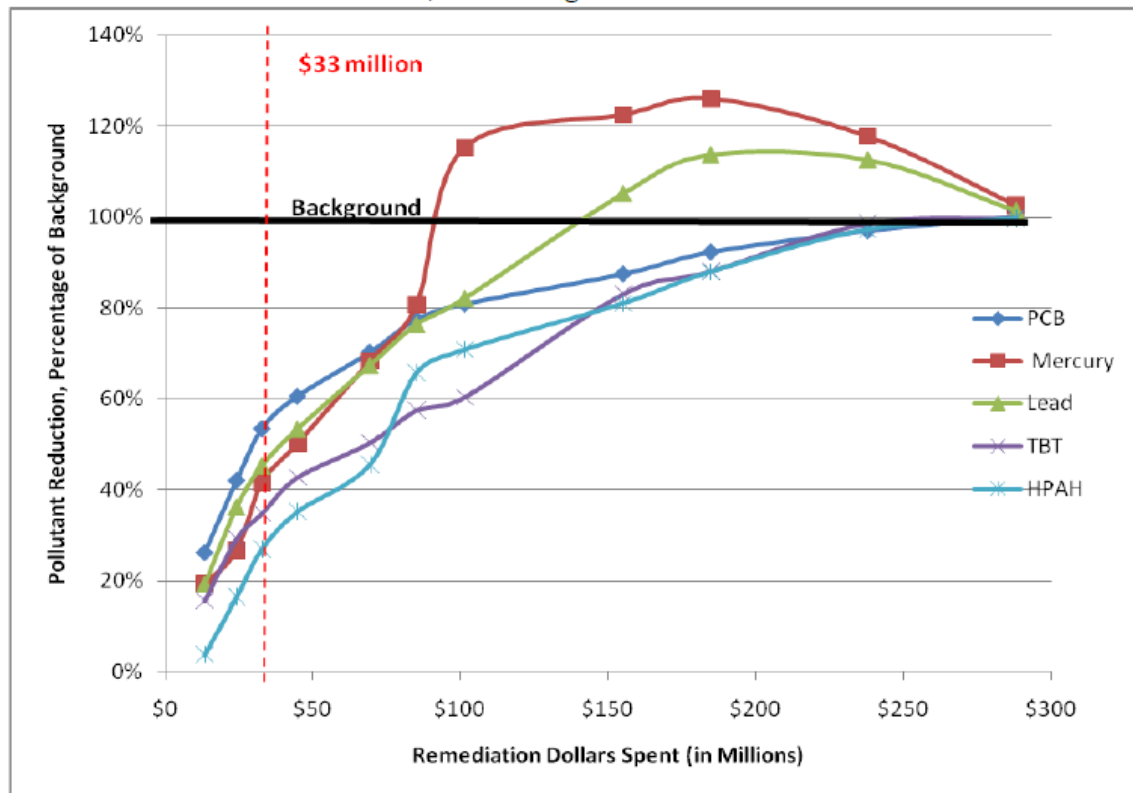
ID 56

Coastkeeper and EHC commented that the DTR's economic feasibility conclusions based on DTR Figure 31-1 are arbitrary and capricious. The highest net benefit per remedial dollar spent occurs for the first \$33 million (18 polygons), based on the fact that initial exposure reduction is above 12 percent per \$10 million spent. Beyond \$33 million, however, exposure reduction drops consistently as the cost of remediation increases. Exposure reduction drops below 7 percent per \$10 million spent after \$33 million and below 4 percent after \$45 million. Based on these incremental costs versus incremental benefit comparisons, cleanup to background sediment quality levels is not economically feasible.

These conclusions are not supported by evidence in the record once the exposure reduction per \$10 million is analyzed and presented on a constituent-by-constituent basis. It is crucial that the exposure reduction data for each pollutant be graphed individually because the alternative cleanup levels must be set on a pollutant-by-pollutant basis, not as an average pollution reduction amount. The alternative cleanup levels address each pollutant separately because each pollutant represents a different major class of pollutants that poses a specific type of harm or risk of harm to human health or the environment.

If the economic feasibility results are examined on a continuous dollar basis and on a constituent-by-constituent basis, it becomes clear that selection of \$33 million as the point below which exposure reduction "drops consistently" as the remediation cost increases and conclusion that cleanup to background is economically infeasible is arbitrary and capricious.

**Coastkeeper/EHC Figure 4. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant and in Constant Dollars, with background and \$33 million marked.**



ID 294, 303

In rebuttal, NASSCO commented that the record is clear that cleanup to background is economically infeasible. EHC/Coastkeeper erroneously states that the record does not support a finding that cleanup to background is economically infeasible. Under Resolution 92-49, determining economic feasibility requires an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions. Further, Resolution 92-49 explicitly provides that “[e]conomic feasibility . . . does not refer to the discharger’s ability to finance cleanup;”

rather, an economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.

The DTR analysis compared incremental benefits of further cleanup, expressed in terms of exposure reduction to target receptors, with the incremental cost of achieving those benefits, and determined that the degree of exposure reduction does not justify the incremental cost of such reductions, beyond approximately \$33 million. This analysis is consistent with the requirements of Resolution 92-49, and is supported by evidence in the record. Moreover, as discussed above, due to the generally favorable site conditions, any active remediation is economically infeasible under the terms set forth in Resolution 92-49. In fact, it is well-known that cleanup of sediment to background levels in San Diego Bay is economically infeasible: to date, because of economic infeasibility, none of the sediment site in San Diego Bay have been remediated to background conditions. Cleanup Team's Responses and Objections To Designated Party BAE's First Set Of Requests for Admission, Admission Nos. 44 – 46 (admitting that it is economically and technologically infeasible to remediate the Site to background, and that the Regional Board has never required remediation to background sediment quality levels for any other site within the San Diego Bay).

The record contains no evidence that cleanup to background is economically feasible; in fact, EHC/Coastkeeper has not even provided evidence that cleanup to the alternative cleanup levels is economically feasible, let alone evidence supporting its position that cleanup to background levels is feasible.

NASSCO also commented that the alternative cleanup levels were selected based on an overly conservative interpretation of chemistry and biological data, not economic feasibility. EHC/Coastkeeper erroneously states that the economic feasibility analysis was the primary basis for the selection of the alternative cleanup levels; however, this is a patently false statement. The selection of alternative cleanup levels was based on the Regional Board's analyses of many factors, including ), including individual station and Sitewide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility. Further, based on these criteria, the selected cleanup levels are excessively conservative, as discussed extensively in NASSCO's Initial Comments.

Thus, contrary to EHC/Coastkeeper's assertions, the economic feasibility analysis was not intended to select a specific remedial scenario, and was not the primary basis for selection of any specific scenario. Rather, the analysis was intended to determine whether a point of diminishing returns on invested resources was apparent in the cost-benefit relationship, and then identify the most cost-effective level of effort—assuming that areas of higher contamination were preferentially selected for removal (as is typical). Accordingly, EHC/Coastkeeper's statement that "the economic feasibility analysis drives the entire cleanup" is incorrect. In actuality, the final selection of a remedial footprint in the DTR was based on simultaneous consideration of many factors (as is legally required under Resolution 92-49), including individual station and Sitewide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic

feasibility. In fact, considering the results of these analyses, the proposed cleanup is extremely conservative, as discussed in NASSCO's Initial Comments.

EHC/Coastkeeper's assertion that "the economic feasibility analysis in Section 31 determined the alternative cleanup levels" is a mischaracterization of the analysis in the DTR, which contains highly conservative analyses of individual station and Sitewide chemistry data, biological data (including toxicity tests, benthic community analysis, and SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility.

#### ID 110

Coastkeeper and EHC commented that the Regional Board should make an independent finding of what level of cleanup is economically feasible based on all the evidence in the record regarding economic feasibility. The economic feasibility analysis presented in DTR § 31 fails to present the results of the analysis in a manner that allows that Regional Board to make a reasoned decision regarding what level of cleanup is economically feasible. Once the results are presented on pollutant-by-pollutant basis and along a continuous "dollars spent" x-axis, it becomes clear that \$33 million is not a reasonable cut-off for what cleanup is economically feasible "considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." See State Water Board Order 92-49. Therefore, economic feasibility conclusions based solely or heavily on analysis in DTR § 31 are arbitrary and capricious.

The Regional Board should independently evaluate the economic feasibility analysis and determine at what point, if any, benefits of additional remediation become "negligible" and above which no further remediation should be required. We urge the Regional Board to set this level well above the \$33 million level set in DTR § 31 and that forms the basis for setting the Alternative Cleanup Levels. See DTR §32.2 at 32-12 ("An assessment of risk to wildlife receptors under projected post-remedial conditions was conducted to confirm the alternative cleanup levels established by economic analysis (Section 31) are adequately protective of aquatic-dependent wildlife beneficial uses." (emphasis added)).

#### Comment ID 370

In rebuttal, NASSCO commented that EHC/Coastkeeper argue that the economic feasibility analysis presented in the DTR is flawed, and suggests that the Regional Board should "independently evaluate the economic feasibility analysis and determine at what point, if any, benefits of additional remediation become 'negligible' and above which no further remediation should be required." As discussed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 5 through 18, the economic feasibility analysis in the DTR is overly conservative. Thus the Regional Board has already "independently evaluate[d] the economic feasibility analysis and determine[d] at what point, if any, benefits of additional remediation become 'negligible' and above which no further remediation should be required."

Further, EHC/Coastkeeper, without any credible basis or economic feasibility analysis of its own, "urge[s] the Regional Board to set this level well above the \$33 million level set in DTR § 31." The Regional Board should decline to replace the present analysis, based on the unsupported urgings of EHC/Coastkeeper. To the extent that the Regional Board does revise its



economic feasibility analysis, applying Resolution 92-49, the Regional Board should reach the conclusion that only monitored natural attenuation is feasible, in light of the minimal benefits of active remediation as discussed in the Exponent Report, and the Cleanup Team's admissions that, under Resolution 92-49, the Regional Board could decide that no further cleanup is required if there is no benefit to an incremental cleanup measure. Moreover, one member of the Cleanup Team has admitted that, based on his 20-plus years of experience doing cost estimates and then going out and implementing remediation, the actual cost of remediation often exceeds pre-remediation estimates by as much as an order of magnitude, providing further evidence that the true point at which the incremental benefit is no longer justified by the incremental cost has already been exceeded under the DTR's economic feasibility analysis in the DTR. Thus, the TCAO and DTR analyses are already overly conservative, both in terms of protection of beneficial uses and the feasibility analyses; accordingly, no further cleanup is warranted.

ID 435

In rebuttal, BAE Systems commented that SDC and EHC draw numerous conclusions in this section that are invalid. The purpose of the economic feasibility analysis, as stated by the Regional Board's Cleanup Team is solely to determine whether cleanup to background is economically feasible. The Cleanup Team has determined that cleanup to background is not economically feasible, and that the proposed footprint is economically feasible, based on the cost-effectiveness of different cleanup scenarios. The stated purpose of the economic feasibility analysis does not include or imply any requirement to evaluate the economic feasibility of all, or any, other cleanup scenarios that may be favored by SDC/EHC.

## 5. Alternative Cleanup Levels

ID 44

In the "Data Analysis and Presentation" comments, Coastkeeper and EHC also commented that by lumping the polygons together in groups of six, the analysis fails to provide the data to allow the Regional Board to determine that the alternative cleanup level should be set at a level that falls in between the groups of six polygons.

ID 57

Coastkeeper and EHC commented that the conclusion that the alternative cleanup levels are the lowest levels economically achievable is arbitrary and capricious and not supported by the evidence. The Order concludes that "the alternative cleanup levels established for the Shipyard Sediment Site are the lowest levels that are technologically and economically achievable." But this conclusion is based on the DTR's faulty analysis in § 32.7.1 regarding the four percent additional exposure reduction per additional \$10 million spent above \$58 million, which the Cleanup team's own discovery response has proven untrue.

Further, the DTR's conclusion that 4 percent additional average pollutant exposure reduction per \$10 million spent is not "economically achievable," is arbitrary. Neither the Order nor the DTR explains why a 12% average exposure reduction per \$10 million is economically achievable, but 4% average exposure reduction per \$10 million is not. Nor has the Order or DTR explained why it is appropriate to look at average exposure reduction for all pollutants instead of analyzing economic feasibility on a pollutant-by-pollutant basis. If economic feasibility is analyzed for

each pollutant, a cleanup of \$85 million provides an exposure reduction for HPAHs of approximately 12% per \$10 million, and a cleanup of \$101 million provides an exposure reduction for mercury over 20% per \$10 million spent. Determining that a \$58 million cleanup will bring pollutant levels to the "lowest levels economically achievable" based on a faulty claim that further cleanup will only reduce pollution by 4% per \$10 million spent is arbitrary and capricious when the evidence shows that additional cleanup will reduce HPAHs by 12% per \$10 million spent and reduce mercury by 20% per \$10 million spent.

ID 294, 295, 304

In rebuttal, NASSCO cited its previous rebuttal comments in this group. NASSCO also commented that within the meaning of Resolution 92-49, "economically achievable" and "economically feasible" are specific terms of art referring to the requirement that the Regional Board engage in "an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions." Resolution 92-49 explicitly states that these terms "do not refer to the dischargers' ability to finance the cleanup."

As discussed above, applying Resolution 92-49, there is ample evidence in the record demonstrating that cleanup to background is economically infeasible, and the alternative cleanup levels are overly-conservative and economically infeasible. EHC/Coastkeeper has cited no evidence in the record to support the contention that lower cleanup levels are economically feasible.

ID 58

Coastkeeper and EHC commented that the economic feasibility analysis fails to demonstrate that the chosen alternative cleanup levels represent the "best water quality" based on all demands. The DTR states: "An assessment of risk to wildlife receptors under projected post-remedial conditions was conducted to confirm the alternative cleanup levels established by economic analysis (Section 31) are adequately protective of aquatic-dependent wildlife beneficial uses." . In this statement, the DTR admits that the economic feasibility analysis in Section 31 determined the alternative cleanup levels. But there is no evidence in the record justifying the decision to limit the Proposed Remedial Footprint to 23 polygons.

State Water Board Order 92-49 requires the economic feasibility analysis to consider all the values involved, but the economic feasibility analysis only includes cleanup cost for the dischargers and measures that against average pollutant concentration removal per \$10 million spent. The analysis fails to quantify and consider additional benefits to human health, wildlife, aquatic dependent wildlife, and other beneficial uses from removing pollutants and providing a cleaner San Diego Bay for the wildlife and communities that use this resource. The analysis vaguely asserts that it "considered" a broad range of values, but none of these are listed or quantified, and there is no explanation of the role these other, external costs played in the determination of the economic feasibility of cleaning to background.

For example, the DTR claims that the "San Diego Water Board evaluated a number of criteria to determine risks, costs and benefits." It suggests that these criteria included factors such as "total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and

long-term effects on beneficial uses..., effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial or industrial uses of aquatic resources." But other than alleging that these factors were "evaluated," the DTR makes no attempt to quantify or rank these criteria or explain how they were balanced against one another.

ID 294, 305

In rebuttal, NASSCO commented that the DTR conservatively estimated the costs of cleanup to alternative cleanup levels. The DTR states that criteria including "total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife, and human health), effects on the shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources." EHC/Coastkeeper suggests that "benefits to human health, wildlife, aquatic-dependent wildlife, and other beneficial uses from removing pollutants" were not "quantified"; however, the economic feasibility analysis does quantify benefits in terms of exposure reduction. Further, using reasonable assumptions, such a quantification would not justify any active remediation. Extensive scientific investigation conducted at the shipyards, including the sediment quality investigation upon which the findings and conclusions of the TCAO are purportedly based, indicates that beneficial uses at the site are not unreasonably impaired and that active remediation would "result in improvements that are minimal—on the order of only a percent or so."

Yet, active remediation, including the remediation described in the TCAO, would destroy existing mature and thriving benthic communities at the Site, and result in significant negative impacts to NASSCO and the surrounding community, including but not limited to (1) the potential to jeopardize the integrity of slopes and structures at the leasehold, (2) disruption of vital ship repair and construction activities that could result in delays or contractual breaches with the U.S. Navy and other customers, (3) increased truck traffic, (4) diesel emissions from trucks and heavy equipment, (5) noise, (6) accident risks, (7) transportation of large volumes of contaminated sediment through neighborhoods, and (8) the need to establish large staging areas for dewatering activities. Taking all of these factors into account suggests that the alternate cleanup levels are not economically feasible, and certainly do not weigh in favor of further cleanup.

## 6. Constituent by Constituent Analysis

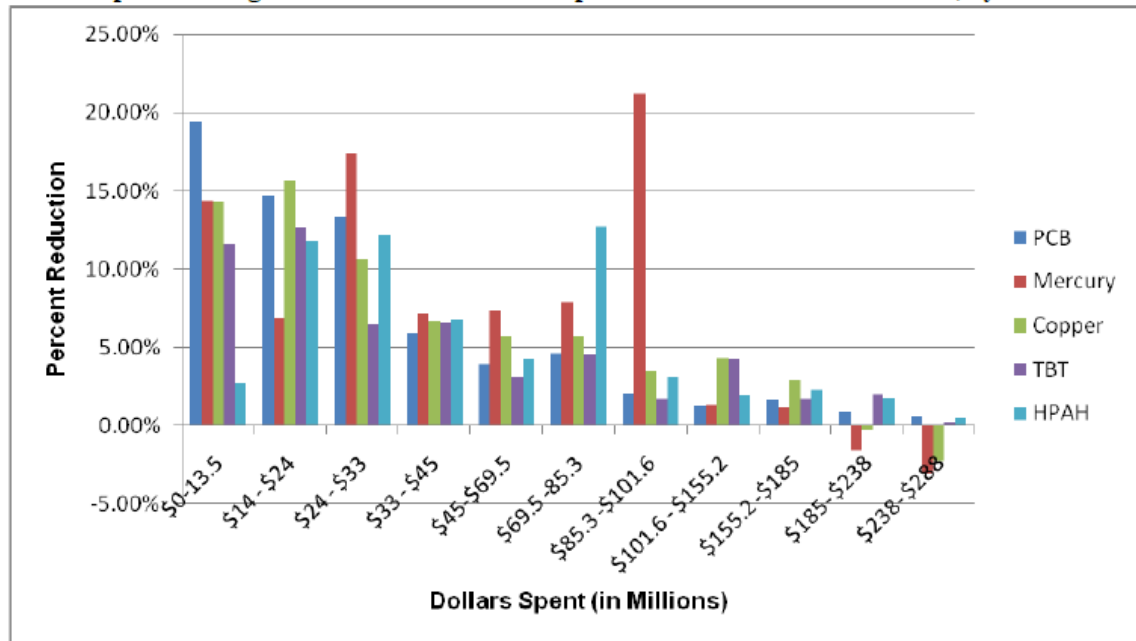
ID 54

Coastkeeper and EHC commented that the economic feasibility was not determined on a constituent-by-constituent basis. The economic feasibility analysis fails to calculate or present the data on a pollutant-by-pollutant basis. But the law requires that economic feasibility be determined on a pollutant-by-pollutant basis. (The Regional Board must determine technological and economic feasibility "to achieve the background value for that constituent and find that " the constituent will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded."

By averaging the pollutant reduction concentration for all five primary constituents of concern, the Cleanup Team and DTR have masked variability in pollutant exposure reduction for each of the pollutants. For example, when percent pollution exposure reduction is calculated for each pollutant individually, it becomes clear that cost scenario 7 (\$85.3 - \$101.6 million) results in more than 20% exposure reduction in mercury, a persistent bioaccumulating pollutant with significant health impacts.

Calculating and graphing the percent pollution exposure reduction per \$10 million spent for each pollutant, using the same methodology the Cleanup Team used in the DTR. The result looks like this:

**Coastkeeper/EHC Figure 2. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant**



ID 301

In rebuttal, NASSCO commented that EHC/Coastkeeper’s proposed constituent-by-constituent economic feasibility analysis is not required by Resolution 92-49, and is technically invalid. As discussed in NASSCO’s Response (Comment ID 291) to EHC/Coastkeeper Comment ID 39, there is no requirement in Resolution 92-49 that requires a constituent-by-constituent economic feasibility analysis. Moreover, EHC/Coastkeeper’s proposed constituent-by-constituent economic feasibility analysis is not scientifically valid.

EHC/Coastkeeper asserts that averaging the pollutant reduction concentration for the five primary COCs, as was done in the DTR masks variability in pollutant exposure reduction for individual pollutants, and suggests that, when pollutants are analyzed individually, progression from cost scenario 6 (\$69.5 million-\$85.3 million) to cost scenario 7 (\$85-\$101.6 million) results in “more than 20% exposure reduction in mercury.” However, EHC/Coastkeeper’s proposed constituent-by-constituent reanalysis of the economic feasibility data merely illustrates that the five COCs are not identically distributed across the site, without addressing the issue of net

remedial cost-benefit. It also confirms that incremental benefits generally decrease with increasing cost.

Of particular concern, EHC/Coastkeeper's proposed reanalysis also obfuscates the net benefits, leading to absurd results and illustrating why this analysis is a poor standalone basis for selecting a remedy (something it was never intended to do). Specifically, EHC/Coastkeeper's proposed analysis fails to recognize that the mercury SWAC achieved in scenario 7 is actually well below the site-specific reference concentration (i.e., background UPL) for mercury. Under current conditions, the mercury SWAC at the shipyard is not highly elevated relative to background (only 1.2x background UPL prior to any remediation), and very quickly approaches background as the highest composite SWAC polygons are remediated. Accordingly, at scenario 6, mercury is essentially at background. Under scenarios 7 to 11, the mercury SWAC is predicted to be below background, because the remaining unremediated stations all have mercury concentrations below the background UPL (see Figure 1, below). Scenarios 9 and 10 actually predict a rise in mercury SWAC with continued remediation, because areas with mercury levels below background are being dredged and the dredged area is assumed to equilibrate to the higher background level after remediation. As a result, the apparent "reduction" in mercury exposure from scenario 6 to scenario 7 actually produces no benefit to the public relative to the reference condition (defined as 100% exposure reduction), at a cost of more than \$16 million.

## 7. Benthic Risk Exposure

ID 95, 96, 97, 98

SDG&E commented that section 31 economic feasibility analysis fails to consider costs to 'reduction in benthic risk exposure' and should be revised. SDG&E also commented that economic feasibility refers to the objective balancing of the incremental benefit of attaining more stringent cleanup levels compared with the incremental cost of achieving those levels. The CRWQCB (2010) is required by Resolution No. 92-49 (SWRCB, 1996) to evaluate economic feasibility such that the benefits of remediation in addressing the Site's BUIs are fully understood. The CRWQCB (2010) evaluated the benefits of remediation as the reduction in chemical exposure to human and aquatic-dependent wildlife receptors using surface-area weighted average concentrations (SWAC) of Site COCs. While this approach satisfies Resolution No. 92-49 with respect to Human Health and Aquatic-dependent Wildlife BUIs, it does not address Aquatic Life BUI.

Figure 31-1 of CRWQCB (2010) represents the final product of an economic feasibility analysis conducted to compare the incremental reduction in chemical exposure (y-axis of figure) to incremental remedial costs (x-axis of figure). In this figure, as explained on Page 31-2, exposure reduction is calculated on the basis of SWACs for the various remedial increments. The proposed remedial footprint set forth in Section 33 of the DTR was explicitly derived to address all three potential Site BUIs. SWACs were used to evaluate only two of the three BUIs found at the Site: Human Health and Aquatic-dependent Wildlife (Section 32.2 in CRWQCB (2010)). Aquatic Life BUI was evaluated on the basis of Triad and Non-Triad Data Approaches, not SWACs (Section 32.5 in CRWQCB (2010)). Although Page 31-2 states that "[t]his process used Triad data and site-specific median effects quotient (SS-MEQ)" (in reference to the economic feasibility analysis), the metric used to evaluate remedial success (exposure reduction) does not

include a quantification of the exposure reduction gained from remediating polygons exhibiting Aquatic Life BUI. The areas of the polygons affected by aquatic life BUI are not included in the calculation of exposure reduction, as shown on Page 31-2 and in the Appendix 31 supporting material. The economic feasibility analysis by Spadaro et al. (2011, Table 15 therein) is also flawed because it only considers SWACs, which do not account for Aquatic Life BUI.

SDG&E also commented that because the CRWQCB is charged with addressing all three BUIs, and any supporting economic feasibility analysis, it is imperative to evaluate economic feasibility on the basis of all three BUIs. A revised economic feasibility analysis is shown in Figure 2, based on calculations shown in Tables 20 and 21. In this revised economic feasibility analysis, the percent exposure reduction for all three BUIs is considered via calculation of a composite percent exposure reduction based on SWACs for aquatic-dependent wildlife and human health (as in CRWQCB (2011)) and the area exhibiting aquatic life BUI, as based on a Toxic Unit approach for the sediment chemistry line of evidence (Figure 3; Conder, 2011a). The Toxic Unit approach is a causal chemical exposure modeling to account for bioavailability of chemicals to benthic invertebrates and predict potential chemical risk. It was used as a replacement approach for the flawed SQGQ1 approach used in the CRWQCB (2010) Triad sediment chemistry line of evidence in order to re-classify Triad stations. It was also used as a replacement approach for the flawed SS-MEQ and 60% of the LAET calculations used in the Non-Triad Data Approach. Both the revised Triad and Non-Triad Data approaches were used to identify polygons for Aquatic Life BUI (Figure 3).

Economic feasibility was also calculated using a footprint designated to address Aquatic Life BUI only (Figure 4). The approach ranked polygons exhibiting Aquatic Life BUI by the highest Toxic Unit result multiplied by the area of the polygon (Table 22). Remedial cost was estimated for five increments according to approximate cost rates suggested by Table A31-1 (Table 23). This approach is more technically defensible because Aquatic Life BUI is the most likely BUI exhibited at the Site and modeling of human health and ecological risk to aquatic-dependent wildlife is flawed.

SDG&E also commented that a revised economic feasibility approach should be adopted by CRWQCB to enable a complete and accurate evaluation of economic feasibility for any proposed remedial footprint for the protection of BUIs at the Site.

#### ID 388

In rebuttal, NASSCO commented that SDG&E's comment correctly notes that the DTR economic feasibility analysis measured benefit based on exposure reduction for receptors that average exposure over the entire site. However, it must be noted that benefits to the benthic community must be assessed on a point by point basis, and cannot be represented by an area weighted average concentration metric. The remedy proposed in the DTR directly addressed all areas identified as likely to impact aquatic life due to sediment contamination. No areas of likely benthic impacts were omitted from the DTR remediation footprint due to economic feasibility concerns.

### **Response 31-1**

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All of the comments and rebuttal attempt to describe the requirements of Resolution No. 92-49 with respect to economic feasibility of cleaning up to background and establishing the lowest alternative cleanup levels that are economically achievable. However, the commentors fail to note that the latter consideration – establishing the lowest alternative cleanup levels that are economically achievable - is not a mandatory directive, but rather, one of the factors to be considered in setting alternative cleanup levels under Resolution No. 92-49. The factor is set forth in section 2550.4(c) of Title 23 of the California Code of Regulations, and only need be applied to this Cleanup to the extent applicable. *See* Response 1.1. Under Resolution No. 92-49, setting cleanup levels may require two distinct analyses to be undertaken in a two-step process. First, a determination must be made regarding *whether* it is economically and/or technologically feasible to cleanup to background. If cleanup to background is technologically and economically feasible, that is the end of the inquiry and background is the appropriate cleanup level under Resolution No. 92-49. A number of comments propose different ways to look at whether cleanup to background is economically feasible, but as discussed below, each method employed results in the conclusion that it is not.

Because cleanup to background is not economically feasible, a second and distinct analysis must be undertaken under Resolution No. 92-49. Specifically, the text of the Resolution mandates alternative cleanup levels must result in:

“[t]he best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on these waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background, apply Section 2550.4 of Chapter 15 ... any such alternative cleanup shall:

1. Be consistent with maximum benefit to the people of the state;
2. Not unreasonably affect present and anticipated beneficial use of such water; and
3. Not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards[.]”  
Resolution No. 92-49, § III (G).

EHC and Coastkeeper assert that constituent concentration limits for alternative cleanup levels less stringent than background *must* be the lowest that are technologically and/or economically achievable. Their argument is based on language found in section 2550.4(c) of Chapter 15 of Title 23 of the California Code of Regulations. However, as detailed in the Cleanup Team’s Response 1.1, Chapter 15 and section 2550.4 apply to cleanups at Class I Waste Management Units, and only “applicable provisions” of Chapter 15 need be applied to the Shipyard Sediment Site cleanup. Even then, those “applicable provisions” need only be applied “to the extent feasible.” 23 Cal. Code Regs., § 2511(d).<sup>1</sup> While the alternative cleanup levels proposed in the TCAO take into consideration the achievement of the lowest concentrations that are

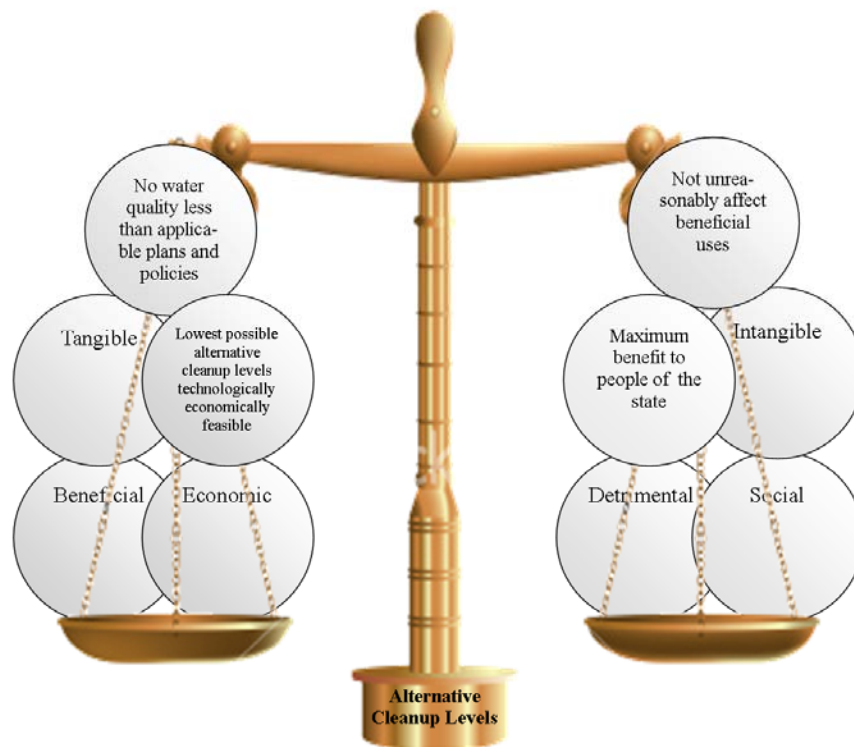
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<sup>1</sup> The Cleanup Team incorporates by this reference its Response 1.1 to Comments on Finding 1 relating to the applicability of section 2550.4(c) to this Response 31.1 as if set forth in full.

economically achievable, this consideration is not, and *cannot* be, the sole consideration for setting alternative cleanup levels.

This is because the specific language of Resolution No. 92-49 commands that the San Diego Water Board *must* consider the “total values involved, beneficial and detrimental, economic and social, tangible and intangible” when setting alternative cleanup levels. Considering only whether alternative cleanup levels are set at the most stringent level that is economically feasible, as EHC and Coastkeeper urge, would read this language out of the Resolution, make it “surplusage” and be an impermissible abuse of discretion. *See California Mfrs. Assn. v. Public Utilities Com.* (1979) 24 Cal.3d 836, 844; *Moyer v. Workmen’s Comp. Appeals Bd.* (1973) 10 Cal.3d 836, 844 [A statutory construction making some words surplusage is to be avoided. The words of the statute must be construed in context, keeping in mind the statutory purpose, and statutes or statutory sections relating to the same subject must be harmonized, both internally and with each other, to the extent possible.]. The DTR meets the test for statutory construction because it gives the important words “total values involved, beneficial and detrimental, economic and social, tangible and intangible” in Resolution No. 92-49 meaning and harmonizes them to the extent feasible with the words of section 2550.4(c). The DTR does consider setting alternative cleanup levels at the lowest levels that are economically achievable, but it does so in the context of the other factors Resolution No. 92-49 requires the San Diego Water Board to consider. Achieving the lowest cleanup levels that are economically feasible is but one of the factors the San Diego Water Board must consider when setting alternative cleanup levels under Resolution No. 92-49.

### 92-49 Total Values Approach to Alternative Cleanup Levels





DTR Section 32 addresses and assesses *all* of the factors required by Resolution No. 92-49. Critically, it analyzes the three enumerated subsections of Resolution No. 92-49 section (G), concluding that the alternative cleanup levels: (1) are consistent with maximum benefit to the people of the state; (2) do not unreasonably impact present and anticipated beneficial uses; and (3) do not result in water quality less than that prescribed in applicable water quality control plans and policies. DTR section 32.7 specifically weighs the various aspects of the “total values involved.” The decision about an appropriate alternative cleanup level is not driven by a single factor, but requires Water Boards to weigh a number of factors and strike the appropriate balance between them. In essence, the question “what is an appropriate alternative cleanup level” under Resolution No. 92-49 is one of policy. The Cleanup Team’s experience and neutrality make it uniquely situated among the Designated Parties to make the recommendation for alternative cleanup levels it makes in the DTR and TCAO. A recommendation that strikes the appropriate balance among all of the policy objectives of Resolution No. 92-49.

To better understand and balance the total values factors to be considered when establishing alternative cleanup levels under Resolution No. 92-49, BAE Systems provided a cost effectiveness analysis of the Shipyard Cleanup in its “Expert Report on Economic Feasibility Shipyard Sediment Site” (Arcadis, 2011; “the Arcadis Report”). The evidence in the Arcadis Report supports the “total values” approach to alternative cleanup levels set forth in the TCAO. See TCAO, Finding 32, DTR, § 32.7..2 “Compared to cleaning up to background cleanup levels, cleaning up to the alternative cleanup levels will cause less diesel emission, less greenhouse gas emission, less noise, less truck traffic, have a lower potential for accidents, and less disruption to the local community. Achieving the alternative cleanup levels also requires less barge and crane movement on San Diego Bay, has a lower risk of re-suspension of contaminated sediments, and reduces the amount of landfill capacity required to dispose of the sediment wastes.”

According to the Arcadis Report, cost effectiveness analysis is a well-accepted approach, with both the Office of Management and Budget and the U.S. EPA providing regulatory guidance for its use. Cost-effectiveness analysis is an economic methodology that is widely used to identify and select options that achieve the most effective use of limited resources (see for example OMB 2003, U.S. EPA 2000c).

In particular, the approach accounts for the added incremental costs to society compared to the incremental benefits from reductions in COC concentration levels for successively more stringent alternative cleanup level options. By measuring and evaluating the incremental increase in economic and social costs, both tangible and intangible, and the incremental reduction in COC concentration levels, the approach provides a means for comparing different alternative cleanup level options and selecting one that best meets Resolution No. 92-49’s “total values” mandate.

The Arcadis Report provided a robust discussion of the potential social costs associated with remedial dredging. The components of social costs include community impacts, habitat impacts, and business impacts. Community impacts associated with the remedial implementation include noise, increased traffic, air quality, and the potential for release of contaminants into San Diego Bay. The magnitude and duration of the impacts on community, habitat, and business are directly related to, and increase with the size and duration of the selected remedial option.

During construction, noise will be generated by construction equipment used in-water and at the upland sediment staging and dewatering site, as well as trucks transporting sediment through local neighborhoods and the City of San Diego to the landfill. Marine and road traffic will be increased in the vicinity of the upland sediment staging site. Marine traffic will be increased by equipment such as dredges, barges, tugboats, and support boats and may also be impacted by the presence of sediment re-suspension control devices (silt curtains, booms). Road traffic impacts may include noise, increased congestion on local streets, increased diesel and greenhouse gas emissions, and increased risk of accidents and death. It is anticipated that trucks will be used to transport sediment offsite from the sediment dewatering/processing site to an off-site landfill, and that this would be the greatest traffic impact of construction to the community. This traffic is expected to impact city streets used by local residents and workers (both vehicles and pedestrians). The number of trucks and duration of truck transport is directly related to the quantity of sediment dredged (Arcadis, 2011).

The Draft Environmental Impact Report (DEIR) estimates 50 sediment haul truck trips, eight delivery truck trips and twenty-nine employee vehicle trips per day will be required to implement the TCAO's alternative cleanup levels. *See* DEIR, § 4.1. The DEIR estimates that TCAO project will add 348 "passenger car equivalent" trips to the streets in the neighborhoods near the sediment dewatering and staging area and outward from there to the Otay Landfill. *Id.* Adding just eight polygons to the remedial footprint, as proposed by EHC and Coastkeeper, would result in an approximately twenty-five percent increase in sediment volume to be dredged and processed, and could add another year to the project duration and its temporary traffic impacts, or increase the daily traffic impacts by twenty five percent if implemented in the same remediation period. Because the TCAO's alternative cleanup levels are reasonably protective of beneficial uses, the additional social and economic costs of traffic impacts on the quality of life in and around the project area outweigh the incremental benefit of further COC concentration reductions. Temporary noise impacts from dredging, staging and dewatering activities caused by the use of bulldozers, cranes, loaders, rock slingers, excavators, tugs and barges would increase proportionally with a larger remedial footprint, and add to the social and economic costs.. *See* DEIR, § 4.4.

Air quality is another important quality of life parameter that may be impacted by the remediation. Vehicle, off-road, and diesel- and gasoline-powered marine equipment may increase pollutant emissions and greenhouse gasses. Dredging and handling of contaminated sediment may result in air emissions through volatilization, airborne particulate matter, or fugitive dust. Decaying vegetation/biota in the sediment could cause offensive odors (Arcadis, 2011).

In fact, the DEIR for the TCAO identified significant and unavoidable impacts after mitigation associated with construction equipment/vehicle emissions. Specifically, emissions during the dredging and drying of sediment would result in nitrogen oxides emissions that exceed the City-established daily emissions threshold for that pollutant. Cumulative air emissions of nitrous oxide were also found to be significant and unavoidable. Section 4.6 of the DEIR details the significant unavoidable air quality impacts that would be caused by the TCAO project. Increasing the dredge footprint directly and proportionally increases these impacts, adding social and economic costs to the total values consideration under Resolution No. 92-49. Because the

TCAO's alternative cleanup levels do not unreasonably impact beneficial uses, added social and economic costs from adverse air quality impacts are not justified.

Although mitigation will be required, dredging will destroy benthic macroinvertebrate communities and eelgrass habitat, as well as cause re-suspension of sediments. Increased water depths from dredging may result in permanent habitat changes. Eelgrass for example, would be affected by deeper water. (Arcadis, 2011). Because benthic and aquatic wildlife beneficial uses are reasonably protected by the TCAO's alternative cleanup levels, increasing the size of the dredge footprint could needlessly eliminate currently-healthy benthic communities and eel grass beds. *See* DEIR, § 4.5.

The Arcadis Report also provided more detailed information on potential economic impacts to the shipyards. Remedial implementation will directly impact the shipyards and may indirectly impact shipyard customers, shipyard employees, subcontractors and suppliers, and the local economy. The shipyards' work is scheduled several years in advance, and shipyard berths and dry docks are generally fully utilized. Interruptions and delay in ship construction activities caused by the sediment cleanup have the potential to expose the shipyards to millions of dollars in potential damages to both their customers and subcontractors. Interruptions in repair activities would have significant adverse consequences to shipyard employees, subcontractors, and Navy contractors. If larger contracts cannot be completed because of disruptions due to the cleanup, this work would have to be done at facilities outside of San Diego Bay, perhaps even outside of California, affecting the tax base as well as local businesses.

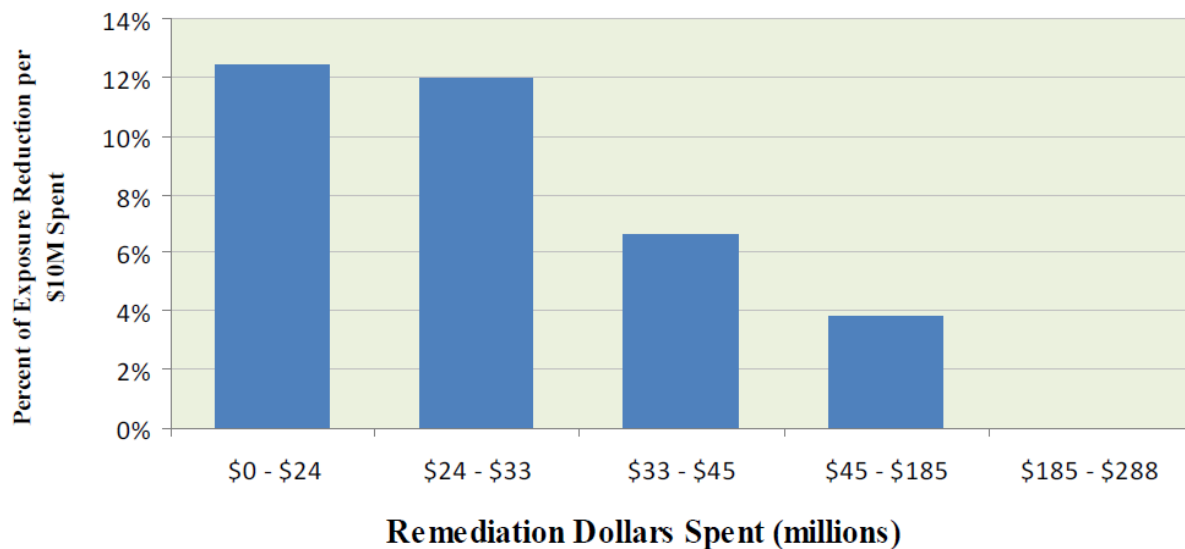
The cost effectiveness analysis showed that as the size of the remedial footprint increases, the incremental cost per exposure reduction also increases. In other words, the larger the cleanup footprint, the lower the cost effectiveness of the cleanup, and the greater the impact on the social and economic considerations of quality of life, community, habitat, and businesses. Once the threshold of reasonable protection of beneficial uses is achieved, the economic and social costs of further reductions in COC concentrations become comparatively detrimental at this Site.

The alternative cleanup levels are reasonably protective of the beneficial uses of San Diego Bay. Furthermore, the cost effectiveness of the cleanup will decrease with a larger remedial footprint while causing greater quality of life, community, habitat, and business impacts. Therefore, the alternative cleanup levels properly balance the social and economic factors required by Resolution No. 92-49.

Economic feasibility and achievability are terms of art under Resolution No. 92-49. There are no prescribed methodologies in statute, regulation, or case law for determining the economic feasibility of cleaning up to background, or for determining the point at which cleanup levels become the lowest levels that are economically achievable. Perhaps NASSCO put it best when it commented that an economic feasibility analysis conforming to Resolution No. 92-49 must determine the point at which additional remediation no longer produces an additional benefit that is sufficient to justify the associated additional expense of such remediation. NASSCO is also correct that the selection of the point at which incremental benefits no longer justifies incremental costs is primarily a policy decision, requiring best professional judgment, not a simple mathematical determination.

Figure 31-1 clearly shows that when the least contaminated polygons are added to the footprint (scenario 11), exposure reduction is negligible compared to the cost of cleanup. Figure 31-1 also shows that cleaning up the first 18 polygons at a cost of about \$33 million yields the highest exposure reduction per unit cost compared to the other scenarios. The \$58 million estimated cost of the remedial footprint cannot be directly overlaid on Figure 31-1. This is because different methods and assumptions were used to derive the remedial footprint and alternative cleanup levels compared to the evaluation of the feasibility of cleaning up to background. For example, the analyses of economic feasibility to cleanup to background used all 66 polygons, including NA22 (which was later removed from consideration), and the three polygons determined to be technologically infeasible to dredge. The statement in Section 32.7.1 that “[C]leaning up additional areas beyond the proposed remedial footprint would yield about 4 percent additional exposure reduction per \$10 million spent” may not be justified and will be revised. A more reasonable interpretation of the economic feasibility analysis as it relates to the remedial footprint is that the \$58 million cost estimate for the cleanup of the proposed remedial footprint, which consists of 23 polygons, is at a point beyond the initial high exposure reduction per cost scenario represented by the first 18 polygons. The cost effectiveness analysis in the Arcadis Report also supports this conclusion. Thus, the Cleanup Team is satisfied that the alternative cleanup levels are the lowest that are economically achievable in light of the “total values” analysis required by Resolution No. 92-49.

**Figure 31.1 Percent Exposure Reduction versus Remediation Dollars Spent**



Following are detailed responses to the comments in this group.

1. San Diego Water Board’s Findings are Arbitrary

The San Diego Water Board’s findings are based on substantial evidence and are not arbitrary and capricious. Coastkeeper and EHC commented that the economic feasibility findings are

arbitrary and capricious and are based on their follow up comments on the data, assumptions, analysis, and presentation. Those comments are addressed in more detail below.

## 2. Assumptions and Data Used

Coastkeeper and EHC correctly pointed out that the economic feasibility analysis in Section 31 did not consider certain factors as stated in Finding 31. The San Diego Water Board did not consider cost criteria for effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources in the economic feasibility analysis to cleanup to background. As stated on p. 31-1, the benefits of remediation are best expressed as the reduction in exposure of human, aquatic wildlife, and benthic receptors to site related COCs. The only costs considered in the analysis were the costs of achieving exposure reduction. CAO Finding 31 and DTR Section 31 will be revised to clarify this point. The revisions will be provided on September 15, 2011, as required in the Third Amended Order of Proceedings.

Coastkeeper and EHC commented that the San Diego Water Board's conclusions must be supported by substantial evidence in the record. They also commented that the economic feasibility analysis is not supported by substantial evidence in the record because key information, including cost assumptions, pollution reduction assumptions, and dredging volume assumptions are either not provided or have been provided without a citation as to the source of the information.

Itemized cost data was not provided in the Appendix to DTR Section 31. Also, in reviewing this comment, the Cleanup Team discovered that some important data was inadvertently excluded from the Appendix to Section 31. Revisions to the Appendix to Section 31 will be provided on September 15, 2011, as required by the Third Amended Order of Proceeding. These revisions include the missing data from Table A31, and include a new table which contains itemized cost data for the 11 cleanup scenarios analyzed. The new table shows the data and information in the Excel spreadsheet named "Economic Feasibility Source Data.XLSX." The cost data and assumptions in the spreadsheet were provided by Anchor QEA, L.P. (Anchor) with input from some of the Responsible Parties (NASSCO, BAE Systems, SDG&E, City of San Diego, and the Port District). The Cleanup Team provided this spreadsheet to Coastkeeper and EHC in response to discovery questions posed to the Cleanup Team.

Coastkeeper and EHC questioned the cost assumptions provided by Anchor stating that there is no showing that the assumptions are appropriate, nor is there any information about the source of the cost assumptions for "Eelgrass Habitat Mitigation" and "Eelgrass Land Lease Costs (in perpetuity)". They also comment that without this information, the public cannot evaluate the reliability of that data and assumptions. Anchor provided the assumptions in the itemized cost spreadsheet referred to in the comment. Anchor is an expert in the field of marine dredging and has the knowledge and ability to estimate the costs for the cleanup scenarios. The Cleanup Team sees no need to request additional justification for the cost assumptions.

Coastkeeper and ECH also requested information on the pollution reduction assumptions and dredge volume assumptions. This information, found in DTR Sections 31 and 32, and their respective appendices is shown below.

Assumptions made for calculating exposure (pollution) reduction:

- a. The sediment concentration at each station is assumed to be the same concentration throughout the polygon.
- b. For each of the 11 cleanup scenarios, each polygon that is remediated is assumed to have background concentrations for the five primary COCs.
- c. The percent exposure reduction was calculated using the following equation:

$$\% \text{ Exposure Reduction} = (\text{Final Exposure Reduction} / \text{Current Exposure}) \times 100$$

Or to use the equation on page 31-2 of the DTR

$$\% \text{ Exposure Reduction} = (\text{SWAC}_{\text{current}} - \text{SWAC}_{\text{final}}) / (\text{SWAC}_{\text{current}} - \text{Background}) \times 100$$

Where,

SWAC<sub>current</sub> was calculated from Exponent (2003) sediment chemistry data ("SWAC<sub>current</sub>" is the same as "pre-remedial SWAC" or "SWAC<sub>pre-remedy</sub>." Values for SWAC<sub>current</sub> are shown on the bottom line in Table A32-1).

SWAC<sub>final</sub> is the surface weighted average concentration of the site assuming that the polygons cleaned in a scenario have background sediment concentrations. (The terms "SWAC<sub>final</sub>" and "SWAC<sub>post-remedy</sub>" mean the same thing. Section 31 has been revised to change the term "SWAC<sub>final</sub>" to "SWAC<sub>post-remedy</sub> for clarity. Values are shown in Table A31-1 under the column heading "SWAC").

Background = Background concentration (values are shown in Table 29-1).

SWAC post-remedy can be calculated using the SWAC equation on page 32-11 and by replacing the sediment chemistry concentration for the stations "cleaned up" in each scenario with background concentrations. For example, replace the primary COC sediment chemistry values with background concentrations for the six worst stations and calculate the SWAC; this will result in the SWAC post-remedy value for scenario one. Replace the twelve worst stations with background concentrations and calculate the SWAC; this will result in the SWAC post-remedy value for scenario two. Continue this process for all the remaining scenarios.

Assumptions made for calculating dredge volume:

- a. Dredge volume was calculated by multiplying "depth to dredge" by "polygon area." "Polygon area" values are in Table A32-1.
- b. "Depth to dredge" values were calculated from sediment chemistry data (Exponent, 2003). Values are shown in Table A31-2 under the column heading "w/1' Overdepth (ft)".

Coastkeeper and EHC requested a definition of the term "sur" which appears in Table 31-2 in the column labeled "Depth to Clean (ft)". NASSCO's rebuttal explanation above of the term "sur" is correct.

Coastkeeper and EHC questioned the adequacy of the number of core samples used to estimate the depths to dredge, and thus the dredge volumes in each polygon. Additional core samples are not needed to estimate dredge volumes for this analysis. Sediment core samples were collected at thirty eight sampling stations, more than half of the 66 stations. The core sample data generally shows the same relationships as the surface sample data. That is, the core samples have higher COC concentrations near shore and near sources, and lower concentrations off shore. Therefore, for the purpose of estimating dredge volumes, interpolating depths to background concentrations by using nearest neighbor core data is adequate and appropriate.

Coastkeeper and EHC pointed out that the DTR states on p. 31-2 that the economic feasibility analysis used Triad data and SS-MEQ. Only surface sediment chemistry data from the Triad data set was used to rank the polygons (see Section 32.2.3 for polygon ranking methodology). This revision to Section 31 will be included in the revisions provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

### 3. Data Analysis and Presentation

Coastkeeper and ECH commented that the presentation of the economic feasibility data in "six polygon groups" was arbitrary, and that the DTR provided no explanation or rationale why stations were evaluated in groups of six. As NASSCO stated, since the Shipyard Sediment Site was divided into 66 polygons, cost scenarios of six stations each were used because 66 is evenly divisible by six. Dividing the polygons into groups of six resulted in 11 data points, which was sufficient to show the relationship between increasing cost and increasing mass removal.

NASSCO pointed out in its rebuttal that, whether the chart of the cost/benefit scenarios in Figure 31-1 uses 5 bars or 11 bars, the data shows the same trend, and supports the conclusion that cleaning up to background sediment concentrations at the site is economically infeasible. Reducing the number of bars used to display the cost/benefit scenarios from 11 to 5 was intended to simplify the chart but still show the trend of total cost increasing faster than the rate of exposure reduction per unit cost.

NASSCO commented that monitored natural attenuation is the proper remedy, however, the economic feasibility of natural attenuation is not relevant since this remedy does not meet the requirements of the TCAO. Response 33.1 addresses NASSCO's comments on natural attenuation as the proper remedy at the Shipyard Sediment Site.

### 4. Cost Versus Benefit

Coastkeeper and ECH commented that the DTR incorrectly summarizes cumulative exposure reduction based on the Cleanup Team's discovery responses. Coastkeeper and EHC appear to misunderstand the Cleanup Team's discovery responses. The responses state that Coastkeeper's assumption that each cleanup scenario only contains six polygons is incorrect. The first scenario

contains six polygons; the second scenario contains 12 polygons; the third contains 18 polygons; etc. In other words, each scenario contains six more polygons than the previous scenario. Furthermore, the discovery responses reiterate and clarify the DTR that the Cumulative Exposure does continue to decrease consistently and continuously while the Incremental Exposure does consistently (trend) decrease but not continuously.

The highest rate of exposure reduction is still before the \$33 million mark, and therefore, the highest benefit is in the first 18 polygons remediated and \$33 million spent. As NASSCO pointed out, regardless of whether the 11 hypothetical cost scenarios are grouped into five ranges or presented as 11 independent calculations, the underlying cost-benefit relationship is the same.

## 5. Alternative Cleanup Levels

Coastkeeper and EHC claimed that by lumping polygons together in groups of six, the analysis fails to provide the data to allow the San Diego Water Board to determine that the alternative cleanup levels should be set at a level that falls in between the groups of six polygons. They also argue that the DTR's conclusion that "4 percent additional average pollutant exposure reduction per \$10 million spent is not economically achievable" is arbitrary.

As previously discussed in this response, the \$58 million estimated cost of the remedial footprint cannot be directly overlaid on Figure 31-1 because of the differences in methods and assumptions between the economic feasibility analysis and the alternative cleanup levels/remedial footprint analysis. The statement in Section 32.7.1 that "[C]leaning up additional areas beyond the proposed remedial footprint would yield about 4 percent additional exposure reduction per \$10 million spent" may not be justified and will be revised. A more reasonable interpretation of the economic feasibility analysis as it relates to the remedial footprint is that the \$58 million cost estimate for the cleanup of the proposed remedial footprint, which consists of 23 polygons, is at a point beyond the initial high exposure reduction per cost scenario represented by cleaning up the first 18 polygons. Thus, the Cleanup Team is satisfied that the alternative cleanup levels are the lowest that are economically achievable.

Coastkeeper and EHC pointed out that the DTR states in Section 32.3 that the cleanup levels were "established by economic analysis." This statement in the DTR is incorrect. The alternative cleanup levels were established by the SWAC approach as described in Section 32.2. A revision to Section 32.3 will be provided on September 15, 2011, as required by the Third Amended Order of Proceeding.

## 6. Constituent by Constituent Analysis

Coastkeeper and EHC commented that Resolution No. 92-49 requires that economic feasibility be evaluated on a constituent by constituent basis. As discussed fully in Response 1.1, conducting a constituent by constituent economic feasibility analysis is an unrealistic interpretation of Resolution No. 92-49 and is not required.

Coastkeeper and EHC comment that averaging the pollutant reduction concentration in the analysis for the five primary COCs masks the variability of exposure reduction for individual



pollutants. The San Diego Water Board agrees with NASSCO's rebuttal the Coastkeeper's and EHC's proposed constituent by constituent analysis merely illustrates that the five primary COCs are not identically distributed across the site, does not address net remedial cost-benefit, and confirms that incremental benefits generally decrease with increasing cost.

## 7. Benthic Risk Exposure

As NASSCO has correctly pointed out, benthic community evaluation cannot be represented by an average sediment concentration because benthic organisms are for the most part stationary. No areas of likely benthic impacts were omitted from the remediation footprint due to economic feasibility analysis. Furthermore, in Response 18.4, the San Diego Water Board rejected the toxic unit approach for assessing impact to the benthic community. Thus, there is no need to revise the economic feasibility analysis based on this approach.

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### RESPONSE 31.2

**DTR Section:** 30, 31, 32, 37

**Comments Submitted By:** NASSCO

**Comment IDs:** 161

#### **Comment**

NASSCO commented that implementing the TCAO would have significant negative economic and social impacts on NASSCO and the community and that monitored natural attenuation is the proper remedy.

Under Resolution No. 92-49, the Regional Board must take into account the total values involved, including economic and social values. The DTR concludes that dredging to alternative cleanup levels is technologically and economically feasible. TCAO, at ¶¶ 30, 31, DTR, at 30-7, 31-3. However, extensive dredging at NASSCO would result in significant negative impacts to NASSCO and the surrounding community; thus, taking these values into account, dredging is costly and unjustified, especially since there are little or no corresponding benefits to human health or the environment.

In particular, dredging in certain areas at NASSCO may jeopardize the integrity of slopes and structures at the leasehold, and is technologically infeasible in certain areas. Barker Depo, at 154:25 – 155:22, 156:23 – 157:16. For example, there are significant structural stability problems associated with dredging around piers, pilings, and steep slopes, such as those surrounding the floating drydock sump, which render dredging in such areas technologically infeasible. *Id.* Further, vital ship repair and construction activities will be significantly disrupted by dredging, and could result in delays or contractual breaches with the U.S. Navy and other customers. See, e.g., Exponent Report, at §§ 18.2, 18.4.

Large-scale dredging will also impact the surrounding community, and potentially present environmental justice issues, due to impacts including, but not limited to increased truck traffic, diesel emissions from trucks and heavy equipment, noise, accident risks, transportation of large volumes of waste through the neighborhood, increased traffic on local streets, and the need to establish large staging areas for dewatering activities. *Id.*

### **Response 31.2**

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The “total values involved” in setting the alternative cleanup levels, including economic and social values, are discussed in DTR Section 32.7. This discussion is augmented with the additional information provided in the DEIR and Arcadis Report (2011), as discussed in Response 31.1 above. The Cleanup Team agrees that dredging to achieve the alternative cleanup levels could have significant negative economic and social impacts on NASSCO and the community. When balanced with the other “total values involved,” however, monitored natural attenuation is not the proper remedy for the reasons put forth below.

The TCAO describes a proposed project to implement and comply with the requirements of the TCAO in Findings 33 and 34 ( see also DTR sections 33 and 34) . The TCAO determined that dredging and disposal of sediments is the proposed remedy for approximately 15.2 acres of the site and is expected to generate approximately 143,400 cubic yards (cy) of contaminated marine sediment. In addition to the 15.2 acres targeted for dredging, approximately 2.3 acres of the project site are inaccessible or under-pier areas that will be remediated by one or more methods other than dredging, most likely by application of clean sand cover.

Resolution No. 92-49 requires that an alternative cleanup level be consistent with maximum benefit to the people of the State of California. The Cleanup Team appropriately and broadly considered the alternative cleanup levels including the scope of the dredging needed to attain those levels (DTR Section 37.3.2) and determined that proposed alternative cleanup levels were consistent with maximum benefit to the people of the State based on the San Diego Bay resource protection, mass removal and source control, and economic considerations. These considerations included the following:

1. Remediated areas will approach reference area sediment concentrations for most COCs,
2. All areas identified with “Likely” impacts to benthic beneficial use will be remediated,
3. Adverse impacts to benthic communities from dredging will be temporary, with stasis expected within approximately three years,
4. The alternative cleanup levels support human health, aquatic dependent wildlife, and aquatic life beneficial uses,
5. Impacts on local communities associated with remedial activities are temporary and will be mitigated where feasible,
6. Remedial activities will cause no adverse effects to sport or commercial angling, or to contact or non-contact water recreation beneficial uses because they will take place inside the shipyard security boom,
7. Adverse effects to eelgrass beds from dredging will be mitigated to levels of insignificance following remediation,
8. Source control will be effectuated at the dischargers’ storm water facilities,
9. Significant contaminant mass removal from San Diego Bay will be attained ( see DTR Table 32-25),
10. Environmental conditions of San Diego Bay are improved in balance with ensuring that vital City of San Diego services can also be maintained so that crime should not increase, fire protection should be sufficient, and a host of other City services should not decline and impair the City’s economy and vibrancy, and

11. Attainment of the alternative cleanup levels will result in no long-term loss of use of the Shipyard Sediment Site during the phased cleanup, thereby furthering continued operation of the shipyards, including vessel construction, maintenance and repair, and the concomitant employment of persons in the San Diego Region.

The Cleanup Team concurs that structures such as pile bulkheads, rock reveted slopes, piers, and pilings will need to be protected during dredging operations and anticipates that such protection and/or support will be installed iteratively during remedial activities. ( See DTR 35-3.) The DTR provides at page 33-11 that for under-pier areas and other locations, where significant impacts to infrastructure (e.g., piers, wharves and bulkheads) are likely, alternatives to dredging should be considered. For example, sand covering is proposed in areas immediately adjacent to sheet pile bulkheads and beneath piers, and is expected to result in achievement of target SWAC concentrations and aquatic life beneficial use concerns. Where necessary, rock or gravel may also be used to fortify or stabilize the sand capping in these set-back areas. Inaccessible areas under piers will be remediated using technically feasible techniques such as placement of a sand layer, nominally 1 to 2 feet in thickness, on top of existing sediment. Design details of the remedial action will be specified in the Remedial Action Plan required by the TCAO in Directive B.1.

Dredging impacts to the integrity of slopes and structures at the NASSCO leasehold were also considered by the Cleanup Team in determining that dredging was infeasible at certain locations in the leasehold (See DTR page 33-8). The Cleanup Team concluded that the NA07, NA08, NA23, and NA27 polygons all had technical infeasibility problems associated with dredging. The NA07 polygon is technically infeasible to dredge due to stability concerns about the sheetpile bulkhead on the shoreline and slope near the floating dry dock sump. Any dredging in this area would drastically undermine the slope as well as impacting the sheetpile bulkhead on the east side. The NA08 polygon is technically infeasible to dredge due to stability concerns about the sheetpile bulkhead on the shoreline and slope near the floating dry dock sump. Any dredging in this area would drastically undermine the slope as well as impacting the sheetpile bulkhead on the east side. The east side of NA08 also supports the structure of the gate at Ways 4. Any dredging in this area would drastically undermine the slope as well as impact the sheetpile bulkhead on the east side. The NA23 polygon is technically infeasible to dredge because dredging would affect Pier 12, the tug boat pier, the rip-rap shoreline, as well as undermining the sediment slope for the floating dry dock sump.

The Cleanup Team determined that the cleanup proposal to attain the alternative cleanup levels described in the TCAO is a “project” as defined by CEQA Guidelines section 15180, and that the undertaking may have a significant impact on the environment. The Cleanup Team consequently prepared a DEIR in accordance with CEQA (Public Resources Code section 21000 et seq.) and the CEQA Guidelines (CCR Title 14, section 15000 et seq.) to analyze the proposed project’s potential impacts on the environment, to discuss alternatives, and to propose mitigation measures for identified potentially significant impacts that will minimize, offset, or otherwise reduce or avoid those environmental impacts. With respect to environmental justice issues the DEIR at appendix H concludes that the proposed project with suggested mitigation incorporated would not result in a disproportionate impact to low income and minority populations. This analysis

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satisfies the San Diego Water Board's obligations to consider environmental justice principals pursuant to Government Code section 65040.12.

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## 32. TCAO Finding 32 and DTR Section 32: Alternative Cleanup Levels

Finding 32 of CAO No. R9-2011-0001 states:

Under State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, the San Diego Water Board may prescribe alternative cleanup levels less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible. Resolution No. 92-49 requires that alternative levels must be set at the lowest levels the discharger demonstrates and the San Diego Water Board finds is technologically and economically achievable. Resolution No. 92-49 further requires that any alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial uses of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

The San Diego Water Board is prescribing the alternative cleanup levels for sediment summarized in the table below to protect aquatic life, aquatic-dependent wildlife, and human health based beneficial uses consistent with the requirements of Resolution No. 92-49. Compliance with alternative cleanup levels will be determined using the monitoring protocols summarized in Finding 34 and described in detail of Section 34 of the Technical Report.

### Alternative Cleanup Levels: Shipyard Sediment Site

Aquatic Life	Aquatic Dependent Wildlife and Human Health	
Remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community.	Surface Weighted Average Concentrations (site-wide)	
	Copper	159 mg/kg
	Mercury	0.68 mg/kg
	HPAHs <sup>1</sup>	2,451 µg/kg
	PCBs <sup>2</sup>	194 µg/kg
	Tributyltin	110 µg/kg

1. HPAHs = sum of 10 PAHs: Fluoranthene, Pyrene, Benzo[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo(a)pyrene, indeno[1,2,3-c,d]pyrene, Dibenz[a,h]anthracene, and Benzo[g,h,i]perylene.

2. PCBs = sum of 41 congeners: 18, 28, 37, 44, 49, 52, 66, 70, 74, 77, 81, 87, 99, 101, 105, 110, 114, 118, 119, 123, 126, 128, 138, 149, 151, 153, 156, 157, 158, 167, 168, 169, 170, 177, 180, 183, 187, 189, 194, 201, and 206.

In approving alternative cleanup levels less stringent than background the San Diego Water Board has considered the factors contained in Resolution No. 92-49 and the California Code of Regulations, Title 23, section 2550.4, subdivision (d):

***Alternative Cleanup Levels are Appropriate.*** Cleaning up to background sediment quality levels at the Shipyard Sediment Site is economically infeasible. The alternative cleanup levels established for the Shipyard Sediment Site are the lowest levels that are technologically and economically achievable, as required under the California Code of Regulations Title 23 section 2550.4(e).

***Alternative Cleanup Levels are Consistent with Water Quality Control Plans and Policies.*** The alternative cleanup levels provide for the reasonable protection of San Diego Bay beneficial uses and will not result in water quality less than prescribed in water quality control plans and policies

adopted by the State Water Board and the San Diego Water Board. While it is impossible to determine the precise level of water quality that will be attained given the residual sediment pollutant constituents that will remain at the Site, compliance with the alternative cleanup levels will markedly improve water quality conditions at the Shipyard Sediment Site and result in attainment of water quality standards at the site.

***Alternative Cleanup Levels Will Not Unreasonably Affect Present and Anticipated Beneficial Uses of the Site.*** The level of water quality that will be attained upon remediation of the required cleanup at the Shipyard Sediment Site will not unreasonably affect San Diego Bay beneficial uses assigned to the Shipyard Sediment Site represented by aquatic life, aquatic-dependent wildlife, and human health. Cleanup of the remedial footprint will restore any injury, destruction, or loss of natural resources.

***Alternative Cleanup Levels are Consistent with the Maximum Benefit to the People of the State.*** The proposed alternative cleanup levels are consistent with maximum benefit to the people of the State based on the San Diego Bay resource protection, mass removal and source control, and economic considerations. The Shipyard Sediment Site pollution is located in San Diego Bay, one of the finest natural harbors in the world. San Diego Bay is an important and valuable resource to San Diego and the Southern California Region. The alternative cleanup levels will result in significant contaminant mass removal and therefore risk reduction from San Diego Bay. Remediated areas will approach reference area sediment concentrations for most contaminants. Compared to cleaning up to background cleanup levels, cleaning up to the alternative cleanup levels will cause less diesel emission, less greenhouse gas emission, less noise, less truck traffic, have a lower potential for accidents, and less disruption to the local community. Achieving the alternative cleanup levels also requires less barge and crane movement on San Diego Bay, has a lower risk of re-suspension of contaminated sediments, and reduces the amount of landfill capacity required to dispose of the sediment wastes. The alternative cleanup levels properly balance reasonable protection of San Diego Bay beneficial uses with the significant economic and service activities provided by the City of San Diego, the NASSCO and BAE Systems Shipyards and the U.S. Navy.

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### RESPONSE 32.1

**DTR Section:** 32

**Comments Submitted By:** NASSCO, BAE Systems, Coastkeeper and EHC

**Comment IDs:** 31, 34, 129, 130, 131, 132, 135, 156, 165, 173, 194, 195, 196, 197

**Comment**

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NASSCO and BAE Systems submitted several comments that natural attenuation is occurring at the Shipyard Sediment Site and that monitored natural attenuation is the proper remedy for the Site. At a minimum, natural attenuation should be considered as a component of the remediation required. The remedial footprint as set forth in the TCAO and DTR does not adequately take into account the natural attenuation that has occurred.

Comparison of the sediment concentration data collected 2001 and 2003 (Exponent 2003) with recently collected data collected in July 2009 ("NOW" testing) and 2010 / 2011 (AMEC 2011) indicate that natural attenuation is occurring. Analyzing samples obtained by AMEC at the BAE

leasehold, Environ concludes that concentrations of the five primary COCs in the surface sediment have decreased 24 to 76 percent.

While the only data available to evaluate whether natural attenuation is occurring is for samples outside the remedial footprint, it can be reasonably extrapolated that the same or greater natural attenuation is occurring within the shipyard areas designated for remediation.

In addition to the fact that monitored natural attenuation is already occurring, the following site-specific circumstances support monitored natural attenuation as the preferred remedy for the Site:

1. The fact that NASSCO will remain a secured shipyard until at least 2040 supports implementation of monitored natural attenuation because security measures will prevent human exposure to site contaminants and wildlife during the recovery period.
2. The shipyard has incorporated extensive pollution prevention controls to eliminate the possibility of direct releases of contamination.

Taken together, the site-specific factors present at NASSCO strongly support monitored natural attenuation, and meet the criteria identified in the DTR that indicate that a site is “particularly conducive” to monitored natural attenuation.

The difference in risk reduction between the proposed footprint and monitored natural attenuation is insignificant and does not meet the State Board's test for economic feasibility. Given these already favorable site conditions, any incremental benefits associated with dredging will be minimal, and not justified by the incremental costs, particularly where there is evidence that such dredging will cause greater environmental harm than leaving the sediment in place.

Since the potential for recontamination from off-site sources would affect all potential remedies, it is not a factor that should favor one potential remedy over another.

In rebuttal, Coastkeeper and EHC commented that natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons. No reliable data have been presented in the public record that demonstrate that natural attenuation is occurring at the Site. NASSCO and BAE Systems argue that sediment chemistry data collected at five locations in 2009 provide the necessary and sufficient evidence to demonstrate that contaminant concentrations are decreasing at the site. However, five samples do not provide a data set that is sufficiently robust to characterize current contaminant concentrations at the Site. In addition, neither NASSCO nor BAE presented evidence demonstrating that variability in contaminant concentrations is not due to sampling issues such as sampling location, sampling depth, analytical methods, or other factors.

References to data collected by AMEC in 2010 are not relevant because that data is not yet a part of the administrative record. The Regional Board may not consider this data because San Diego Coastkeeper and Environmental Health Coalition were not provided with this data and given a

full and fair opportunity to review and vet that data prior to the close of the comment and rebuttal period.

No evidence demonstrates that monitored natural attenuation would reduce pollutant concentrations to levels that would protect human health and the environment within a reasonable time frame. Sediment chemistry data alone do not provide a basis for demonstrating that risks to benthic invertebrates or fish would be adequately reduced by natural attenuation. This means that even if valid sediment chemistry data existed that showed reduced pollutant concentrations since 2001, such data would not be sufficient to demonstrate that monitored natural attenuation would be appropriately protective of human health and the environment. Pore-water chemistry, whole-sediment toxicity, invertebrate-tissue chemistry, and fish-tissue chemistry would also be required to demonstrate that natural attenuation is reducing exposure of ecological receptors to contaminants at the Site. Neither NASSCO nor BAE Systems has submitted data to support their claim that monitored natural attenuation would be protective of human health and the environment.

The pollutants at the Site have the potential to migrate off site due to the nature of the activities at the Site. Monitored natural attenuation is not appropriate for use at sites where contaminants have the potential to migrate to other areas. Neither NASSCO nor BAE have provided evidence to demonstrate that contaminants of concern at the Site are stable under the range of conditions that occur at the site. On the contrary, activities at the site, such as ship maintenance and repair (and associated prop wash), have the potential to remobilize sediment-associated pollutants and result in off-site transport. Likewise, storms and tidal current could exacerbate off-site contaminant transport at the Site.

### **Response 32.1**

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Monitored natural attenuation (MNA) alone is not sufficient to meet TCAO remediation goals in a reasonable time frame or to assure protection of beneficial uses over the long term. However, the proposed dredge area is approximately 11 percent of the total area of the Shipyard Sediment Site and most of the areas outside the proposed dredge area, approximately 89 percent of the Site, have several primary and secondary chemicals of concern (COCs) above background levels. Therefore, if natural attenuation is occurring, it will serve to reduce the pollutant levels in those areas not slated for active remediation by dredging.

MNA is sometimes appropriate for sites that have high deposition rates where newly deposited clean material tends to sequester or dilute the sediments with higher concentrations. The Shipyard Sediment Site does not have high deposition rates as evidenced by the relative lack of maintenance dredging conducted at the Site over the last few decades. In addition, an active shipyard has frequent disturbances to the sediment, for example via ship movements and propeller wash, that tends to re-suspend the sediments which would uncover and expose any previously buried sediments. The core data from the Shipyard Sediment Site indicate that, in many locations, the pollutant concentrations at depth are significantly higher than those in the shallower sediments. Therefore, any disturbances are likely to uncover and expose higher concentrations.



In addition, MNA is typically not very effective at sites with metals, PCBs, and other contaminants that do not readily biodegrade or otherwise transform into less toxic or bioavailable forms.

Comparison of the limited sediment chemistry data collected in July 2009 ("NOW" testing), and from 2010 to 2011 (AMEC 2011), to that collected in 2001 and 2003 (Exponent 2003) is not sufficient to demonstrate that natural attenuation is occurring. It is even more tenuous to imply that those data can be used to draw reliable conclusions about the rate at which natural attenuation might be occurring, especially considering that no studies have been done to determine what processes, if any, are responsible for lower COC concentrations at the sampling stations in the 2009, and 2010 to 2011 data sets compared to the 2001 and 2003 data sets. The more recent sampling activities in 2009 and 2010 / 2011 primarily collected samples to determine sediment chemistry concentrations for a few analytes and were not designed to obtain all of the other information necessary to evaluate natural attenuation. In addition, the 2009 and 2010 / 2011 samples were collected in very limited areas compared to the entire Shipyard Sediment Site and most were collected outside the areas with the highest concentrations proposed for dredging.

Other factors that must be accounted for when attempting to compare two data sets (i.e. the 2009 and 2010 / 2011 data compared to the 2001 / 2003 data) is variability in contaminant concentrations due to sampling location, sampling depth, and analytical methods (e.g. different laboratories). Each sediment sample is unique and any subsequent sampling, whether or not it is collected contemporaneously or years later, is from a different portion of the sediment. Since the Shipyard Sediment Site has considerable heterogeneities, duplicate samples, even those collected during the same sampling event, frequently exhibit these large variability. For example, the AMEC 2010/2011 sampling, as reported in AMEC's March 2011 Final Technical Report, collected duplicate samples G11 and G11 Dup from the same location. G11 had 3,740 ug/kg total HPAHs and G11 Dup had 5,360 ug/kg HPAHs, a 43 percent difference. Similarly, G17 and G17 Dup had 994 ug/kg and 284 ug/kg HPAHs, respectively, a 71 percent difference. Since these samples were collected at the same time, same location, and analyzed by the same laboratory, this large difference can be attributed primarily to heterogeneities in the sediment. This variability of chemical concentrations due to heterogeneities is one reason it is inappropriate to draw any conclusions regarding natural attenuation based on a data set limited in sample density, areal extent, and types of analyses.

Regarding the site characterization data and analysis needed to evaluate a site for monitored natural attenuation, the U.S. EPA document "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" states in part that:

"Decisions to employ MNA as a remedy or remedy component should be thoroughly and adequately supported with site-specific characterization data and analysis. In general, the level of site characterization necessary to support a comprehensive evaluation of MNA is more detailed than that needed to support active remediation. Site characterizations for natural attenuation generally warrant a quantitative understanding of source mass; ... rates of biological and non-biological transformation; and an understanding of how all of these factors are likely to vary with time. This information is generally necessary since

contaminant behavior is governed by dynamic processes which must be well understood before MNA can be appropriately applied at a site. Demonstrating the efficacy of MNA may require analytical or numerical simulation of complex attenuation processes. Such analyses, which are critical to demonstrate natural attenuation's ability to meet remediation objectives, generally require a detailed conceptual site model as a foundation." (U.S. EPA, 1992b).

None of these more detailed site characterization activities and analyses needed to evaluate the Shipyard Sediment Site for a natural attenuation remedy were performed during the 2009 and 2010 / 2011 sampling or during the initial Exponent site characterization in 2001 and 2003.

The dredging proposed in the TCAO is estimated to remove approximately 143,000 cubic yards of contaminated sediments containing 141,000 kg (310,200 lbs.) of chemicals; including 2,200 kg arsenic; 170 kg cadmium; 8,700 kg chromium; 52,000 kg copper; 1,300 kg HPAHs; 15,000 kg lead; 230 kg mercury; 190 kg PCBs; 95 kg tributyltin; and 61,000 zinc (DTR Table 32-35). Natural attenuation proponents would need to demonstrate that physical, chemical, or biological processes would act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of these contaminants to levels that achieve the same benefits in reducing current impacts and future threats to beneficial uses the long term and within a time frame that is reasonable compared to the dredging identified in the TCAO.

The San Diego Water Board generally concurs with the comment that the potential for recontamination from off-site sources would affect all potential remedies and is therefore not a factor that should favor one potential remedy over another.

Additional discussion refuting MNA as a appropriate remedy is found in Response 1.1 at page 1-27, and Response 30.1.

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## RESPONSE 32.2

**DTR Section:** 32

**Comments Submitted By:** NASSCO, BAE Systems, Coastkeeper and EHC

**Comment IDs:** 75, 198, 199, 200, 325, 326, 327, 328, 429

**Comment**

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SD Coastkeeper and EHC commented that the narrative alternative cleanup levels for aquatic life cannot ensure that these beneficial uses will not be unreasonably affected at the Shipyard Sediment Site.

ID 75

The Order and DTR fail to include numeric clean-up levels for benthic invertebrates and fish. See MacDonald 2011 at 18-20. Instead the Order relies on a narrative directive to protect aquatic life. An example of a narrative directive is "Remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community." This failure is particularly egregious with respect to fish, as no information was presented in the Order or the DTR on how the potential for adverse effects on fish were explicitly considered. See MacDonald 2011 at 18 and 20. Furthermore, the lines of evidence developed to assess benthic invertebrate

communities are likely to be minimally protective as they rely on comparisons to a reference pool that included samples that would not meet criteria for negative control samples. See MacDonald 2011 at 19. Without appropriate numeric limits for fish and benthic invertebrates, there will be no way to quantitatively measure compliance with measures to protect fish and benthic invertebrates.

ID 325

In rebuttal, NASSCO commented that benthic invertebrate communities are protected by inclusion of “likely impacted” Triad stations in the proposed remedial footprint, and application of protective site-specific chemistry benchmarks (SS-MEQ and LAET), as well as additional safety buffers, to assess non-Triad stations. Moreover, a detailed statistical comparison of histopathology (i.e., incidence of lesions) in fish captured at the Site with reference area fish has already indicated that there are no significant adverse effects in Site fish as a result of observed chemistry concentrations.

ID 326

NASSCO also commented that, in fact, the TCAO and DTR are highly protective of both benthic invertebrates and fish. EHC/Coastkeeper relies primarily on the conclusions in the March 2011 MacDonald Report, which is currently subject to a motion for exclusion due to Mr. MacDonald’s unethical conduct during the discovery process (including destruction of evidence). Mr. MacDonald’s report acknowledges that “reliance on multiple lines of evidence is generally recommended for assessing contaminated sediments,” but claims that the cleanup levels are not protective of aquatic life based on several invalid criticisms, including:

- (1) SS-MEQ, which is the metric Mr. MacDonald refers to as being used to evaluate sediment chemistry data in the non-triad samples, is not effects-based;
- (2) the reference pool used to evaluate the results of the amphipod test is invalid because it included several survival values below 80%; and
- (3) reference pools for the bivalve and echinoderm toxicity tests were invalid because the bivalve reference pool included only four stations and the echinoderm reference pool included two samples with fertilization rates below 70%.

All three of these critiques are invalid. First, Mr. MacDonald’s assertion that SS-MEQ does not provide an effects-based tool for predicting adverse effects on benthic communities is incorrect, as the SS-MEQ was specifically developed to be a site-specific, effects-based assessment tool. It was developed using all six of the “likely” impaired stations that were found at the Site under the DTR’s effects-based triad analysis, and is therefore directly analogous to the manner in which Long, et al. (1995) developed ERM values. Further, the predictive reliability of SS-MEQ was evaluated, and a threshold of 0.9 selected, using the site-specific effects determinations for the 30 triad stations, as well as the five supplemental triad stations sampled at the Site. Accordingly, there is no scientific basis for asserting that SS-MEQ is not effects-based. Additionally, using SS-MEQ rather than SQGQ1 to assess impacts on benthic communities is justifiable because the SQGQ1 is based on generic sediment quality values that do not explicitly consider site-specific conditions, whereas SS-MEQ is based on chemical and biological data collected at the Site.

Second, Mr. MacDonald's criticisms of the reference pool as it relates to the amphipod toxicity test are unfounded. The reference pool for the Site was selected by the Regional Board to comply with EPA guidance, as well as methods commonly used by environmental practitioners in assessing sediment. Applicable guidance states that reference areas should reflect the habitat conditions and background levels of chemical contamination that would exist at a study site in the absence of site-related sediment contamination. Reference conditions should incorporate levels of chemical contamination or biological responses that are considered representative of the general conditions of a water body removed. Thus, the DTR appropriately sought to select reference areas "consistent with the San Diego Water Board's goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination." *Id.* If, as Mr. MacDonald suggests, reference stations with amphipod survival of less than 80% were excluded, the analysis would ignore the full range of responses that occur in valid reference areas in San Diego Bay, and bias the analysis to in favor of a pre-conceived notion concerning what the minimum level of survival in reference areas should be. Notably, sediment management standards from other jurisdictions recognize that amphipod survival in reference areas may be as low as 75%. See BAE Initial Comments (citing Washington State Sediment Management Standards (Ecology 1995); Phillips et al. (2001)).

Third, Mr. MacDonald's criticisms of the reference pools for the remaining toxicity tests are also unjustified. In addition to the above discussion concerning the selection of reference pools, the results of the DTR bivalve and echinoderm tests were the same as those found by Exponent, using a different reference pool and different statistical procedures (analysis of variance vs. reference envelope). Accordingly, these results demonstrate that the statistical results for both tests are robust, since they were the same under two different methods of analysis.

Lastly, Mr. MacDonald's criticisms focus on the toxicity results for reference stations to the exclusion of other factors involved in selection of the reference pool; however, additional information, such as chemistry and benthic community information, was also used to select the reference pool.

ID 327

NASSCO further commented that EHC/Coastkeeper erroneously stated that the TCAO and DTR provide no information concerning the potential for adverse effects on fish at the Site. However, the DTR contains detailed analyses assessing impacts to spotted sand bass, including fish histopathology analysis and PAH metabolite analysis in fish bile, as well as evaluations of chemistry data and indirect impacts to fish via the benthic community. As discussed in NASSCO's Initial Comments, empirical data were collected at the Site and evaluated for effects on spotted sand bass, and unacceptable risks were not found. The Regional Board also conducted an independent analysis, based on the data collected by Exponent, extensively evaluating the potential effects of sediment contamination on fish at the Site, and concluded that no effects could be conclusively attributed to contaminant exposure at the Site. Because no adverse effects on fish were detected, numeric cleanup levels for fish are not necessary. Moreover, even though there are no demonstrated adverse effects on fish, the TCAO conservatively requires remediation of "all areas determined to have sediment pollutant levels

likely to adversely affect the health of the benthic community,” which would also protect benthic fish.

NASSCO also agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 60.

ID 328

NASSCO continued its rebuttal stating that consistent with Water Code section 13304 and State Water Board Resolution, a reference pool should represent San Diego Bay conditions absent Shipyard Sediment Site discharges. That is, an appropriate reference pool for benthic community assessment should include all stressors and conditions that could affect the benthic community, with the exception of site-related chemical contamination. The DTR correctly states that the reference pool is intended to distinguish between pollution effects at the Site, and those found generally in the surrounding water body. Meeting criteria for negative laboratory controls is not a criterion for reference selection. The presence of all non-Site related stressors, including background chemical contamination, are part of the reference condition.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 59-60.

ID 429

BAE Systems provided the following rebuttal to SDC's and EHC's comment that “without appropriate numeric limits for fish and benthic invertebrates, there will be no way to quantitatively measure compliance with measures to protect fish and benthic invertebrates.”

The statement implies that sufficient information will not be collected in the post-remediation monitoring program to protect benthic macroinvertebrates and fish. As discussed previously, the monitoring program is comprised of multiple lines of evidence that address sediment chemical concentrations and potential biological effects. The evaluations of biological effects will include direct measurements of sediment toxicity (i.e., using the 10-day amphipod survival test with *Eohaustorius estuarius*, and the 48-hour bivalve larvae development test using the mussel *Mytilus galloprovincialis*) and bioaccumulation (i.e., using the 28-d test with the clam *Macoma nasuta*). In addition, sediment chemical concentrations will be compared with site-specific sediment quality values designed to be protective of benthic macroinvertebrate communities (i.e., the SS-MEQ and the 60% LAET values). The concerns for fish are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003).

ID 198

BAE Systems rebutted the following statement in MacDonald 2011. MacDonald states that “Without evidence in the record demonstrating that potential for adverse effects on fish were considered, I conclude that the Alternative Clean-Up Levels were developed without considering the potential for adverse impacts on fish.” This assertion is invalid since extensive evaluations of risks to fish were evaluated at the Site, using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). MacDonald’s assertion is therefore invalid.

ID 199

BAE Systems rebutted the following statement in MacDonald 2011. MacDonald states that “The metric for evaluating sediment chemistry data in the non-Triad samples is not effects based.” He then identifies the SS-MEQ as the metric he is referring too. However, as discussed in detail in the previous response to MacDonald’s Conclusion C.3.6, the SS-MEQ was developed in the DTR to be a site-specific, effects-based, protective tool for evaluating benthic impairment. MacDonald’s assertion is therefore invalid.

MacDonald also states the reference pool used to evaluate the results of the 10-d amphipod test was invalid because it included several survival values less than 80 percent. However, as discussed in detail in the previous response to MacDonald’s Comment C.2.6, the group of stations included in the reference pool was appropriate, because they were relatively uncontaminated and represented the range of sediment chemical concentrations and biological responses found in areas located away from contaminant sources in San Diego Bay. MacDonald’s assertion is therefore invalid.

MacDonald also states that the reference pools for the bivalve and echinoderm sediment toxicity tests were invalid because the bivalve reference pool included only four stations, and the echinoderm reference pool included two samples with fertilization rates of less than 70 percent. Aside from the justifications identified for the amphipod test above, the results for the bivalve and echinoderm tests identified in the DTR were identical to those found by Exponent (2003), using a different reference pool for the echinoderm test and a different statistical procedure for both tests (i.e., analysis of variance in the Exponent report and a reference-envelope approach in the DTR). That is, both studies found no significant effects for the echinoderm test, and significant effects at the same 12 stations for the bivalve tests. These results show that the statistical results for both of these tests were robust, since they were the same using two methods of analysis. MacDonald’s assertion that the results for those two tests were invalid is therefore incorrect.

ID 200

BAE Systems provided rebuttal to the following statement in MacDonald 2011. MacDonald states the “My analysis of data from the Shipyard Sediment Site indicates that benthic fish are at risk throughout portions of the site and at least seven polygons were not included in the Proposed Remedial Footprint that had unacceptable risks to fish (MacDonald 2009).” However, as describe in detail in the previous response to MacDonald’s Comment C.2.9, his analysis of risk to fish suffered from numerous flaws and uncertainties. Briefly, MacDonald predicted PCB concentrations in gobies, a species that does not occur at the Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, a lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above “assumptions” has uncertainties attached to it, which MacDonald (2009) did not acknowledge or attempt to quantify. By contrast with MacDonald’s hypothetical analysis of risk to fish, empirical data collected at the Site were evaluated for the spotted sand bass by Exponent (2003) and unacceptable risks were not found. MacDonald’s assertion regarding risks to fish at the Site is therefore invalid.”

### **Response 32.2**

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Coastkeeper, EHC and their retained expert, Donald McDonald, argue that the TCAO and DTR fail to include protective numeric clean-up levels for benthic invertebrates and fish and that there will be no way to quantitatively measure compliance with measures to protect fish and benthic invertebrates. Coastkeeper and EHC further argue that the DTR lines of evidence developed to assess benthic invertebrate communities are likely to be minimally protective as they rely on comparisons to a deficient DTR reference pool. In rebuttal, NASSCO argues that benthic invertebrate communities are protected under the terms of the TCAO by inclusion of all “likely impacted” Triad stations and Non-Triad stations exceeding protective site-specific chemistry benchmarks in the proposed remedial footprint. NASSCO also argues in rebuttal that the DTR reference pool was selected in conformance with U.S. EPA guidance and the requirements of Resolution 92-49, and is appropriate for use in establishing baseline conditions in terms of sediment chemistry, toxicity, and benthic community structure. NASSCO further contends that the concerns for fish are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on the extensive site-specific evaluation using the abundant and benthic-feeding spotted sand bass as the key indicator species. BAE Systems rebuttal supports NASSCO’s arguments and further points out that the TCAO and DTR monitoring program is sufficiently adequate to quantitatively measure compliance with measures to protect fish and benthic invertebrates.

#### **Benthic Community Protection**

The Cleanup Team concurs with NASSCO’s and BAE Systems rebuttal comments regarding the adequacy of the TCAO and DTR approach taken to ensure protection of benthic communities. Contrary to the assertions of San Diego Coastkeeper, EHC and their retained expert, McDonald, the TCAO and DTR approach to assessing benthic beneficial use impairment and targeting benthic impacted areas for remediation is reasonable, complete, scientifically supportable and fully adequate to ensure protection of benthic communities. The overall TCAO and DTR remediation approach to ensure protection of benthic communities consists of two key steps:

1. Evaluation of adverse effects to the benthic community at each of the 66 Shipyard Sediment Site stations using two different approaches depending on the types of data collected at the sample stations. The approaches are referred to as the Triad approach and the Non-Triad Approach; and
2. Targeting all polygonal areas having stations classified as “likely impaired” for inclusion in a remedial footprint that will be remediated to attain background concentrations derived in DTR Section 29. The term “likely impaired” is equated with impairment of the benthic community at a level assumed to represent aquatic life beneficial use impairment. The term “likely impaired” also refers to Non-Triad Stations exceeding site-specific chemistry benchmarks.

The Triad Approach summarized in TCAO Findings 16 and 18 and described in detail in DTR sections 16, 17 and 18 is based on a WOE framework for integrating sediment chemistry, toxicity, and benthic community data collected from surface sediment to make a station level determination of the likelihood of biological effects due to sediment contamination. This approach was used to evaluate the likelihood of sediment chemical-derived effects on the benthic

community at the 30 stations where data was collected for each of the three Triad lines of evidence. Six of the 30 Triad stations are classified as “Likely” for chemically-associated impairment (NA19, NA22, SW04, SW13, SW22, and SW23). All of the polygons represented by these stations are included in the proposed remedial footprint (See DTR Figure 33-1).

The Non-Triad Data Approach summarized in DTR 32.5.2 is based on an empirical evaluation of sediment contaminant concentrations at the 36 sample stations where toxicity and benthic community data was not collected. The approach consists of the evaluation of the five primary COCs (copper, mercury, HPAH, PCBs and TBT in surface sediments at the site using two chemical threshold referred to as 1) Site-Specific Lowest Apparent Effects Thresholds (LAETs) for individual COCs, and 2) Site-Specific Median Effects Quotient (SS-MEQ) to address combined effects of multiple COCs. Seven of the 36 Non-Triad stations are classified as “Likely” for chemically-associated impairment (SW01, SW05, SW10, SW16, SW20, SW24, and SW28). SW01, SW05, SW16, and SW20 were identified based on an exceedance of the SS-MEQ threshold. SW10, SW24, and SW28 were identified based on an exceedance of 60% of the LAET value for HPAHs (and exceedance of SS-MEQ threshold). (See DTR Table 32-23.) All of the polygons represented by these stations are included in the proposed remedial footprint (See DTR Figure 33-1).

The various empirical, consensus based and site derived SQGs used to support the Triad and Non-Triad data assessments are technically and scientifically sound, appropriately applied and well suited for overall assessment of potential biological effects. See San Diego Water Board response to Group Comment IDs 36, 68 and 77 for more details on the Triad and non-Triad WOE approaches, including specifics on the metrics SQGQ1, SS-MEQ, and 60% LAET.

Under the TCAO, all polygonal areas included in the remedial footprint are targeted for remediation to background sediment chemistry concentrations derived in DTR Section 29. (See DTR 33.1 and TCAO Directive 2.a. ) The proposed remedial action to attain background concentrations is dredging. Certain inaccessible or under-pier areas in the remedial footprint will be remediated by one or more methods other than dredging such as sand capping. Once remediation is completed, the SWAC within the remedial footprint is expected to be at or below background levels. Under Resolution No. 92-49, the cleanup of benthic impacted polygonal areas in the proposed remediation footprint to attain background conditions represents the complete removal of all waste that was 1) caused or permitted by the responsible parties identified in the TCAO to be discharged to the polygonal areas and 2) identified by inference as the likely cause of the sediment chemical-derived effects on the benthic community.

### **Cleanup Levels for Fish**

The Cleanup Team also concurs with NASSCO’s and BAE Systems rebuttal comments regarding the adequacy of the extensive investigation documented in the DTR Appendix for Section 15, (See A15.2 Fish Histopathology Analysis and A15.3 Fish Bile Analysis) to examine adverse effects to fish attributable to contaminant exposure at the Shipyard Sediment Site. As documented in the DTR, adverse effects to fish from Shipyard Sediment Site chemicals were not identified. The detailed statistical comparison of histopathology (i.e., incidence of lesions) in fish captured at the Site with reference area fish contained in the DTR Appendix for Section 15 demonstrates that there are no significant adverse effects in Site fish that can be conclusively



attributed to contaminant exposure at the Shipyard Sediment Site. The Cleanup Team concurs with NASSCO's rebuttal that because no adverse effects on fish were detected, numeric cleanup levels for fish are not necessary. NASSCO also correctly points out that even though there are no demonstrated adverse effects on fish, the TCAO conservatively requires remediation of "all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community," which would also protect benthic fish.

### **Reference Pool**

McDonald (2001) also argues that the reference pool used to evaluate the results of the 10-day amphipod test was invalid because it included several survival values less than 80 percent. The Cleanup Team agrees with NASSCO and BAE Systems rebuttals to these comments. The TCAO Final Reference Pool described in DTR Section 17 is consistent with the San Diego Water Board's goal of establishing a reference condition that represents 1) contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and 2) some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination. (DTR Section 17 at Page 17-7). The reference pool was selected in conformance with applicable U.S. EPA guidance and the requirements of Resolution No. 92-49 pertaining to the establishment of background levels to define water quality conditions that existed before the discharge.

If amphipod survival of less than 80 percent were excluded from the reference pool, the analysis would ignore valid reference areas data in San Diego Bay indicating biological effects which are reflective of the natural variability in toxicity and benthic conditions that can occur from factors other than sediment contamination. Benthic community composition for example can be affected by stress factors that are not contaminant induced such as natural variations in habitat (e.g. sediment grain size and organic content) environmental factors (e.g. water depth, salinity, and temperature) and physical disturbance (e.g. anchor or prop wash). Measurements of sediment toxicity can also be influenced by variety of factors besides sediment contamination such as test imprecision, and the presence of natural factors such as hydrogen sulfide or ammonia. Sediment toxicity test results may also not have a consistent correlation with biological effects because the toxicity test species and species that compose the benthic communities may have different sensitivities to different contaminants. As NASSCO points out in their rebuttal the exclusion of stations exhibiting amphipod survival of less than 80 percent would inappropriately bias the analysis in favor of a pre-conceived notion concerning what the minimum level of survival in reference areas should be. All of these considerations are described in further detail in DTR section 17.2.

McDonald (2011) also argues that the reference pools for the bivalve and echinoderm sediment toxicity tests were invalid because the bivalve reference pool included only four stations, and the echinoderm reference pool included two samples with fertilization rates of less than 70 percent. This criticism of the reference pools is unfounded and the Cleanup Team concurs with NASSCO's and BAEs rebuttals on this issue. Aside from the justifications identified for the amphipod test above, the results for the bivalve and echinoderm tests identified in the DTR were identical to those found by Exponent (2003; as provided in the report, *NASSCO and Southwest Marine Detailed Sediment Investigation, September 2003* ;SAR105413, SAR1054127, SAR105997, and SAR106283 ), using a different reference pool for the echinoderm test and a

different statistical procedure for both tests (i.e., analysis of variance in the Exponent report and a reference-envelope approach in the DTR). As BAE Systems points out in their rebuttal, both studies found no significant effects for the echinoderm test, and significant effects at the same 12 stations for the bivalve tests. These results show that the statistical results for both of these tests were robust, since they were the same using two methods of analysis.

### **Post Remediation Monitoring**

Coastkeeper and EHC make the statement in their comments that without appropriate numeric limits for fish and benthic invertebrates, there will be no way to quantitatively measure compliance with measures to protect fish and benthic invertebrates. BAE points out in their rebuttal that this statement incorrectly implies that sufficient information will not be collected in the post-remediation monitoring program to protect benthic macroinvertebrates and fish. As discussed in the Cleanup Team's responses to comments on Finding 34, the post remediation monitoring program is comprised of multiple lines of evidence that address sediment chemical concentrations and potential biological effects. The monitoring program is adequately designed to evaluate whether TCAO remediation goals described in TCAO Directive 3 are met and maintained over the long term. Post remediation monitoring will be initiated two years after remedy implementation has been completed and continue for a period of up to 10 years after remediation. The post remedial monitoring includes direct measurements of sediment chemistry, sediment toxicity, and bioaccumulation (i.e., using the 28-d test with the clam *Macoma nasuta*). Benthic community condition assessments will also be conducted to evaluate the overall impact of remediation on the benthic community re-colonization activities.

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## **RESPONSE 32.3**

**DTR Section:** 32

**Comments Submitted By:** BAE Systems, Coastkeeper and EHC

**Comment IDs:** 202, 483, 484

### **Comment**

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ID 483

Coastkeeper and EHC commented that the TCAO contains incorrect statements including the following. Finding 32 of the TCAO incorrectly concludes that "clean-up of the remedial footprint will restore any injury, destruction, or loss of natural resources." The San Diego Regional Board does not have authority to conduct natural resource damage assessments because only the Natural Resources Trustees have authority to conduct natural resource damage assessments and to draw conclusions regarding injury to natural resources and the effectiveness of remedial actions in terms of restoring natural resource values. (See MacDonald 2011 at p. 20).

ID 202, 484

In rebuttal, BAE Systems commented that this statement is an unwarranted extrapolation of a single mention of "natural resources" in the TCAO, in which it is simply stated that "Cleanup of the remedial footprint will restore any injury, destruction, or loss of natural resources." The statement in no way addresses service losses, monetary damages, or any of the other parameters unique to natural resource damage assessments. The statement simply articulates that the cleanup of the remedial footprint at the Shipyard Site will improve environmental conditions

such that natural resources like those evaluated in detail at the Shipyard Site (i.e., benthic macroinvertebrates, fish, and aquatic dependent wildlife) will benefit. The SDC/EHC statement is therefore irrelevant.

### **Response 32.3**

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BAE Systems is correct in its characterization of the TCAO. The text in the TCAO Finding 32 supports the conclusion that the alternative cleanup levels will not unreasonably affect present and anticipated beneficial uses of the site. It was not meant to imply that the San Diego Water Board had conducted a natural resource damage assessment within the meaning of the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or the Oil Pollution Act (OPA). The San Diego Water Board does have statutory authority to consider a variety of factors, including damages to aquatic life and aquatic dependent wildlife beneficial uses, in assessing whether alternative cleanup levels are sufficiently protective. ( See Water Code section 13304, Resolution No. 92-49, and CRC Title 23, section 2550.4(e). No change to Finding 32 of the TCAO is warranted. (See also Response 1.4)

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### **RESPONSE 32.4**

**DTR Section:** 32

**Comments Submitted By:** Coastkeeper and EHC

**Comment IDs:** 60

#### **Comment**

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III.A. The Site-Wide Alternative Cleanup Levels Were Calculated Based on Remediating to Background Pollutant Levels.

The DTR admits that "Post-remedial SWAC calculations were completed with the assumption that the SWAC inside the [Proposed Remedial] footprint would be remediated to background concentrations...." DTR §32.2.3 at 32-12; see also Table A32-3. By the DTR's own admission, in order to achieve the post-remedial pollutant concentrations site-wide, the remediated areas need to be cleaned to background if the other areas remain untouched. For this approach to be valid, the cleanup must ensure that remediated areas are cleaned to background conditions or cleaner.

### **Response 32.4**

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It is correct that post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint would be remediated to the background UPL concentrations derived in DTR Section 29. However, it should be noted that in reality, the SWAC within the remediation footprint following remediation may well be less than the background UPL concentrations, or result in chemical concentrations below background in certain areas. (See DTR Section 32.2.3 at Page 32-12 and DTR Section 33.1 at Page 33-2.)

In order to complete the Post- Remedial SWAC calculations, it is necessary to assume an average COC concentration for the remediated area. The assumption of background UPL concentrations in the calculations incorporates conservatism in the analysis and results in a Post-Remedial SWAC result that is more beneficial use protective. It should be pointed out that the Shipyard Sediment Site site data clearly indicates that individual COC concentrations below the

background UPL currently exist at the Shipyard Sediment Site, which suggests that the Post Remedial SWAC concentrations are likely to be even lower following remediation than projected in the calculations. (See DTR Appendix for Section 32, Table A32-1 and Table A 32-2.)

Accordingly the polygonal areas included in the remedial footprint need to be remediated to attain background concentrations derived in DTR Section 29 in order to achieve the predicted post-remedial SWACs shown in DTR Table 32-3 and TCAO Directive 2.c.. To ensure this, the TCAO Directive A.2.a. requires that the sediments in the remedial footprint be dredged to attain background conditions and confirmed by remediation monitoring results.. If the concentrations in the dredge remedial areas do not meet these TCAO directives, additional dredging will be required under TCAO Directive 2.a.. The TCAO Directive D. Post Remedial Monitoring requires sampling that confirms that the post-remedial SWAC is achieved.

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### RESPONSE 32.5

**DTR Section:** 32

**Comments Submitted By:** BAE Systems

**Comment IDs:** 177

**Comment**

BAE's responses to conclusions in MacDonald (2011) regarding the proposed remedial footprint.

The methods used in the DTR to evaluate sediment at the Site were selected in large part to be consistent with those recommended by EPA, as well as those commonly used to evaluate contaminated sediment sites in the U.S. by sediment quality practitioners. Conclusion C.3.3 of MacDonald 3/11/11 Expert Report states that "Evaluating risks to benthic invertebrates using a sediment quality triad (SQT) approach is a scientifically valid approach." "The procedures described in the DTR for interpreting such data are not always consistent with the best current guidance."

This conclusion is invalid, as described in detail in the responses to MacDonald's Comments C.2.4, C.2.5, and C.2.6. The methods used for the Site are consistent with EPA guidance and with the methods commonly used at contaminated sediment sites. In addition, they are both conservative and protective of benthic macroinvertebrate communities at the site.

**Response 32.5**

Comment Noted.

The Cleanup Team examined the Section C.3.3 of the MacDonald report (2011) in an attempt to determine the "best current guidance" MacDonald is referring to for comparison to the approach taken in the DTR. According to Section C.3.3 and C.3.5 of the MacDonald report, the data was not evaluated with the best guidance according to the "Science Advisory Group on Sediment Quality Assessment," citing MacDonald et al. 2009 for additional information. The reference 2009 document, entitled "Development and evaluation of sediment and pore-water toxicity thresholds to support sediment quality assessments in the Tri-State Mining District (TSMD), Missouri, Oklahoma, Kansas" is cited as a draft report submitted to U.S. EPA Regions 6 and 7. The Cleanup Team was unable to locate the document and, as a draft report, its level of peer

review is unknown. It is also unclear how the document, which appears to focus on landlocked systems, pertains to the San Diego Bay Shipyard Site. The Cleanup Team was also unable to locate any information on the "Science Advisory Group on Sediment Quality Assessment."

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## RESPONSE 32.6

**DTR Section:** 32

**Comments Submitted By:** BAE Systems

**Comment IDs:** 193

**Comment**

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Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

MacDonald argues the "appropriateness and protectiveness of the Alternative Clean-Up Levels described in Section 32 of the TCAO and Finding 32 of the DTR are uncertain for several reasons" and proceeds to set forth comments. (Id.) BAE Systems responds to each comment.

1. Comment D.2.1 that "The Alternative Clean-Up Levels are substantially higher than background levels of the primary COCs in San Diego Bay" is Unsupported and Invalid (TCAO Finding 32; DTR § 32)

MacDonald states that "Clean-Up Levels that correspond with background conditions in San Diego Bay would provide the highest, practically achievable, level of protection to ecological receptors utilizing habitats in the vicinity of the Shipyard Sediment Site." However, because he fails to evaluate or even define his term "practically achievable", he provides no support for his assertion. By contrast the DTR provided extensive evaluations of both the protectiveness of the Alternative Cleanup Levels, as well as the technical and economic feasibility of cleaning up the entire site to background levels.

As stated in Section 32.2.3 of the DTR, "Protectiveness of the beneficial uses represented by aquatic-dependent wildlife and human health was assessed via estimation of post-remedial SWAC values of the remedial footprint. Post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint would be remediated to background concentrations." The protectiveness of this approach for aquatic dependent wildlife was then evaluated, and it was concluded that "HQs for all receptors evaluated at the Site had a value less than 1.0 (Table 32-8), indicating that the COCs are unlikely to cause adverse ecological effects and that the post-remedial sediment chemistry conditions are protective of aquatic dependent wildlife and their associated beneficial uses." In addition, in Section 31 of the DTR, it was determined that "Based on these incremental costs versus incremental benefit comparisons, cleanup to background sediment quality levels is not economically feasible." Based on the considerations discussed above, the SWAC values identified in Section 32 of the DTR were selected as the Alternative Cleanup Levels for the Site (see Table 2 of the TCAO). It therefore is appropriate that the Alternative Cleanup Levels exceed background values, and MacDonald's assertion is invalid.

**Response 32.6**

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The San Diego Water Board concurs with comment that the post-remedial SWAC identified in the DTR is appropriate and protective of aquatic-dependent wildlife. The San Diego Water Board also concurs with the comment that, based on the economic evaluation in the DTR, it is economically infeasible to cleanup to background.

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### **33. TCAO Finding 33 and DTR Section 33: Proposed Remedial Footprint and Preliminary Remedial Design**

Finding 33 of TCAO No. R9-2011-0001 states:

Polygonal areas were developed around the sampling stations at the Shipyard Sediment Site using the Thiessen Polygon method to facilitate the development of the remedial footprint. The polygons targeted for remediation are shown in red and green in Attachment 2. The red areas are where the proposed remedial action is dredging. The areas shown in green represent inaccessible or under-pier areas that will be remediated by one or more methods other than dredging. Portions of polygons NA20, NA21, and NA22 as shown in Attachment 2 were omitted from this analysis because it falls within an area that is being evaluated as part of the TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas Creek TMDL and is not considered part of the Shipyard Sediment Site for purposes of the CAO.

The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentration for the five primary COCs, Site-Specific Median Effects Quotient (SS-MEQ)<sup>21</sup> for non-Triad stations, and highest concentration of individual primary COCs. Based on these rankings, polygons were selected for remediation on a “worst first” basis.

In recognition of the methodologies and limitations of traditional mechanical dredging, the irregular polygons were converted into uniform dredge units. Each dredge unit (sediment management unit or “SMU”) was then used to develop the dredge footprint. The conversion from irregular polygons to SMUs is shown in Attachments 3 and 4. These attachments show the remedial footprint, inclusive of areas to be dredged (“dredge remedial area,” in red) and under-pier areas (“under-pier remedial area,” in green) to be remediated by other means, most likely by sand cover. Together, the dredge remedial area and the under-pier remedial area constitute the remedial footprint.

Upland source control measures in the watershed of municipal separate storm sewer system outfall SW-4 are also needed to eliminate ongoing contamination from this source, if any, and ensure that recontamination of cleaned up areas of the Shipyard Sediment Site from this source does not occur.

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#### **RESPONSE 33.1**

**DTR Section:** 33

**Comments Submitted By:** Coastkeeper and EHC, NASSCO, BAE Systems, Port District

**Comment IDs:** 74, 76, 77, 141, 146, 149, 170, 174, 175, 176, 180, 181, 183, 329, 330, 331, 332, 333, 334, 408, 409, 430, 471, 480

**Comment**

ID 74, 76

Coastkeeper and EHC commented that the law requires every cleanup to result in the "best water quality reasonable." See Resolution No. 92-49. The following aspects of the proposed cleanup prevent it from achieving the "best water quality reasonable." The Proposed Remedial Footprint indicating "polygons targeted for remediation" is too small to ensure that present and anticipated

beneficial uses of San Diego Bay are protected. See Order at 38, Attachment 2. Problems with the development of the proposed remedial footprint results in a cleanup less than the best water quality reasonable based. This comment is based on five reasons presented below.

ID 77

Coastkeeper and EHC stated that, first, an insufficient number of samples were collected to accurately determine the nature and extent of contamination at the 148-acre Shipyard Site, given the variability of contaminants at the site. See MacDonald (2011) at p. 10.

ID 141, 175, 430

In rebuttal BAE Systems commented that Coastkeeper's and EHC's assertion on the number of sampling stations and their distribution is incorrect. The station distribution scheme was consistent with the manner in which most schemes are designed at contaminated sediment sites. That is, stations are distributed with the highest density near sources where the highest COC concentrations are expected (especially in depositional environments), and with lower densities in areas removed from the sources, where contaminants are expected to be more widely dispersed by waves and currents. At the Shipyard Site, it was expected that most contaminant sources would be located near the shoreline, and that the piers would create depositional environments that would facilitate deposition of contaminants near the sources, resulting in patchy distributions with elevated concentrations. In contrast, contaminant sources were not expected to be found outside the pier lines, and in those locations, contaminants would be dispersed by waves and currents in San Diego Bay, and their concentrations in sediments would be lower and more evenly distributed. Therefore, most of the 65 stations (i.e., 43) at the Shipyard Site were located within the pier line of the site, and the station distribution scheme was consistent with the scheme commonly used at contaminated sediment sites.

Moreover, the sediment chemistry results of the 2001/2002 sampling at the Shipyard Site confirmed the assumptions used to design the station distribution scheme. That is, the chemical concentrations presented in Table A33-3 of the DTR and the concentration contours presented in Figures 4-3 to 4-21 of Exponent (2003) show that the highest concentrations were generally found within the pier line and lower, more evenly distributed concentrations were found outside the pier line. Therefore, the station distribution scheme used at the Shipyard site is considered adequate to characterize the nature and extent of sediment contamination.

Because there are no firm rules or agency guidance on the number of stations that should be sampled at a contaminated sediment site (i.e., because each site is different), the number used to characterize a particular site is usually determined using the best professional judgment of the scientists, regulatory staff, and responsible parties involved with site. These decisions take into account the site-specific nature of sources and transport mechanisms, and the effort and costs involved in both the site investigation and potential cleanup actions. Because this was the process used to develop the station distribution scheme for the Shipyard Site, the station densities are considered adequate to characterize the nature and extent of sediment contamination, and to develop a remedial footprint.



ID 331

In rebuttal, NASSCO agreed with BAE's comments on the topic of "insufficient number of samples," and incorporated BAE's comments in its comments. (See BAE Initial Comments, at 30.) NASSCO commented that the sediment investigation by Exponent, upon which the DTR analyses are based, was conducted with substantial oversight from the Regional Board and has been described by Regional Board Staff ("Staff") as "the most extensive sediment investigation ever conducted for a site in San Diego Bay," if not California. (Barker Depo, at 80:2 – 80:22; 82:3 – 82:4, 83:14 – 83:23). See also DTR, at 13-2 – 13-3 (summarizing Staff and stakeholder involvement in the sediment investigation); Exponent Report, at 1-2 – 1-4 (summarizing the directives and guidance provided by Staff throughout the planning and execution of the sediment investigation and Exponent Report). Staff confirmed that approximately 65 stations were sampled, including 30 triad stations, 35 non-triad stations, with sediment chemistry and benthic community profiling data collected. Barker Depo, at 80:2 – 80:22. Staff did not recall collecting 30 or more triad stations for any other sediment matter in San Diego Bay. Id. Further, Staff described the study as "detailed" and "very thorough." Id., at 82:3 – 82:4, 82:14 – 83:23.

The Site assessment approach, including the sample types, number, and density were all thoroughly vetted by Board Staff prior to implementation in 2001. The DTR analyzes data collected from 60 stations throughout the Site, distributed consistent with the manner in which most investigations are designed at sediment sites. Stations were distributed with the highest density near sources where the highest COC concentrations would be expected, and with lower densities in areas further removed from potential sources, where contaminants would be expected to be more widely dispersed by winds, waves, and tides. In fact, Mr. MacDonald described exactly this type of distribution scheme when he suggested that "to address concerns regarding spatial variability in sediment chemistry, investigators frequently design sediment sampling programs to provide a high density of samples in the vicinity of point sources discharges." March 2011 MacDonald Report, at 10. Given the extensive and unparalleled scope of the sediment investigation, including the number of stations sampled, the contention that an insufficient number of stations were analyzed is unsupported.

ID 471

Coastkeeper and EHC provided rebuttal to BAE Systems' comments on MacDonald 2011 as follows.

BAE's lawyers found fault with every point Don MacDonald made in his expert report, dated March 11, 2011 and deemed each expert opinion "incorrect," "invalid," "unsupported" or "premature." However, BAE's criticisms are solely argument, as they rely on unsupported assertions made by lawyers, not on measured points provided by an equally-qualified expert. After examining the particular criticisms, it is clear that they are without merit and provided merely in an attempt to confuse the Regional Board. For these reasons, BAE's criticisms of Donald MacDonald's expert opinions carry little weight and should be ignored.

Regarding the issue of sampling density, Coastkeeper and EHC stated that BAE's lawyers claim that Mr. MacDonald's expert opinion that "the sampling density is insufficient to accurately characterize the nature and extent of contamination at the site" is "incorrect." They base this claim on an unsupported and un-cited assertion that sampling was "consistent with the manner in

which most schemes are designed at contaminated sites.” But BAE’s lawyers provide no citations or examples to demonstrate that “most schemes” are designed with such a paltry sampling density, nor can they explain how an opinion about a subjective matter like “sufficiency” can be “incorrect.”

ID 77

Coastkeeper's and EHC's second assertion is that ranking the polygons from most- to least-contaminated using the Composite SWAC value fails to consider the potential adverse effects on human health or the environment. See MacDonald 2011 at 10. The method also ignores concentrations of other contaminants—such as lead, zinc, and low molecular weight PAHs—that could be elevated in sediments from the site. See MacDonald 2011 at 10.

ID 430

BAE Systems and NASSCO provided the following rebuttal to Coastkeeper and EHC's second assertion. BAE Systems commented that the first assertion is invalid because, as described in Section 33.1.2 of the DTR, the composite SWACs were based on all five primary COCs at each station. The composite values therefore provided quantitative estimates of the degree of chemical contamination at all Shipyard stations, which allowed the stations to be ranked with respect to the magnitude of risks that they posed to human health and the environment on the basis of chemical contamination. The second assertion made by SDC and EHC is invalid because, as described in Section 29.3 of the DTR, the secondary COCs at the Shipyard site generally exhibited strong positive correlations with one or more of the primary COCs, indicating that they would be addressed in a common remedial footprint. Therefore, the co-occurrence evaluation conducted in the DTR ensured that the secondary COCs were accounted for in the remedial footprint.

ID 332

NASSCO agreed with BAE’s comments on the topic of ranking polygons from most- to least-contaminated using the composite SWAC value and incorporated those comments in its comments. (See BAE Initial Comments, at 31-32). Further, NASSCO stated that Coastkeeper's and EHC's contention that the polygon ranking approach fails to consider the potential adverse effects on human health or the environment is an unsupported conclusion. Coastkeeper and EHC cite to MacDonald who reiterates the same unsupported conclusion. EHC/Coastkeeper has provided no credible evidence that the proposed TCAO is not protective of human health or the environment.

ID 480

In rebuttal to Coastkeeper's and EHC's second assertion, the Port District commented that it is supportive of the proposed cleanup approach reflected in the TCAO and DTR, while reserving the right to consider any comments that may come in during the public comment period. According to Regional Board Executive Officer and CUT team head, David Gibson, this is exactly the type of support which the CUT is seeking and would expect from the Port. (Exhibit " 1 " [Gibson Deposition], 43:4-22.)

To illustrate this support, the Port's designated expert, Dr. Michael Johns, provides support for the proposed remedial footprint. (Exhibit "2" [Port Expert Designation]; Exhibit "3" [Dr. Johns

Declaration], paragraphs 8-9.) In particular, Dr. Johns agrees with the process used to identify the polygons for the remedial footprint and has concluded that the factors used to select "worst first" polygons are consistent with the findings.

Dr. Johns cited two caveats to his opinion that the remedial footprint contemplated by the DTR will adequately address risks posed by contaminated sediments within the Site in accordance with the Water Board's responsibility to protect the beneficial uses of waters of the state pursuant to California Water Code section 13304. Those caveats are:

- a. Polygon SW29 - Only a portion of this polygon was included in the proposed remedial action footprint; the remaining area will be the subject subsequent action by the Water Board. Having reviewed additional data collected from within the boundaries of the SW29 polygon (i.e., split sample data from the samples collected by SDG&E under Order No. R9-2004-0026), I found that total PCB concentrations measured in samples represent some of the highest found within the Site. In addition polygon SW29 is at the edge of the study area and represents an unbounded area of higher concentrations of total PCBs. Because of these factors (i.e., high PCB concentrations not bounded by sediment data showing lower concentrations), the portion of polygon SW29 not currently included in the remedial footprint warrants subsequent action.
- b. Polygon NA23 -The DTR acknowledges the high ranking of this polygon using the "worst first" analysis but concludes that it is technically infeasible to dredge because doing so would adversely affect Pier 12, the tug boat pier, and the riprap shoreline, as well as undermine the sediment slope for the floating dry dock sump. However, other areas in which dredging is not feasible are currently included in the remedial action footprint. Alternative remedial technologies proposed in these latter areas include capping and backfill. The constraints that precluded dredging in polygon NA23 (e.g., inaccessibility of sediment under piers) appear to have been overcome for these other areas. Therefore, the decision not to include polygon NA23 in the remedial action footprint on the basis of technical feasibility should be re-evaluated.

ID 409

NASSCO provided the following rebuttal to the Port District's Exhibit "3" [Dr. Johns' Declaration].

Dr. Johns' comment with respect to polygon SW29 suggests that remedial action should occur at all areas of polygon SW29 not included in the DTR remedial footprint due to PCB concentrations that are "...some of the highest found within the Site" and because the polygon is near the edge of the study area. However, he presents no analysis that suggests the proposed remedial footprint is insufficient to protect beneficial uses, nor does he explicitly assert that PCBs (or any other COC) concentrations at polygon SW29 pose an unacceptable risk or beneficial use impairment that requires remediation to mitigate. He apparently is suggesting that the remedial footprint be expanded solely on the basis of relative chemistry – only one leg of the triad analysis – and not on the basis of biological effects or receptor exposure. The spatially-weighted average exposure approach for assessing food web risks, and the weight of evidence approach for assessing risk to aquatic life, both of which Dr. Johns apparently agrees with,

support the protectiveness of the DTR proposed remedial footprint, even given the extreme assumptions of the DTR exposure analyses for humans and wildlife.

Furthermore, Dr. Johns' comment with respect to polygon NA23 appears to be premised on the notion that "inaccessibility of sediment under piers" is the primary reason why dredging is infeasible at polygon NA23.

In fact, remediation of polygon NA23 is significantly more problematic than the remediation of other polygons, including those where sediment is inaccessible due to the presence of an overwater pier, due to the unique combination of conditions at NA23.

Specifically, NA23 is comprised largely of steep and lengthy slopes, which are located immediately adjacent to the pile-supported structure of Pier 12 and the armored shoreline, and which leave little to no room in which to establish a stabilizing offset distance. NASSCO's Initial Comments, Attachment D, Anchor QEA Technical Memorandum at 2 (May 26, 2011). These sloping areas are inclined at up to approximately 3H:1V (close to the sediment's natural angle of repose) and encompass 30 to 40 feet of vertical relief, making them among the steepest and highest in relief of any slopes at the shipyard site. *Id.* In such situations, dredging on any part of the slope must be accompanied by dredging to a similar extent all the way up the slope in order to maintain overall slope stability; otherwise, undredged areas higher up would quickly collapse into dredged areas below. *Id.* at 2-3.

However, since the upper portions of the slopes at NA23 are adjacent to Pier 12 and the armored shoreline slope, removal of material would lessen the stability of these features, and necessitate significant structural improvements to prevent catastrophic collapse of these features. *Id.* at 2-3. Elsewhere on the project site, such a scenario can be mitigated by installing a rock buttress alongside the structure of slope, so that it will be less likely to be undermined or weakened. *Id.* at 3. At polygon NA23, however, there is limited to no room in which to add such a feature, and in any event, situating one at the top of a dredged slope would be inherently unstable due to the fact that there is insufficient room to maintain a stabilizing offset distance. *Id.*

Thus, the unique set of conditions found at NA23, including the (1) steep slopes, (2) presence of adjoining features, and (3) limited ability to counteract the destabilizing influence of dredging along those features, renders remediation of NA23 technically infeasible.

Finally, Dr. Johns provides no biological or risk basis for concluding that NA23 should be added to the remediation footprint. The available data for Station NA23 suggest the opposite in fact (see summary below). Based on relatively low chemistry, and the lack of toxicity, benthic impacts from sediment contamination at NA23 are not considered likely. This area is known to be periodically disturbed by raising and lowering of the large floating dry dock, and it is likely that the single benthic community indicator that was outside reference conditions (total abundance) is due to physical disturbance. Accordingly, NA23 was properly excluded from the proposed remedial footprint in the DTR.

ID 77

Coastkeeper's and EHC's third assertion is that the Proposed Remedial Footprint arbitrarily excludes 15 polygons that are more contaminated—from a sediment chemistry standpoint—than the least-contaminated polygon in the Proposed Remedial Footprint. See MacDonald 2011 at 11.

ID 146,170, 181, 430

BAE Systems provided the following rebuttal regarding Coastkeeper's and EHC's third assertion. BAE Systems commented that although SDC and EHC (2011) did not identify the 15 polygons referred to in the statement, they refer to MacDonald (2011), in which the 15 polygons were those with Composite SWAC Ranking Values greater than 5.5. SDC and EHC's assertion is invalid, however, because the DTR clearly states on Page 33-1 that, "The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentrations for the five primary COCs, site-specific median effects quotient (SS-MEQ) for non-Triad stations, and highest concentration of individual primary COCs". Therefore, the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. As shown in Table 33-1 of the DTR, the 23 polygons with the highest Composite SWAC Ranking Values were included in the remedial footprint (see third column of the table), and all of those polygons had values of 7.6 or greater. Polygon NA09 was added to this group primarily because it had the 10th highest concentration of mercury (i.e., a primary COC) of all the polygons (see Table 33-4 of the DTR). Therefore, the SWAC Value of 5.5 was not the primary line of evidence used to include Polygon NA09 in the remedial footprint, and a SWAC Value of 5.5 was not used as a standalone justification for including any polygon in the remedial footprint, as MacDonald (2011) implied. SDC and EHC's assertion is therefore invalid.

BAE also had the following related comments on MacDonald 2011. MacDonald also states that the HPAH concentration of Polygon NA07 was listed as 15.85 mg/kg in Table A33-3 of the DTR, that this value exceeds the 60% LAET value of 15.3 mg/kg, and that, as a consequence, the rationale for excluding that polygon from the remedial footprint is based on all COCs being less than 60% LAET values (Table 33-6 of the DTR) is incorrect. MacDonald's statement that the HPAH value for Polygon NA07 is 15.85 mg/kg is correct, and Table 33-6 is, therefore, in error. Nevertheless, the Triad results indicate that NA07 is not likely impaired, with low sediment toxicity and low benthic community effects being found (see Table 33-6 of the DTR). Therefore, it is likely that the bioavailability of the HPAHs are reduced at this location, and the empirical biological results should be given more weight than the bulk sediment chemistry results when deciding whether to include this polygon in the remedial footprint. The decision to not include this polygon in the footprint is therefore justified.

Although MacDonald states that benthic macroinvertebrate data for Polygon NA07 was not included in the database he was provided, benthic data are available for this polygon (see Table 18-1 of the DTR).

ID 183

In rebuttal, BAE Systems also commented that MacDonald 2011 provided no technical basis for the assertion that "the proposed remedial footprint excludes polygons, like NA07, with concentrations of contaminants in sediment that likely pose higher risks to human health and

aquatic-dependent wildlife than some of the polygons included in the Proposed Remedial Footprint."

ID 329, 333

NASSCO agreed with BAE System's comment above and incorporated it into NASSCO's comments. NASSCO also commented that the size of the remedial footprint is irrelevant to the assessment of beneficial uses or remediation to mitigate beneficial use impairment. The only relevant consideration is whether residual sediment chemicals are protective of beneficial uses, as determined by exposure assessment on an appropriate spatial scale. At many sites, remedial goals can be achieved through the selective removal of hot spot contamination. Further, there is ample evidence set forth in NASSCO's Initial Comments demonstrating that the cleanup is excessively conservative, and that site conditions do not warrant any remediation beyond monitored natural attenuation, which is already occurring.

ID 471

Coastkeeper and EHC provided the following comment on BAE System's criticism of MacDonald 2011. BAE's lawyers characterize Mr. MacDonald's conclusion that the proposed remedial footprint "excludes polygons with composite SWAC ranking values greater than 5.5" as "invalid." But the record clearly shows that the lowest SWAC ranking value included in the footprint was 5.5 and that 15 polygons with SWAC ranking values greater than 5.5 were not included in the footprint. That BAE's lawyers characterize an accurate factual summary as an "invalid" conclusion reveals their argument as nonsensical and unconvincing.

Further, BAE's lawyers claim that Mr. MacDonald provided "no technical basis" for his assertion that the proposed remedial footprint "excludes polygons, like NA07, with concentrations of contaminants in sediment that likely pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the proposed remedial footprint." BAE either ignores or fails to understand that Table 1 of Mr. MacDonald's expert report sets forth the technical basis for his conclusion that the proposed remedial footprint exclude polygons that pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the proposed remedial footprint. See Expert Report of Donald MacDonald dated March 11, 2011 at Table 1.

ID 77

Coastkeeper's and EHC's fourth assertion is that the thresholds the DTR uses to determine whether polygons that are "Likely" impacted are problematic. The DTR fails to explain why the SS-MEQ is used to evaluate sediment chemistry in the non-Triad sediment samples, when the metric used for the Triad sediment samples (SQGQI) is reliable. See MacDonald 2011 at 19. The DTR and record provide no evidence demonstrating how or why 0.9 was chosen as the "optimal threshold." DTR § 32.5.2 at 32-32; See MacDonald 2011 at 11. Likewise, the 60% Lowest Apparent Effects Threshold for classifying sediment samples as "Likely" impacted is too high. See MacDonald 2011 at 11-13; See DTR § 32 at Table 32-19.

ID 180, 146, 149, 430

In rebuttal to Coastkeeper's and EHC's fourth assertion, BAE Systems commented that the SS-MEQ was specifically developed to be an environmentally protective site-specific predictor of

both non-likely and likely impairment at the Shipyard Site. The switch from the SQG1 to the SS-MEQ was therefore justified because the SQG1 values are generic guidelines that do not explicitly consider the site-specific conditions at the Shipyard Site. By contrast, the SS-MEQ was based exclusively on chemical and biological data collected at the site and therefore is a more appropriate site-specific sediment assessment tool than the SQG1.

The methods used to develop and evaluate the SS-MEQ are clearly described in the text of Section 32.5.2 of the DTR, and all of the related underlying data are presented in Table A32-11 of the DTR. As noted in the DTR, a threshold value of 0.9 had an overall reliability of 70 percent. In addition, the other measures of predictive reliability of the SS-MEQ threshold of 0.9 presented in Tables 32-21 and A32-11 of the DTR show that the threshold is biased toward being environmentally protective. That is, its ability to accurately predict locations that are not likely impaired (referred to as non-likely efficiency in Table A32-11 of the DTR) was 94 percent (i.e., 16 of 17 predictions). The only polygon erroneously predicted to not be likely impaired was NA22, which had a SS-MEQ of only 0.35. As stated in Section 32.5.2 of the DTR, however, there is substantial evidence of non-COC related impairment from physical disturbance in that polygon. The ability of the threshold SS-MEQ of 0.9 to accurately predict likely impairment (referred to as likely efficiency in Table A32-11 of the DTR) was only 38 percent (i.e., 5 of 13 predictions). That is, the SS-MEQ threshold of 0.9 predicted impairment at a substantial number of locations without impairment, as well as stations with impairment. These results indicate that there is a very high degree of confidence that polygons with SS-MEQ values less than 0.9 are not likely to be impaired. Therefore, the decision to include all polygons with SS-MEQ less than 0.9 in the remedial footprint is environmentally protective. In contrast, there is much less confidence that polygons with SS-MEQ values greater than 0.9 are likely to be impaired. Therefore, the conservative decision to include all polygons with SS-MEQ values greater than 0.9 in the remedial footprint is also environmentally protective, because over half of those polygons may not be impaired. Contrary to the SDC and EHC (2011) assertion, the information presented above indicates that the threshold SS-MEQ of 0.9 is an environmentally protective predictor of both the presence and absence of impairment at the Shipyard Site.

BAE Systems stated that MacDonald's assertion that the SS-MEQ does not provide an effects-based tool for predicting adverse effects on benthic macroinvertebrate communities is incorrect, as the SS-MEQ was specifically developed to be a site-specific effects-based assessment tool. As described in Section 32.5.2 of the DTR, the SS-MEQ was developed using the median sediment concentrations of the primary COCs at Stations NA19, NA22, SW04, SW13, SW22, and SW23. Inspection of Table 18-1 of the DTR shows that this set of stations included all six of the likely impaired stations found at the Site. Therefore, calculation of the median COC concentrations from the six likely impaired stations at the Site was directly analogous to the manner in which Long et al. (1995) developed the ERM values. In addition, the predictive reliability of the SSMEQ was evaluated, and the threshold value of 0.9 was selected, using the site-specific effects determinations for the 30 Triad stations, as well as the 5 supplemental Triad stations sampled at the Site. MacDonald's assertion that the SS-MEQ is not effects-based is, therefore, invalid.

Regarding the assertion that 60% LAET threshold is too high, BAE Systems commented that the apparent basis for this assertion is the evaluation conducted by MacDonald (2011), in which

he showed that the 60% LAET values were greater than the ERM values of Long et al. (1995). That comparison is flawed, however, because the LAET values were derived as site-specific values that reflect the mixtures of chemicals at the Shipyard Site, in addition to other important factors such as the site-specific bioavailability and bioaccessibility of those chemicals. By contrast, the ERM values were derived from sediment chemistry and toxicity data collected throughout the U.S., without any consideration of bioavailability or bioaccessibility. They are therefore only suitable as initial screening values for a site, rather than values that can reliably predict the presence or absence of sediment toxicity on a site-specific basis. In fact, Long et al. (1995) recognized the limited usefulness of the ERM values when they concluded that the values “should be used as informal screening tools in environmental assessments,” and “they are not intended to preclude the use of toxicity tests or other measures of biological effects.” Because the ERM values are generic screening values that do not consider bioavailability, it is not surprising that the 60% LAET values are greater than the ERM values, as the former values reflect the site-specific conditions that occur at the Shipyard Site. Therefore, SDC and EHC’s assertion has no bearing on the usefulness of the site-specific 60% LAETs for identifying stations that are likely impaired at the site.

ID 77

Coastkeeper's and EHC's final assertion is that the DTR failed to explicitly consider the potential effects exposure to contaminated sediments would have on fish with small home ranges. This failure is problematic because fish with small home ranges are known to utilize benthic habitats at the Site and the concentrations of PCBs in sediments are sufficient to adversely affect the reproduction of fish at various locations. See MacDonald 2011 at 15.

ID 408

In rebuttal, the NASSCO cited the Declaration of the Port District's expert witness, Dr. Michael Johns as follows: "In my opinion, the process used by the Water Board to identify areas requiring remedial actions (e.g., use of polygons to define the remedial footprint) was appropriate. In using the polygons, the Water Board recognized that species such as fish and spiny lobster are mobile and that exposure to Site contaminants can occur site-wide rather than only at a single location. In developing the proposed remedial footprint, the Water Board correctly addressed impairment to more sedentary species, such as the organisms that form the benthic community. The factors used by the Water Board to select “worst first” polygons are consistent with my findings."

ID 334

NASSCO also agreed with BAE Systems' comment on this topic and incorporated it into NASSCO's comments.

ID 174, 430

BAE Systems commented that a fundamental flaw in the fish analyses conducted by MacDonald (2009) was the assumption that gobies represent an appropriate indicator species for evaluating risks to benthic fish at the Site. As discussed above, gobies were not found at the Site after an extensive sampling effort conducted as part of the 2001/2002 sampling events. Therefore, the use of gobies as an appropriate indicator species for the site by MacDonald was inappropriate. Also discussed above was the fact that MacDonald provided no documentation that gobies occur at the



Site, and that he admitted that he had not reviewed Exponent (2003) in sufficient detail to know the results of the fish survey conducted at the Site.

Further, BAE Systems commented that Coastkeepers' and EHC's fourth assertion is inaccurate. The species selected for detailed evaluation at the Shipyard Site was the spotted sand bass (*Paralabrax maculatofasciatus*) because, as stated in Exponent (2003), this species preys primarily on benthic macroinvertebrates, exhibits limited spatial movements, and is abundant in numerous kinds of habitats within San Diego Bay, including the Shipyard Site, as documented during the fish sampling effort prior to the 2001/2001 sampling events. These characteristics of the spotted sand bass make it an appropriate species for assessing contaminant exposure at the Shipyard Site. This determination is reinforced by the results of tissue chemistry analyses. Spotted sand bass were collected at four locations, inside and outside the leaseholds of both shipyards, and the results showed that chemical concentrations in fish tissue from inside the leaseholds were greater than concentrations in fish collected immediately outside the leaseholds (Exponent 2003). The data therefore clearly indicate that spotted sand bass are sensitive to spatial differences in sediment chemistry concentrations at the Shipyard Site. Although gobies were identified as a possible alternative species for use at the Shipyard Site, they were not found at the site during an extensive sampling effort prior to the 2001/2002 sampling event. As stated on Page 2-7 of the Exponent (2003) report, "attempts were also made to collect gobies, without success at either site." Representatives from the California Department of Fish and Game observed the fish collection effort and agreed that gobies were absent or rare at the Shipyard Site.

Further, Coastkeeper's and EHC's concerns are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on the results of extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). MacDonald (2009) conducted a hypothetical risk analysis based on gobies, which were not found at the Shipyard Site during the extensive fish collection efforts that were conducted prior to the 2001/2002 sampling events at the site (Exponent 2003). That analysis was flawed for numerous reasons, however, and has no relevance for determining which polygons warrant inclusion in the remedial footprint. Some of the major methodological flaws in the hypothetical analysis conducted by MacDonald (2009) are as follows:

- Indicators Species: As discussed above, the selection of gobies as the indicator species was inappropriate because they are not found at the Shipyard Site.
- Toxicity Reference Value (TRV): MacDonald (2009) used a study by Orn et al. (1998) to develop the TRV for PCBs in fish. However, that study was based on zebrafish (*Danio rerio*) which, as a tropical freshwater species, are not found in San Diego Bay, and thus has questionable relevance to the marine fish species that reside in the Bay.
- Toxicity Endpoint: MacDonald (2009) selected reproduction as the endpoint for developing the TRV for PCBs, and developed the TRV based on ovary weight and the gonad somatic index (GSI). However, he ignored the fact that other reproductive endpoints (i.e., percentage of spawning females, mean number of eggs per female, and median hatching time), as well as early mortality showed no significant reductions in response to exposure to PCBs.
- Biota Sediment Accumulation Factor (BSAF): MacDonald (2009) used a BSAF determined for spotted sand bass in an unpublished memo by Zeeman (2004).

- Lipid Content: MacDonald (2009) assumed the lipid content of the gobies was 4 percent, based on the naked goby (*Gobiosoma bosc*) and presented in an unpublished presentation by Lederhouse et al. (2007).
- Moisture Content: MacDonald (2009) assumed a whole-body moisture content of 80 percent for fish to convert the wet weight PCB concentrations presented in Orn et al. (1998) to dry weight.

In summary, MacDonald (2009) conducted a hypothetical analysis that predicted PCB concentrations in gobies, a species that does not occur at the Shipyard Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, an unpublished lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above items has uncertainties attached to it, which MacDonald (2009) did not attempt to quantify or even acknowledge. Given each of the uncertainties in MacDonald's hypothetical analysis, as well as the cumulative nature of them all, it is clear that the results of the hypothetical analysis conducted by MacDonald (2009) cannot be used to assess risk to fish at the Shipyard Site in a meaningful manner. In addition, such a hypothetical analysis is irrelevant because the extensive amount of site-specific information on the barred sand bass showed that risks to fish were not an issue at the Shipyard Site under baseline conditions.

ID 176

BAE Systems also provided the following comment on the MacDonald (2011) conclusion that SWACs do not provide a basis for accurately assessing the impacts on benthic invertebrates or benthic fish. According to BAE Systems, the DTR used SWACs to evaluate risks to fish and wildlife that may utilize the Shipyards Site. MacDonald's conclusion is invalid because SWACs are commonly used to evaluate risks to benthic fish at contaminated sediment sites, as they were at the Site. Contrary to MacDonald's assertion, other tools were used to evaluate risks to benthic invertebrates at the Site, including evaluations of sediment chemistry, sediment toxicity, in situ benthic macroinvertebrate communities, measures of chemical bioavailability, contaminant breakdown products in fish bile, and fish histopathology.

ID 330, 329

In rebuttal to Coastkeeper's and EHC's general assertion that the remedial footprint should be expanded, NASSCO commented that Site conditions are generally favorable, and any active remediation will result in only minimal benefits. Second, under Resolution No. 92-49, the Regional Board is required to consider economic feasibility in setting alternative cleanup levels; an expanded footprint would not be consistent with the requirements of Resolution No. 92-49 given the fact that only minimal benefits, if any, would be achieved, at substantial cost to the parties named to the TCAO. Third, for the reasons discussed above, these comments are without scientific merit, and do not support an expanded footprint.

Size of the remedial footprint is irrelevant to the assessment of beneficial uses or remediation to mitigate beneficial use impairment. Attachment A, Exponent Critique, at 8. The only relevant consideration is whether residual sediment chemicals are protective of beneficial uses, as determined by exposure assessment on an appropriate spatial scale. *Id.* At many sites, remedial goals can be achieved through the selective removal of hot spot contamination. Further, there is

ample evidence set forth in NASSCO's Initial Comments demonstrating that the cleanup is excessively conservative, and that site conditions do not warrant any remediation beyond monitored natural attenuation, which is already occurring.

### **Response 33.1**

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#### **The Number of Samples is Sufficient**

The rebuttal comments of BAE Systems and NASSCO addressing the number of sampling stations and their distribution for the Shipyard Sediment Site investigation are correct. The number of sampling stations and their distribution throughout the Shipyard Sediment Site were selected to have greater density in areas near the sources and discharge points (i.e. near shore) and less density farther from sources and discharge points (i.e. farther from shore). (See SAR 065405, SAR065413, SAR065659, SAR094672, SAR 066102, SAR095254, SAR095502, and SAR095511.) The station distribution scheme was consistent with the manner in which most schemes are designed at contaminated sediment sites. Furthermore, the sampling design is consistent with the MacDonald 2011 report which calls for a higher sampling density near sources to account for spatial variability. Sampling results confirmed the assumptions used in the design.

The San Diego Water Board conducted a stakeholder process during the sediment quality investigation as described in DTR Section 13.3. As explained in the DTR, "[a]t meetings and workshops, experts, and interested parties representing the shipyards and a diverse group of stakeholders had the opportunity to provide critical input and share knowledge on various aspects of the Shipyard Sediment Site investigation, including review of the work plan." ( See for example SAR097527 and SAR095345) There were no State Water Board state-wide guidelines for conducting sediment quality assessments or criteria for numbers of sampling sites; accordingly the San Diego Water Board developed its own guidelines and sampling requirements in consultation with SCCWRP. (SAR 065405 and SAR065413). The San Diego Water Board considered lessons learned from previous sediment sampling designs, and the input from stakeholders in making its final decision on the number of sampling sites. Ultimately, the sampling design came down to best professional judgement and the sediment quality investigation results proved adequate to characterize the distribution of contaminants at the site for the purpose of issuing the TCAO. A detailed discussion summarizing the San Diego Water Board's supporting rationale for the sampling design was provided to EHC and Coastkeeper following the Board's August 3, 2001 workshop and follow-up October 21, 2001 meeting (see SAR095502 and SAR095511).

#### **Polygon Ranking Considers Adverse Effects on Health and Environment**

The polygon ranking score for building the remedial footprint relied solely on chemistry data as pointed out in Coastkeeper's and EHC's comment. For that reason, the post-remedial SWACs were evaluated using a risk assessment approach to ensure they are reasonably protection of human health and aquatic dependent wildlife. (See DTR Section 32.3 and 32.4). The risk assessments included evaluations of primary and secondary COC risk drivers identified in the baseline Tier II risk assessments (See DTR Sections 24 and 28). DTR Section 32.3 inadvertently omitted information on the wildlife risk assessment for zinc in Tables 32-7 and 32-8. The DTR has been revised to include this information. Benthic community protection was ensured by

evaluating the remedial footprint and residual sediment chemistry by the methods described in DTR Section 32.5.

Regarding the Port District's expert's declaration, the Cleanup Team agrees that the portion of Polygon 29 not in the remedial footprint warrants further action. The Cleanup Team recommends that the San Diego Water Board issue a Cleanup and Abatement Order or Investigative Order to responsible parties to conduct a full sediment quality investigation to determine the extent of sediment contamination in the SW29 area and the area north of the Shipyard Sediment Site, and to determine if sediment quality meets the sediment quality objectives in the Bays and Estuaries Plan, and/or water quality objectives in the Basin Plan.

The Cleanup Team accepts NASSCO's explanation of the technical infeasibility of dredging polygon NA23.

### **Remedial Footprint Does Not Arbitrarily Exclude 15 Polygons**

Polygon NA09 was added to the remedial footprint as a replacement for polygon NA07 which was determined to be technically infeasible to dredge. Two of the NASSCO leasehold polygons with higher ranking scores (NA23 and NA27) were excluded because they were also judged to be technically infeasible to dredge. The other polygons with higher ranking scores also had "unlikely" impacted triad results in either the DTR WOE approach or the Bays and Estuaries Plan MLOE approach (NA01, NA16, NA03, and NA04). Polygon NA09's triad result was "possibly" impacted under both the DTR WOE approach and the Bays and Estuaries Plan MLOE approach. Additionally, polygon NA09 has high COC concentrations at depth that aren't reflected in the surface sediment chemistry upon which the ranking score is based. The estimated dredge depth to reach background concentrations for this polygon is 9 feet, the deepest of all the polygons in the footprint by 2 feet. Polygon NA09 also had the 10th highest mercury concentration of the 65 polygons (See DTR Table 33-4). So although this polygon's overall ranking score is lower than 12 other polygons feasible to dredge but excluded from the footprint, cleaning up this polygon is expected to remove a relatively high mass of contaminants from the environment.

The comments pointed out an error in Table 33-6. The Table will be revised to delete the bullet point ""All COCs below 60% LAET values" for Polygon NA07. This revision will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

### **Non-Triad Approach Thresholds Are Appropriate**

The rebuttal comments of BAE Systems and NASSCO are generally correct. The SS-MEQ was developed (See DTR Section 35.5.2) using site-specific data to be an environmentally protective site-specific predictor of both non-likely and likely benthic impairment at the Shipyard Sediment Site non-triad stations. (Non-Triad stations refers to the 36 of the 66 Site sampling stations where toxicity and benthic community data was not collected.) By contrast, SQGQ1 values for a sediment are based on sediment quality guidelines (SQGs) that do not explicitly consider the site-specific bioavailability, toxicity, and benthic community conditions at the Shipyard Sediment Site. The SQGQ1 value for a sediment is estimated by dividing concentrations of cadmium, copper, lead, silver, zinc, total chlordane, dieldrin, total polycyclic aromatic hydrocarbons (PAHs; normalized by sediment organic carbon content), and total PCBs (sum of

18 congeners) in sediment by each chemical's empirical SQG (SAR280606). The SQGs used in the SQGQ1 approach are referred to as "empirical" SQGs because they are derived from large sets of sediment chemistry and toxicity data collected at sites throughout the United States, without any consideration of Shipyard Sediment Site specific conditions. The SQGQ1 is an appropriate tool to use as one of three metrics to evaluate the sediment chemistry leg in the DTR WOE approach for determining whether marine sediment contaminant concentrations at the Shipyard Sediment Site warrant further assessment or were at a level that requires no further evaluation. By contrast, the SS-MEQ threshold is solidly based on both chemical and biological triad data collected at the site and is a more appropriate tool than the SQGQ1 as a reliable site specific predictor to assess both non-likely and likely benthic impairment at the Shipyard Sediment Site non-triad stations.

Like the SQGQ1, the SS-MEQ metric accounts for the potential biological effects of sediment chemical mixtures. The SS-MEQ metric was derived from sediment chemistry data from 6 "likely impaired" triad stations. The SS-MEQ was then successfully tested at 5 additional triad stations where the SS-MEQ accurately predicted that none of the stations were likely impacted. The SS-MEQ threshold was conservatively optimized at 0.9 to minimize false negatives (ie, predicting that a station is not likely impaired when triad data indicate it is likely impaired). The optimization data showing how and why 0.9 was chosen as the optimal threshold are contained in the Appendix to Section 32.

Coastkeeper asserts that the site specific 60% LAET threshold for classifying sediment stations as likely impacted is too high. Nonetheless, the combined SS-MEQ and 60% LAET thresholds accurately predicted the WOE outcomes at the 5 additional triad stations sampled and tested in 2009. As BAE Systems pointed out, the 60% LAET values are specific to the Shipyards Sediment Site and reflect chemical mixtures, bioavailability, and bioaccessibility factors based on site specific data.

MacDonald (2011) commented that none of the 5 stations tested had sediment chemistry that exceeded the 60% LAET threshold, so the predictability of the threshold was not adequately tested. The stations chosen for testing the non-triad approach were the 5 non-triad stations with the highest sediment chemistry. Although the sediment chemistry at these stations was well below the 60% LAET thresholds, none of the untested non-triad stations exhibited higher sediment chemistry levels. Thus, for this purpose, the 60% LAET threshold is accurately predictive.

MacDonald (2011) also criticized the testing of the non-triad approach because only 5 stations were used. Although more data is always desirable, triad samples are expensive to collect and analyze. The DTR non-triad approach using the site specific 0.9 SS-MEQ and 60%LAET thresholds accurately predicted the triad outcome of the 5 stations and additional testing was unwarranted. The data presented in Table 32-21 of the DTR show that a threshold value of 0.9 has an overall reliability of 70 percent. The reliability was erroneously stated in the text as 73 percent in DTR Section 32.5.2 as pointed out in McDonalds comments. The DTR will be revised to correct this error. This revision will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings. The Cleanup Team concurs with BAE System's comment that the reduction in reliability of 3 percent to correct the text error is not statistically

meaningful nor does the reduction diminish the SS-MEQ as a reliable basis for identifying polygons that are “likely” impacted.

Furthermore, the 5 station test is adequate because the SS-MEQ was conservatively optimized to minimize false positives, the site specific LAET values were conservatively lowered to 60% of the calculated LAET, and the remaining non-triad stations to be evaluated with the approach had relatively low sediment chemistry compared to the other stations in the Shipyard Sediment site.

### **The DTR Did Not Fail to Consider Effects on Fish with Small Home Ranges**

Coastkeeper's comment on the potential effects on fish with small home ranges was also used to criticize the exclusion of certain polygons from the remedial footprint. The response to this comment can be found in Response 33.2 below.

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## **RESPONSE 33.2**

### **DTR Section: 33**

**Comments Submitted By:** NASSCO, BAE Systems, City of San Diego, Coastkeeper and EHC  
**Comment IDs:** 78, 79, 80, 90, 111, 139, 167, 171, 172, 184, 185, 186, 188, 189, 250, 287, 335, 336, 337, 365, 368, 371, 433, 436

### **Comment**

Coastkeeper and EHC commented that the law requires every cleanup to result in the "best water quality reasonable." See Resolution No. 92-49. The following aspects of the proposed cleanup prevent it from achieving the "best water quality reasonable." The Proposed Remedial Footprint indicating "polygons targeted for remediation" is too small to ensure that present and anticipated beneficial uses of San Diego Bay are protected. See Order at 38, Attachment 2. The Proposed Remedial Footprint excludes eight polygons that, under the DTRs own methodology, should have been included. They commented that Polygons NA22, NA01, NA04, NA07, NA16, SW06, SW18, and SW29 should be added to the final remedial footprint. They cited the expert report of McDonald as evidence supporting the inclusion of these polygons in the footprint as discussed below.

### **POLYGON NA22**

#### **ID 79**

Coastkeeper and the EHC commented that the DTR acknowledges that polygon NA22 is "Likely" impaired and should be remediated because Contaminants of Concerns in sediments are likely adversely affecting benthic invertebrates within this polygon. However, NA22, and portions of polygons NA 20 and 21, have improperly been excluded from the Proposed Remedial Footprint, principally because these polygons or portions of polygons are in the vicinity of a Total Maximum Daily Load being prepared for the Mouth of Chollas, Switzer, Paleta Creeks ("Creek Mouth TMDL"). Further, by excluding NA22 from the Post Remedial Monitoring program, the Order and DTR try to pretend that NA22 is not part of the Shipyard Sediment Site. By failing to include NA22 in the Post Remedial Monitoring, the Order and DTR underestimate the site-wide average pollutant levels in an attempt to mask the true consequences of refusing to remediate a portion of the Site that poses unacceptable risk to beneficial uses.

ID 90

Further, The DTR incorrectly claims that the Proposed Remedial Footprint "captures 100 percent of triad 'Likely'... impacted stations." This claim is incorrect because the Proposed Remedial Footprint excludes NA22, which the DTR analysis determined was "likely impacted."

The DTR repeatedly refers to "65" polygons, even though there are a total of 66 polygons in the Shipyard Sediment Site. The economic feasibility documentation in Appendix 31, Table A31-2 and the spreadsheet "2010-07-27 Economic feasibility 07-27-IO.ng.xls" (SAR384569) reveal that all 66 polygons were ranked in the economic feasibility analysis. Similarly, Appendix 32, Tables A32-1 and A32-3 and supporting data and calculations in "01-Final pre-remedial SWAC 8-17-10.XLS" (SAR384570) and "02-Final post-remedial SWAC\_1.xls" (SAR384571) show all 66 polygons were included in calculating the pre-remedial SWACs and post-remedial SWACs. The DTR cannot pretend that NA22 no longer exists or is no longer part of the Shipyard Sediment Site just because the Cleanup Team chose not to include it in the Proposed Remedial Footprint in the hope that someday another process might address contamination in that polygon.

ID 365

In rebuttal, NASSCO stated that the San Diego Water Board made a rational decision to address NA22 as part of the TMDL process, so that additional information concerning the cause of impairment at NA22 could be gathered. This decision was explained thoroughly in the DTR, which clearly states that NA22 "is not considered part of the Shipyard Sediment Site for purposes of the CAO." DTR, at 18-2, 18-11, 18-16, 18-19, 18-23, 18-24, 32-32, § 33.1.1. The decision to exclude NA22 is well within the Regional Board's discretion, and does not render untrue the statement that the proposed remedial footprint "captures 100 percent of Triad "Likely" . . . impacted stations" since for purposes of the TCAO, NA22 was expressly not included in the definition of the Site.

ID 368

NASSCO also commented that station NA22 was specifically excluded from consideration for cleanup because it is being addressed as part of the Mouth of Chollas Creek TMDL determination, currently being undertaken by the Regional Board. Thus the total number of stations was reduced from 66 to 65 for purposes of determining the need for remediation.

ID 167, 433

BAE Systems commented that, as stated in Section 33 of the TCAO, "portions of polygons NA20, NA21, and NA22 as shown in Attachment 2 were omitted from this analysis because it falls within an area that is being evaluated as part of the TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas Creek TMDL and is not considered part of the Shipyard Sediment Site for purposes of the CAO." The decision to remove these polygons from the Site was therefore an administrative one, rather than a technical one, and therefore does not require technical justification as MacDonald implies. In addition, because MacDonald is not participating in the design of the TMDL process for these polygons he has no direct knowledge of what the process will include. Therefore, MacDonald's assertion regarding the manner in which NA22 will be addressed is unsupported.

ID 79

Coastkeeper and the EHC commented that the Creek Mouth TMDL will not address the existing contamination in polygon NA22. Quoting case law, Coastkeeper stated that TMDLs function primarily as planning devices and are not self-executing. TMDLs are primarily informational tools that allow the states to proceed from the identification of waters requiring additional planning to the required plans. A TMDL does not, by itself, prohibit any conduct or require any actions. A TMDL merely "forms the basis for further administrative actions that may require or prohibit conduct with respect to particularized pollutant discharges and waterbodies. A TMDL itself does not reduce pollution. TMDLs inform the design and implementation of pollution control measures.

The TMDL process cannot provide a vehicle for remediating contaminated sediment within the NA22 polygon. A new and separate remediation process—another Cleanup and Abatement Order—would need to be initiated after completion of the Creek Mouth TMDL to address existing contaminated sediment in NA22, if it is not remediated under the current Order. When asked in depositions, no Cleanup Team member could point to a TMDL that had been implemented through dredging. This means that removing NA22 from the Proposed Remedial Footprint virtually guarantees that it will never be dredged—even though the DTR agrees that it is "Likely" impaired. Furthermore, TMDLs are given a long time period—typically twenty years—before they need to be implemented. Adding this delay together with the time it would take to develop another cleanup and abatement order to address NA22 means that any possible cleanup of NA22 would not be for decades down the road. It is a waste of time and resources to put off remediating NA22 when a framework for its remediation has already been established in this process.

ID 287

In Rebuttal, the City of San Diego commented that polygon NA22 is located next to the piers where full thrust engine testing takes place, resulting in significant physical disturbance to the underlying sediments. Additionally, tugboat movements throughout the day and night most days of the year and large ship movements to and from piers in the Mouth of Chollas Creek further disturb sediments. Navy collected bathymetry data shows sediment elevation contours in this area suggesting of significant "blow-out" of sediments, likely from propeller activity during engine testing. The physical disturbance may be the most significant factor affecting the benthic community. In fact, levels of chemicals of concern throughout the shipyard sediment site do not correlate with observed benthic community effects. However, at the only locations where significant physical disturbances take place routinely, benthic community effects are observed.

The City of San Diego further commented that the upper and lower Newport Bay organochlorine compound TMDL includes stipulations in its implementation plan for dredging of sediments in addition to special studies, natural attenuation, and discharge controls. The dischargers, among numerous other requirements, are to submit a report that "Evaluate[s] feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay." See Santa Ana Regional Water Quality Control Board Resolution No. R8-2007-0024 (City Ex. 4). It is not unheard of to use a TMDL to compel a discharger to remediate contaminated sediments. It is the expectation of the City that the Regional Board will use the



Chollas Mouth TMDL to compel dischargers to take necessary actions to mitigate the impairment and another cleanup and abatement order will not be necessary.

ID 336

In rebuttal, NASSCO commented that although the triad weight-of-the-evidence analysis categorized NA22 as “Likely” impaired, this designation was based upon “Moderate” chemistry, toxicity, and benthic community results for each of the three legs of the triad. DTR, at 33-4 (citing Table 18-1). However, NA22 is an area where propeller testing occurs routinely, suggesting that the observed benthic condition may be the result of physical impacts, rather than site contaminants. DTR, at 33-4. Additional sampling in connection with the TMDL proceeding may clarify the cause of the potential impairment, and permit the Regional Board to make a more fully informed decision concerning what, if any, remediation is required. Because there is expected to be substantially more data available to evaluate the cause of observed impacts to NA22 following the completion of the TMDL proceedings than is presently available, the Regional Board’s decision to exclude NA22 from the current cleanup is reasonable.

ID 185

BAE Systems made the following comment on the conclusion in MacDonald 2011 that the “TMDL process will not provide a vehicle for remediating contaminated sediment.” BAE Systems stated that MacDonald's conclusion is invalid. The decision to remove these polygons from the Site was an administrative decision, rather than a technical decision, and therefore does not require technical justification as MacDonald implies. In addition, because MacDonald is not participating in the design of the TMDL process for these polygons he has no direct knowledge of what the process will include. Therefore, MacDonald’s assertion that the manner in which these polygons will be addressed is both invalid and unformed.

### **POLYGONS NA01, NA04, NA07, NA16, SW06, SW18, AND SW29**

ID 80

Coastkeeper and EHC commented that sediment quality in these polygons pose unacceptable risks to fish and the benthic community. The DTR arbitrarily excluded at least a dozen polygons from the Proposed Remedial Footprint without explanation. See MacDonald 2011 at 14-15. An independent evaluation of the available data and information by sediment remediation expert Donald MacDonald indicates that seven of these excluded polygons pose risks to organisms utilizing habitats within the study area. (MacDonald 2009). MacDonald (2011; p. 39, Table 5) presents the results of an evaluation for seven polygons that should be added to the Remedial Footprint to address inconsistencies in the procedures applied in the DTR and the risks posed to fish and benthic organisms.

ID 436 and 184

In rebuttal, BAE Systems commented that with respect to fish, the concerns are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on the results of extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). As discussed previously, MacDonald (2009) conducted a hypothetical risk analysis based on gobies, which was flawed for numerous reasons and therefore has no bearing on determining which polygons warrant inclusion

in the remedial footprint at the Shipyard Site. Briefly, MacDonald (2009) conducted a hypothetical analysis that predicted PCB concentrations in gobies, a species that does not occur at the Shipyard Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, an unpublished lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above items has uncertainties attached to it, which MacDonald (2009) did not attempt to quantify or even acknowledge. Given each of the uncertainties in MacDonald's hypothetical analysis, as well as the cumulative nature of them all, it is clear that the results of the hypothetical analysis conducted by MacDonald (2009) cannot be used to assess risk to fish at the Shipyard Site in a meaningful manner. In addition, such a hypothetical analysis is irrelevant because the extensive amount of site-specific information on the barred sand bass showed that risks to fish were not an issue at the Shipyard Site under baseline conditions.

BAE Systems commented that these polygons were appropriately excluded from the proposed remedial footprint. BAE Systems claims that, contrary to the assertion by MacDonald, the remedial footprint identified in the TCAO does meet the requirements of cleanup according to the methods described in the DTR. Therefore, there is no technical justification for expanding the footprint to include additional polygons.

ID 172, 186

In rebuttal to MacDonald's conclusions that in order to be scientifically valid, the DTR's conclusions of technical infeasibility must be supported by detailed engineering studies, BAE Systems made the following comment. MacDonald's assertion regarding the determinations of technical infeasibility are invalid, because those determinations were made by a group comprised of multiple parties with a range of backgrounds and expertise, including resource agencies and shipyard operations personnel. In addition, there is no formal requirement that engineering studies be conducted to make a determination of technical infeasibility. In addition, none of the affected polygons warranted inclusion in the remedial footprint, regardless of concerns related to technical feasibility. MacDonald's statement regarding technical infeasibility is therefore invalid, and ultimately irrelevant based on the chemical and biological indicators measured in the affected polygons.

ID 172

In addition, NA07 and NA23 were found not to be likely impaired based on the original or supplemental Triad analyses (see Tables 18-1 and 32-22 of the DTR, respectively). In addition, all primary COCs were below their 60% LAET values and SS-MEQs were less than the threshold value of 0.9 at NA08 and NA27. Therefore none of these four polygons warrant inclusion in the remedial footprint, regardless of concerns related to technical feasibility. MacDonald's statement regarding technical infeasibility is therefore inappropriate, and ultimately irrelevant based on the chemical and biological indicators measured in the four polygons.

ID 171

Regarding technical infeasibility, NASSCO provided the following rebuttal comment. Contrary to the March MacDonald Report's assertion, the DTR does provide information about the technical infeasibility posed by dredging in Stations NA07, NA08, NA23, and NA27 (see DTR,

Section 33.1.4). Furthermore, as discussed in the memorandum from Anchor QEA, no engineering studies are necessary to conclude that dredging in these stations is technologically infeasible. In fact, it is possible to determine that dredging is technically infeasible due to site characteristics alone. Attachment D, Memorandum by Michael Whelan, Anchor QEA (May 25, 2011) (Anchor QEA Memo), at 2-4.

ID 188

BAE Systems also commented that the DTR provides detailed justification as to why each polygon at the Site was or was not included in the remedial footprint. General Conclusion #1 of MacDonald 3/11/11 Expert Report states that "The results of an independent evaluation of the available data and information that I performed in 2009 indicate that additional polygons should be included in the sediment remedial footprint for the Shipyard Sediment Site (MacDonald 2009). This conclusion is invalid, because the methods, results, and conclusions of MacDonald (2009) have come under severe technical criticism both at his October 2010 deposition, and in follow-up expert reports. The use of that report to justify that additional polygons should be included in the remedial footprint is therefore inappropriate from a technical standpoint.

ID 172

BAE Systems provided rebuttal to MacDonald's statement that "no rationale was provided for excluding NA01, NA04, NA06, NA16, NA16 [sic], NA21, SW25, or SW29 from the Remedial Footprint." According to BAE Systems, this statement was apparently derived largely from MacDonald's erroneous assumption that polygons should be included in the remedial footprint based solely on Composite SWAC Ranking Values higher than 5.5. As discussed in the response to Comment C.2.3 above, the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. In addition, the SWAC Value of 5.5 was not intended to be a threshold value. MacDonald's assertion is therefore an artifact of his misunderstanding of how the Composite SWAC Ranking Values were used along with other lines of evidence, and is therefore invalid. BAE Systems also pointed out that there are two discrepancies in MacDonald's list. He erroneously identified Polygon NA06 as being excluded from the remedial footprint when, in fact, it is included in the footprint (see Attachment 4 of the TCAO). In addition, MacDonald erroneously listed Polygon NA16 twice.

ID 171, 189, 250

General Conclusion #2 of MacDonald 3/11/11 Expert Report states that "The following polygons pose unacceptable risks to fish and would likely or possibly adversely affect the benthic community: NA01, NA04, NA07, NA16, SW06, SW18, and SW29." "In addition, polygon NA22 should be included in the Remedial Footprint because it...is not valid to exclude it based on its consideration in the TMDL process for the Mouth of Chollas Creek." This conclusion is invalid with respect to fish, as described in detail in the response to Comment C.2.9, and also in abbreviated form in the response to Conclusion C.3.9. With respect to benthic macroinvertebrate communities, the comment is invalid because multiple site-specific indicators of sediment quality showed that the polygons do not pose risks to benthic macroinvertebrate communities, as follows:

- NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.
- NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ values (0.69) was less than the threshold value of 0.9.
- NA07: Not likely impaired based on Triad analysis.
- SW06: Not likely impaired based on the supplemental Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ values (0.63) was less than the threshold value of 0.9.
- SW18: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.62) was less than the threshold value of 0.9.
- SW29: No primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.71) was less than the threshold value of 0.9

Based on the information presented above, MacDonald's assertions that the six polygons pose risks to fish, and potentially risks to benthic macroinvertebrate communities, are both invalid.

#### ID 172

BAE Systems provided rebuttal as follows to Coastkeeper's Expert Report statement that the rationale provided in Table 33-6 of the DTR for excluding certain polygons from the Remedial Footprint is not sufficient. MacDonald states that "the polygon SW03 was excluded from the Proposed Remedial Footprint, even though sediments within this polygon had elevated levels of cadmium." This statement is misleading because it implies that decisions about whether a polygon should be included in the remedial footprint are based solely on a single line of evidence. However, in considering the multiple lines of evidence collected at SW03, including direct measures of biological effects, this polygon was found to have a low potential for both sediment toxicity and benthic community effects and was therefore determined not to be likely impaired (see Table 18-1 of the DTR). Therefore, although cadmium concentrations may have been elevated in Polygon SW03, they did not result in moderate or high levels of biological effects, potentially due to reduced bioavailability. Because the weight-of-evidence scheme used at the Site identified SW03 as not likely impaired, that polygon was appropriately excluded from the remedial footprint. MacDonald's assertion is therefore invalid.

#### ID 111

Coastkeeper and the EHC commented that adding NA22, NA01, NA04, NA07, NA16, SW06, SW18 and SW29 would ensure that the alternative cleanup levels are met even if the 120% background trigger level for a second dredging pass is retained.

#### ID 111

Coastkeeper and the EHC commented that remediating eight additional polygons is economically feasible. To remediate the additional eight polygons would require dredging an additional 120,000 cubic yards of sediment—30,550 cubic yards from NA22 and the remaining

89,400 cubic yards from the other 7 polygons. See "2010-07-27 Economic feasibility 07-27-10^g.-xls" (SAR384569). At an estimated cost of \$7 per cubic yard outside the leasehold and \$13 per cubic yard inside the leasehold, [Footnote 10 - These numbers represent the "Probable Likely Unit Cost" as represented in "Economic Feasibility Source Data," provided to counsel for San Diego Coastkeeper and Environmental Health Coalition at the deposition of David Barker on March 3, 2011. It is unclear whether these numbers are a fair representation of actual dredging costs because the source of this cost assumption was not provided.] the total additional dredging cost would be approximately \$1.5 million, [Footnote 11 - This number includes only the cost to dredge the additional eight polygons and does not add in additional costs that may be associated with dredging, such as sediment disposal or mitigation costs.] or only 2% of the current estimated cleanup cost. [Footnote 12 - According to DTR § 32.7.1 at 32-40, the estimated cleanup cost is \$58 million.]

ID 436

In rebuttal, BAE Systems commented Coastkeeper and EHC's estimate included only the cost for the dredge to remove the sediment from the bay bottom. It is unclear what SDC and EHC intended regarding all of the other costs associated with the remedial action, but there are additional substantial costs associated with any dredging, especially in a remedial action.

The June 22, 2011 declaration of Shaun Halvax, attaching a spreadsheet of cost assumptions, estimates that the cost for remediating the additional polygons is many times SDC and EHC's estimate. Mr. Halvax's declaration states he is in charge of BAE Systems' dredge activities in San Diego and other west coast locations and just completed dredging in BAE Systems' shipyard in January 2011. Mr. Halvax states that total dredging, disposal, and underpier remediation (inclusive of environmental protection measures and monitoring) will cost an estimated \$23,900,000. Costs associated with remedial dredging not considered by SDC and EHC include debris management, additional dredging/cleanup pass, protection of structures, return water management, disposal, clean sand cover, and sediment sampling/water quality monitoring. Details of these additional, but necessary, costs, including unit costs and assumptions may be found in the Halvax spreadsheet.

Instead of an incremental cost of approximately \$1,500,000, the more accurate cost associated with the additional 120,000 cubic yards of sediment is \$23,900,000. Even then, this estimate does not include any provision for uncertainty, permitting, long-term monitoring, design, construction management, and other potential costs that may incrementally increase the total cost of the remedial effort. Rather than an incremental increase of 2.58% to the cost of the proposed remedial action, the addition of SDC and EHC's suggested polygons will increase the estimated cost by 41% over the current estimate of \$58,100,000. (DTR § 32.1.1 at 32-40.) If additional polygons are dredged, as SDC and EHC urge, the likely cost of remediating the site will increase to at least \$82,000,000.

ID 335, 337, 371

In its rebuttal to Coastkeeper's and EHC's comments in this Group Comment, NASSCO stated that it agrees with BAE's comments on this topic, and incorporates those comments into NASSCO's comments.

### **Response 33.2**

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The rebuttal comments of BAE Systems and NASSCO are generally correct and accurately point out the problems with the technical support cited by Coastkeeper and EHC in support of their comments. The polygons excluded from the proposed remedial footprint are consistent with the methodology described in the DTR, and the cleanup of the proposed remedial footprint should ensure that present and anticipated beneficial uses of San Diego Bay are protected.

Specific Polygons mentioned in Coastkeeper's and EHC's comments are discussed below.

#### **POLYGON NA22**

As discussed in the DTR, Section 33, over one dozen sediment samples were collected in the mouth of Chollas Creek area. These samples were analyzed for physical parameters, chemistry, toxicity, and benthic communities. There is substantially more data collected in the mouth of Chollas Creek area as part of the TMDL than was collected in this area during the Shipyard sediment quality investigation, in which only station NA22 was sampled. The decision to remove polygon NA22 from the proposed remedial footprint was due to the fact that substantially more data is available for decision making in the mouth of Chollas Creek at the completion of the TMDL.

The draft implementation plan for the TMDL for the Mouth of Chollas Creek calls for the San Diego Water Board to issue a CAO for the cleanup of contaminated sediment at the mouth of Chollas Creek, including the area encompassed by the polygon associated with station NA22, and portions of the polygons associated with stations NA20 and NA 21. The San Diego Water Board intends to issue this CAO and has put together a staff Cleanup Team to begin drafting the CAO following the San Diego Water Board's consideration of the TMDL for the Mouth of Chollas Creek for adoption. Additional documentation of the San Diego Water Board's intent to require implementation of cleanup actions at the Mouth of Chollas Creek as an integral part of TMDL implementation is contained in the San Diego Water Board funded Sediment Assessment Study for the Mouths of Chollas and Paleta Creek San Diego, Phase 1 Report (SCCWRP and U.S. Navy, 2005; Figure 2-2; SAR 286743).

Polygon NA22 was included in the DTR (Section 31) economic feasibility analysis of cleaning up to background sediment concentrations because at the time of the analysis, the decision to exclude NA22 from the remedial footprint had not been made. Only the portion of polygon NA22 north of the pier is included in the calculation of pre- and post-remedial SWACs. Coastkeeper correctly pointed out that a data line for NA22 appears in the SWAC calculation spreadsheets mentioned in its comment. Only a fraction of the area of polygon NA22 was included, however, in the SWAC calculations. The value of 54,670 square feet in the "area" field for polygon NA22 is only a fraction of its total area of 235,799 square feet. For purposes of post-remediation sampling, this partial area of polygon NA22 should be incorporated into the area of polygon NA20.

## **POLYGONS NA01, NA04, NA07, NA16, SW06, SW18, AND SW29**

The sediment quality triad results (Section 18, p. 18-1 of the DTR) showed that benthic communities are unlikely impacted at stations NA01, NA04, NA07, and SW18. Station NA16 was possibly impacted. This station was re-evaluated using the Multiple Lines of Evidence approach in the Bays and Estuaries Plan with a result that the benthic community at the station was likely unimpacted (DTR p. 32-29). Triad data for station SW06 was collected as part of the study to test the SS-MEQ and 60% LAET thresholds. The WOE station outcome for station SW06 was "unlikely" impacted. Triad data was not available for station SW29, so the SS-MEQ and 60% LAET thresholds for this station was evaluated. Sediment chemistry concentrations at the station was below both thresholds.

Methods for evaluating impacts to fish are discussed in the DTR in Section 15, and in the Appendix to Section 15. The San Diego Water Board applied the weight of evidence approach principles to evaluate potential risks to aquatic life beneficial uses, including impacts to fish, from the existing levels of pollutants at the Shipyard Sediment Site. With respect to fish, the lines of evidence included fish histopathology, and fish bile analyses. Based on those lines of evidence, no adverse effects to fish could be directly attributable to specific chemical concentrations in the sediment. Therefore, the San Diego Water Board did not derive specific chemical-based cleanup levels from the fish histopathology and bile data. Although cleanup levels were not derived from the fish studies, by improving sediment conditions for benthic macroinvertebrates at the Shipyard Sediment Site, the San Diego Water Board expects conditions to improve for the fish that feed on them, as well as for fish that reside on and/or in the sediment..

The DTR fish study results are based on actual data from the site and from reference sites in San Diego Bay, an approach acutally recommended in MacDonald (2009). Further, the MacDonald 2009 analysis is theoretical based on multiple fish species not found at the Shipyard Sediment Site.

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### **RESPONSE 33.3**

**DTR Section:** 33.1.2, Table 33-1, Tables A33-1, A33-2, A33-3

**Comment Submitted By:** BAE Systems

**Comment ID:** 145

#### **Comment**

The DTR used Composite SWAC Ranking Values as one line of evidence for identifying polygons to include in the remedial footprint at the Site. Comment C.2.2 of MacDonald 3/11/11 Expert Report states that "The Composite SWAC Ranking Value provides a consistent, but incomplete, basis for ranking polygons for inclusion in the Proposed Remedial Footprint."

MacDonald states that "the index does not consider the concentrations of other contaminants that could be elevated in sediments from the site. Specifically, lead, zinc, low molecular weight (L)PAHs all exceed toxicity thresholds in surficial sediments at one or more sampling stations." MacDonald then refers the reader to Table A33-3 of the DTR. Because LPAH is not addressed in Table A33-3, the basis of his assertion with respect to that group of chemicals is unclear. Also,

MacDonald does not identify which toxicity thresholds he is referring to when he states that they were exceeded, so the basis of that assertion is also unclear. However, if 60% LAETs are calculated from the LAETs for lead and zinc presented in Table 9-10 of Exponent (2003), the resulting values of 150 and 720 mg/kg, respectively, are not exceeded for any of the polygons that are not included within the remedial footprint, as documented in Table 33-3 of the DTR. Therefore, MacDonald's assertion that lead and zinc exceed toxicity thresholds outside of the remediation footprint is untrue based upon site-specific thresholds calculated in a manner consistent with how the thresholds for the primary COCs were calculated.

In addition to the fact that lead and zinc did not exceed their estimated 60% LAET values outside the remedial footprint, Section 29.3 of the DTR describes how it was verified that secondary COCs, such as lead and zinc, were highly correlated with the primary COCs, to ensure that they would be addressed in a common remedial footprint. Table 29-4 of the DTR shows that both lead and zinc exhibited strong positive correlations with several of the primary COCs. The highest correlations for lead and zinc were found with copper, for which both correlations coefficients were >0.90 (i.e., 0.90 and 0.94, respectively). Therefore, the co-occurrence evaluation conducted in the DTR ensured that the secondary COCs were accounted for in the remedial footprint.

### **Response 33.3**

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The Cleanup Team agrees with this comment. It is important to recognize that contaminants, both primary COCs and secondary COCs, tend to be highly correlated (i.e. co-located with each other) so that remediation of the primary COCs also addresses secondary COCs.

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### **RESPONSE 33.4**

**DTR Section:** 33

**Comment Submitted By:** NASSCO

**Comment ID:** 170

#### **Comment**

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The March MacDonald Report Improperly Interprets Composite SWAC Ranking Values As A Remediation Trigger

In the March MacDonald Report, Mr. MacDonald alleges that the DTR does not adequately explain why ten Shipyard Site stations with Composite SWAC Ranking Values greater than 5.5 were excluded from the proposed remedial footprint.<sup>1</sup> March MacDonald Report, at 11. Although he does not identify the ten stations, it appears that Mr. MacDonald is referring to Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11. See DTR Appendix for Section 33, at Table 33-1 (excluding the five stations identified in DTR, Table 33-6). Accordingly, Mr. MacDonald asserts that the DTR's rationale "for excluding stations with Composite SWAC Ranking Values greater than 5.5 is arbitrary and does not justify the exclusions." Id.

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<sup>1</sup> Mr. MacDonald appears to have picked 5.5 as his cut-off value for Composite SWAC Ranking, because Station NA09's 5.5 Composite SWAC Value is the lowest Composite SWAC Value of all the stations included in the remedial footprint.



Mr. MacDonald's allegation is premised on his assumption that a Composite SWAC Ranking Value of 5.5 or greater alone is a remediation trigger sufficient to include a station in the remedial footprint. This is a foundational misunderstanding of the analysis performed in the DTR. In fact, the station-by-station Composite SWAC Ranking analysis (Section 33.1.2), station-by-station SS-MEQ analysis (Section 33.1.3), and the highest concentrations of individual COCs analysis (Section 33.1.4) were all considered simultaneously, along with Triad data and feasibility issues, to determine the remedial footprint. A brief review of the station-by-station SWAC Composite Ranking analysis found at DTR Section 33.1.2 (and supported by Table 33-1 in Appendix 33), demonstrates that it cannot alone be considered a remediation trigger. For example, if a SWAC Composite Ranking of 5.5 or greater alone had been considered a remediation trigger, then Station NA09 (currently part of the remedial footprint) would have been excluded because its SWAC Composite Ranking is only 5.4. DTR, Appendix for Section 33, at Table 33-1. By the same token, there would be no discussion of Station NA22 with its low SWAC Composite Ranking of only 3.6. *Id.*

Furthermore, based on the weight of the evidence approach employed by the DTR, the ten stations with Composite SWAC Rankings of greater than 5.5 (including Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11) identified were properly excluded from the remedial footprint. In fact:

- None of the ten stations have a SS-MEQ value greater than the 0.90 benchmark. See DTR, Appendix for Section 32, at Table A32-12. In fact, none of the stations have SS-MEQ values of greater than 0.71. *Id.*
- None of the ten stations have high individual concentrations of COCs. See DTR, Tables 33-3, 33-4, and 33-5 (demonstrating that none of the ten stations rank among those stations with the highest concentrations of COCs).
- None of the ten stations exceed the 60% LAET benchmark. See DTR, Table 32-23 (no LAET exceedence for SW29 or SW30); Appendix to Section 32, Table A32-9.
- None of the ten stations have a "Likely" impaired Triad ranking.

Accordingly, it is of no moment that the DTR does not offer an explanation why the ten stations with SWAC Composite Rankings greater than 5.5 (including Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11) are not included in the remedial footprint simply because the SWAC Composite Ranking is not a remedial trigger, and numerous other analyses in the DTR demonstrate why those stations were not included in the remedial footprint.

#### **Response 33.4**

The Cleanup Team agrees with the comment that the SWAC ranking is not a remediation trigger and that the rationale for including or excluding polygons is not based on the SWAC ranking alone but on simultaneously considering a station's Composite SWAC Ranking (Section 33.1.2), station-by-station SS-MEQ analysis (Section 33.1.3), and the highest concentrations of individual COCs analysis (Section 33.1.4).

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### **34. TCA Finding 34 and DTR Section 34: Remedial Monitoring Program**

Finding 34 of CAO No. R9-2011-0001 states:

Monitoring during remediation activities is needed to document that remedial actions have not caused water quality standards to be violated outside of the remedial footprint, that the target cleanup levels have been reached within the remedial footprint, and to assess sediment for appropriate disposal. This monitoring should include water quality monitoring, sediment monitoring, and disposal monitoring.

Post-remediation monitoring is needed to verify that remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. Post-remediation monitoring should be initiated two years after remedy implementation has been completed and continue for a period of up to 10 years after remediation. For human health and aquatic dependent wildlife beneficial uses, post-remediation monitoring should include sediment chemistry monitoring to ensure that post-remediation SWACs are maintained at the site following cleanup. A subset of samples should undergo bioaccumulation testing using *Macoma*. For aquatic life beneficial uses, post-remediation monitoring should include sediment chemistry, and toxicity bioassays to verify that post-remedial conditions have the potential to support a healthy benthic community. In addition, post-remediation monitoring should include benthic community condition assessments to evaluate the overall impact of remediation on the benthic community re-colonization activities.

Environmental data has natural variability which does not represent a true difference from expected values. Therefore, if remedial monitoring results are within an acceptable range of the expected outcome, the remedial actions will be considered successful.

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#### **RESPONSE 34.1**

**DTR Section:** 34

**Comments Submitted By:** NASSCO, BAE Systems, Coastkeeper and EHC

**Comment IDs:** 59, 61, 62, 63, 64, 68, 73, 109, 220, 221, 230, 234, 235, 239, 243, 244, 245, 247, 248, 249, 255, 306, 307, 308, 309, 310, 311, 312, 313, 314, 323, 362, 363, 364, 369, 425, 426, 427, 428, 434

**Comment**

The San Diego Water Board received multiple comments regarding the legality and follow-up requirements for "trigger concentrations" associated with remedial and post-remedial monitoring. Some comments found the trigger concentrations to be inappropriate, while others supported them. Comments against the TCAO specifically focused upon:

1. Remedial and Post-remedial monitoring does not require cleanup levels to be met;
2. Remedial monitoring fails to require achievement of background;
3. 120% trigger could lead to site-wide concentrations above cleanup;
4. The San Diego Water Board cannot legally approve the Order;
5. 120% violates the Order; and
6. Trigger concentrations are compliance levels.

The San Diego Water Board received multiple rebuttal comments on the above comments that were in support of the TCAO and DTR.

In addition, the San Diego Water Board received multiple comments from BAE Systems which, in effect, were critiques of the 2011 MacDonald expert report findings on the development and use of Goals and Triggers during remedial and post-remedial monitoring. These comments generally disagree with the findings of the 2011 MacDonald report. Multiple rebuttal comments from NASSCO were also received in support of BAE Systems initial comments on the MacDonald assessment.

### **Response 34.1**

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In response to the comments and rebuttals regarding the establishment and evaluation process for “Trigger Concentrations” during Remedial and Post-Remedial monitoring, the San Diego Water Board has the following clarifications:

- 1) Resolution No. 92-49 specifies at section II.A.1.e that the discharger must conduct monitoring to confirm short and long term effectiveness of cleanup and abatement. The remediation and post remediation monitoring program as described in the TCAO and DTR are designed to meet this requirement. Some comments are submitted in a context that frames the “Trigger Concentrations” as the only monitoring element, which is incorrect. They are one component of the remedial and post-remedial monitoring program.
- 2) The “Trigger Concentrations” and Post-Remedial “Goals” are not compliance endpoints. In contrast, they are assessment tools that are to be utilized to determine if and what additional measures are needed during and/or after remediation to ensure that the alternative cleanup levels are achieved, and that the cleanup and abatement is effective in the short and long-term.

For remedial dredging, as stated in section B.1 of the directives, the sediment monitoring after the initial dredging must be sufficient to confirm that selected remedial activities have achieved target cleanup levels within the remedial footprint specified in Directive A.2.a. As described in 34.1 of the DTR, concerns with dredging include re-suspension and settling (dredge residuals), as well as sloughing into dredged areas. The purpose of the immediate post-dredge monitoring is to determine the likelihood that the dredged area needs additional measures to meet the concentration levels in the TCAO due to these potential issues. The sole purpose of remedial sediment monitoring is not to determine compliance with concentration levels, as some comments imply, but to determine the necessity of additional measures (e.g. 2nd dredge pass; sand cover) as prescribed in the DTR (Section 34.1.2) to achieve target cleanup levels given the site-specific monitoring results.

Post-remedial dredging incorporates a weight of evidence approach similar to the evaluation conducted to determine the scope of remediation at the shipyard site. The lines of evidence include sediment chemistry, toxicity, and bioaccumulation. The “Trigger Concentrations” are one of two sediment chemistry evaluation tools and one of the four total evaluation tools utilized in the weight of evidence approach for the goals.

An important aspect of the dredging that some comments fail to mention involves the work done to date to determine depth levels of dredging required to meet background concentrations (see DTR Section 33.1). The combination of these calculations, active dredge footprint monitoring during dredging operations, and post dredge remedial monitoring is expected to work together to confirm the short and long term success of the cleanup and abatement in accordance with Resolution No. 92-49.

- 3) The “Trigger Concentrations” were developed to incorporate the expected natural sampling variability. The incorporation of this variability is appropriate to prevent a Type I error in assessment of the cleanup. Again, it is important to clarify that the TCAO requires alternative cleanup levels be met and that “Trigger Concentrations” are not a compliance endpoint in this determination. This is clear in TCAO Finding 34, which states:

“Environmental data has natural variability which does not represent a true difference from the expected values. Therefore, if remedial monitoring results are within an acceptable range of the expected outcome, the remedial actions will be considered successful.”

In regards to comments on the trigger level for mercury, there are two main points of consideration. First, the polygons being remediated have elevated mercury levels, so it is unclear how the removal of mercury will allow the dischargers to increase or not remove concentrations of Mercury. Second, the post-remedial trigger incorporates the variability expected following remediation activities, which is based upon pre-remedy SWAC variability in non-remedial sites. This variability is not reflected in the pre-remedy SWAC cited in Comment ID 68 (see Appendix B, Comment ID 68). Table 33-8 reflects this information.

- 4) Lastly, the San Diego Water Board retains discretion to review and approve progress reports, require changes in remedial and post-remedial monitoring, and approve the cleanup and abatement completion. This is clearly laid out in Directive F of the CAO.

The Cleanup Team generally agrees with the comments and rebuttal comments that focused upon the 2011 MacDonald report assessment of Trigger Concentrations and Goals. The Trigger Concentrations, Goals, and response criteria are reasonable and appropriate, and are consistent with Resolution No. 92-49. The Cleanup Team also offers the following clarifications in response:

- 1) The sampling methods for triggers/goals utilized are the same as those used to determine impairment and remediation within the polygons.
- 2) The assessment utilizes a multi-step process to ensure the remediation is a success, including pre-dredge calculations, remedial dredge monitoring, and post-remedial monitoring. The post-remedial monitoring also occurs over a 10 year time period.
- 3) The assessment includes a SWAC approach AND weight of evidence approach to determine the short and long-term success of the remediation on a site-wide basis as well as within and

among polygons. This is expected to verify that remaining pollutants do not unreasonably impact human health and aquatic dependent wildlife.

- 4) The Triggers and Goals incorporate flexibility for the dischargers to propose, for San Diego Water Board review and approval, what additional follow-up actions may be necessary if a trigger is exceeded and/or a goal is not met during the course of remedial or post-remedial monitoring. This flexibility is important as the project is likely to proceed in a phased manner due to other regulatory permitting and shipyard activities. Furthermore, the project will be carried out at different water depths, will occur adjacent to essential fish habitat, and may encounter differing engineering challenges and requirements.
- 5) The San Diego Water Board will review the remedial monitoring plan and may direct the dischargers to modify or suspend cleanup activities at any time during the remediation process. The San Diego Water Board will also review the required final cleanup and abatement completion report (see Directives A-D).
- 6) The San Diego Water Board will review the post-remedial monitoring plan and may implement any conditions in regards to sampling. The San Diego Water Board will also review the post-remedial monitoring reports, and will review any trigger exceedance investigation and characterization reports (see Directive F).
- 7) The San Diego Water Board retains discretion in approving the Final Cleanup and Abatement Completion Report and Post Remedial Monitoring Reports.

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## RESPONSE 34.2

**DTR Section:** 34

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 65, 81, 82, 84, 112, 203, 215, 204, 208, 209, 210, 211, 212, 213, 214, 216, 217, 222, 223, 251, 252, 253, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 352, 353, 431

**Comment**

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The Remedial Monitoring comments focused on the level of specificity for monitoring in the DTR, and on what BMPs are needed during the actual remedial dredging process. For example, Comment ID 82 (See Appendix B, Comment ID 82) and statements in MacDonald (2011) call for more specificity (naming specific water quality standards, BMPs, etc..) in the DTR, while opposing comments and rebuttal comments focus on the requirement of the TCAO to submit a proposal to the San Diego Water Board for these activities.

The San Diego Water Board received multiple initial comments from BAE Systems that, in essence, provided rebuttal commentary on specific statements found in MacDonald (2011), which is cited in Coastkeeper/EHC comments regarding the level of specificity in the DTR for Remedial Monitoring. However, the findings in MacDonald (2011) were not submitted by Coastkeeper/EHC as specific comments. EHC/Coastkeeper comments do cite MacDonald (2011), but not specific text or sections. NASSCO and BAE Systems also submitted rebuttal comments generally in support of the approach in the DTR and of TCAO requirements.

### **Response 34.2**

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The Cleanup Team generally agrees with the comments and rebuttals that support the requirement that remedial monitoring specifics need to be included within the remedial monitoring plan when submitted to the San Diego Water Board for review. This approach is reasonable and the Cleanup Team provides the following additional clarifications:

The TCAO and DTR prescribe a baseline expectation of required water quality and sediment monitoring during the remedial dredge and fill activities (citing 2 general approaches for water quality monitoring). Thus, the approach taken in the TCAO and DTR is reasonable given the regulatory process. It is important to note that the scope, scale, timing, and regulatory process of the cleanup and abatement makes specific site prescriptions (i.e. specific BMPs, calling out specific water quality standards, construction area size, number of samples etc.) within the DTR infeasible and unnecessary. The cleanup and abatement may take place in different phases, will occur at varying depths, and involves both independent and co-dependent dredge and fill activities. Thus, the water quality and sediment monitoring requirements include sufficient flexibility to allow the dischargers to propose a monitoring program that is consistent with the TCAO, protects water quality standards, addresses site specific conditions, factors in multiple phases and sites required for remediation, and allows for regulatory input and requirements by resource agencies.

In terms of regulatory requirements, the cleanup and abatement is required to undergo additional environmental review and permitting processes which will influence the remedial monitoring plan design. The cleanup and abatement “project” is required to undergo CEQA, which will require specification of mitigation measures needed to reduce impacts to less than significant levels. Additionally, the project will require permits under the Clean Water Act (Section 401 and 404 and associated consultations) for the discharge of dredge and fill materials. These permits will condition site-specific mitigation measures for the project, such as BMPs, monitoring, and habitat mitigation. Thus, the level of description in the DTR and the requirement for submittal of a remedial monitoring plan is appropriate given the project itself and to prevent conflict with existing regulatory requirements.

Some comments favor the TCAO requiring real-time monitoring of the primary and secondary pollutants of concern to prevent the “masking” of pollutants. While such a monitoring scenario would be ideal, it is unrealistic and unreasonable due to analysis times. Further, it is unnecessary as turbidity serves as a proxy for sediment contaminant of concern detection. Contaminated sediments in depositional environments are primarily fine-grained (such as at the Shipyard Sediment Site), and contaminants associated with the sediments tend to remain tightly bound to particles, making the control of sediment resuspension important in controlling contaminant release (U.S. Army Corps of Engineers, 2008). Furthermore, sediment remediation case studies that utilized periodic contaminant of concern monitoring (mainly PCBs and PAHs) have shown that if turbidity during dredging is controlled, then the sediment-related contamination is also controlled (U.S. EPA, 2004). Thus, real-time dissolved oxygen and turbidity monitoring are appropriate for remediation monitoring.

For clarification, the TCAO does not allow dischargers to “abandon” daily real-time water quality monitoring if no samples exceed for 3 days in a row. The frequency of real-time

monitoring may be reduced to weekly, and visual turbidity monitoring would likely still be required.

In regards to comments regarding the sampling protocols within individual polygons, the approach required in the DTR is reasonable to meet the monitoring requirements under Resolution No. 92-49. While replication sampling within each polygon would provide additional information following the dredging, the TCAO and DTR sampling approach is reasonable and incorporates an estimate of variability within the process while also addressing temporal sediment movement. It is unclear how targeting historic sampling sites that will be remediated will detriment this process, as the remedial monitoring should assess the success of the remediation and there is value in pre and post data collection. Again, the San Diego Water Board will also review the Remediation Plan prior to implementation (TCAO Directive B.2). For sand placement, the DTR specifies that sand placement will be evaluated by the dischargers following monitoring results with confirmation with the San Diego Water Board (via TCAO Directive B.3).

EHC/Coastkeepers Comment ID 84 (See Appendix B, Comment ID 84) regarding the impossibility of the sediment sampling is confusing and difficult to interpret. The referenced section (MacDonald, 2011 at p. 25) directly quotes sampling requirements that are presumably from section 34 of the DTR but cannot be found in the DTR. It is presumed that the comment is concerned with the accuracy of remedial sediment sampling following the dredging. DTR Section 34.1.2 specifically describes the sampling expectations and requirements, which include coordination between the dredge operator and sampling team. The DTR states that the undisturbed depth will "be determined based upon the accuracy to which the dredge operator can guarantee the depth to which they dredge." The DTR also lays out decision rules in the evaluation of sampling and defines subsurface depths. These specific methods proposed by the dischargers will also be reviewed by the San Diego Water Board. Thus, the sampling is not considered to be "impossible" to conduct.

The monitoring approach in the TCAO and DTR does not prevent the San Diego Water Board or dischargers from assessing impacts from the remedial dredging, nor does it limit the ability to determine if additional actions and/or remedial measures need to be taken during the dredging to protect water quality standard while simultaneously conducting the cleanup and abatement.

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### RESPONSE 34.3

**DTR Section:** 34

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 65, 218, 219, 349

**Comment**

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ID 65

Coastkeeper and EHC commented that the "120% of background" decision rule for a second dredging pass is ambiguous. In addition to violating the requirement that the alternative cleanup levels must be concentration limits, the language in the Order setting the 120% background level allowance leaves open the possibility that every Contaminant of Concern had to exceed 120% of background in order to warrant a second dredging pass. (See Order Directive A.2.a) This would

allow for a situation when one or more of the pollutants were significantly above background concentrations, but if one pollutant was at or below 120% of background, that no additional dredging would be required. This would lead to even more egregious violations of the alternative cleanup levels. See MacDonald 2011 at p. 25.

ID 218, 219

BAE Systems responded to MacDonald 2011 comments regarding deficiencies of the remediation monitoring requirements – Sediment. BAE Systems commented that MacDonald's statement that "The TCAO and the DTR provide inconsistent requirements on sampling depth" is premature and unsupported. Any inconsistencies regarding sampling depth will be resolved when the Remediation Monitoring Plan is prepared.

BAE Systems responded to the MacDonald 2011 comment that "the DTR should specifically require that samples be collected within the top 10 cm" stating that it is premature and unsupported. The sediment sampling depth for remediation monitoring will be finalized when the Remediation Monitoring Plan is prepared and reviewed by the Regional Board.

ID 349

NASSCO noted Coastkeeper's and EHC's comment that the Order and DTR provide inconsistent sampling requirements; the Order requires that samples be collected deeper than the upper 5cm, while the DTR requires that samples be collected deeper than the upper 10cm. NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 66.

### **Response 34.3**

In response to comments regarding the sampling depth and trigger process during remedial monitoring, the TCAO Directive A.2.a and DTR at 34.1.2, p. 34-3 will be revised as follows:

"If the concentration of any primary COC in subsurface sediments (deeper than the upper 5 cm) is above 120 percent of the post-remedial dredge area concentration after completion of initial dredging, then additional sediments shall be dredged by performing an additional "pass" with the equipment."

The phrase "deeper than the upper 10 cm" stated in DTR at 34.1.2, Page 34-3 was a typographical error in the DTR. The 10 cm sampling depth interval was evaluated for the remedial monitoring, but rejected in favor of 5 cm (as reflected in the TCAO). The 5 cm depth is consistent with the Field Procedures for sediment sampling in the Bays and Estuaries Plan (SWRCB, 2009; p. 4, Sections V.D.3 and 4). This revision will be provided on September 15, 2011, as required by the Third Amended Order of Proceedings.

Please see Response 34.1 above in regards to comments and responses regarding the conditions that would trigger an additional "pass" with dredging equipment described in TCAO Directive A.2.a and DTR at 34.1.2, p. 34-3 .



## **RESPONSE 34.4**

**DTR Section:** 34

**Comments Submitted By:** NASSCO, BAE Systems, SDG&E, Coastkeeper and EHC

**Comment IDs:** 66, 70, 71, 72, 86, 113, 191, 205, 206, 224, 225, 226, 227, 228, 229, 231, 232, 233, 236, 237, 238, 240, 241, 242, 246, 254, 315, 316, 317, 318, 319, 320, 321, 322, 354, 355, 356, 357, 358, 359, 360, 361, 372, 373, 432, 437

### **Comment**

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The San Diego Water Board received multiple comments in favor and against the design and requirements of the post-remedial monitoring program. These primarily focused upon:

1. Sediment sampling depth;
2. Appropriate number and location of triad stations;
3. Number and selection of bioaccumulation stations;
4. Lack of consideration of secondary COCs in the post-remedial sampling;
5. Benthic community sampling methods and lack of a specific benthic community trigger;
6. Exclusion of site NA22 from monitoring; and
7. SWAC monitoring.

BAE Systems also submitted comments against findings in MacDonald (2001) that the amount of post-remedial data collected was insufficient. Subsequent rebuttal comments were received in support of the post-remedial monitoring design as depicted in the TCAO and DTR:

In addition, the San Diego Water Board received multiple comments from BAE Systems which, in effect, were critiques of the MacDonald (2011) expert report findings on the SWAC approach for post-remedial monitoring. Multiple rebuttal comments from BAE Systems and NASSCO were also received regarding the MacDonald critique of the SWAC approach.

### **Response 34.4**

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The Cleanup Team received numerous comments regarding the specifics and sufficiency of the post-remedial sampling. The objective of the post-remedial monitoring is to verify that remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. This is consistent with the requirement for long term monitoring required under Resolution No. 92-49 to confirm the effectiveness of the cleanup. Although some commenters suggest a different approach, the monitoring approach described in the TCAO and DTR is reasonable and sufficient to adequately evaluate the short and long-term effectiveness of the cleanup. The Cleanup Team agrees in principle that the collection of additional data could provide additional information regarding the remediation success as suggested by some commentors. However, the TCAO monitoring requirements have been structured in a considered and reasonable manner that compares pre-remediation and post-remediation assessments to assist in the evaluation of the short and long-term success of the remediation. Additional analysis and sampling investigation may be conducted based upon exceedances of specified post remedation trigger concentrations and attainment of remedial goals incorporated in the TCAO Directives D-F.

With the proper implementation of mitigation measures, the potential for resuspension, transport, and deposition of fine sediment during remediation dredging activities will be mitigated to less than significant levels and subsequently assessed over the long-term under the post remedial monitoring program. The selection of the nine sampling stations along the length of the remedial footprint for bioaccumulation testing was not arbitrary (see DTR Section 34.2.1) and will be used in a weight of evidence approach with other data and factors to evaluate the short and long-term success of the cleanup and abatement and attainment of TCAO remedial goals (see also Response 34.4 above). It is the responsibility of the dischargers to meet the remedial goals required in the TCAO directives. If, at any time during the 10-year post remediation monitoring period, monitoring data and follow-up studies indicate that the cleanup levels are not maintained, the San Diego Water Board will require further corrective action (see TCAO Directives D.5 and F).

### **Sediment Sampling Depth**

Most of the sediment chemistry samples from the sediment quality investigation (Exponent, 2003) were from the 0-2 cm depth interval. The TCAO requires post-remediation monitoring samples be from the 0-2 cm depth sample for confirmation that post-remedial SWACs have been achieved, and for the purpose of assessing post-remediation benthic community conditions.

Post-remediation sediment sampling at the 0-2 cm depth interval will enable post-remediation comparisons to pre-remediation sediment chemistry conditions. This depth interval also is an indicator of residual sediment re-contamination for both remediated and non-remediated polygons. In regards to comments on sampling the biologically active zone, the post-remedial monitoring requires sampling of the benthic community in years 3 and 4 to provide a qualitative assessment of the re-establishment of benthic organisms at selected sites within the remedial footprint area. (See DTR Sections 32.2.3 and 32.2.4)

### **Use of 5 Triad Stations**

The Cleanup Team generally agrees with the rebuttal comments from BAE Systems regarding the adequacy and supporting rationale for the 5 sample stations. For clarification, there were 6 stations identified in the DTR (Section 18), though one (NA22) was excluded due to overlap with a TMDL evaluation area (see Table 18-1). DTR Section 34.2.3 states:

"The purpose of assessing benthic community conditions as part of post-remedy monitoring is to demonstrate the remediation will successfully create conditions that would be expected to promote recolonization of a healthy benthic community. This objective will be evaluated by collecting surficial sediment samples (0-2 cm interval) from selected stations within the remedial footprint where pre-remedial Triad analysis showed likely effects on benthic receptors. Chemistry and toxicity tests will be performed on these samples to determine if they are likely to have effects on benthic receptors."

Thus, the use of these 5 stations is appropriate to measure attainment of TCAO remedial goals. It should be noted that SWAC, bioaccumulation, and benthic community sampling occurs inside AND outside of remedial areas and will be to assess if pollutant concentrations in non-remedial areas has been maintained.

### **Bioaccumulation**

The selection of the 9 stations for post remedial bioaccumulation testing is described in DTR Section 34.2.1 as being the sites where bioaccumulation was initially conducted to determine if conditions have been maintained and improved. The nine sediment samples will undergo bioaccumulation testing using the same 28-day *Macoma nasuta* test used in the pre-remedial site assessment. Thus comparisons with pre-remedial bioaccumulation levels can be made and trends can be determined over time. Of the nine stations, the majority (7) lie inside remedial footprint areas with the remaining stations (2) being directly adjacent or close to remediated polygons. Additionally, the 9 stations are distributed along the entire length of the remedial footprint. Thus, the bioaccumulation stations may be evaluated to see if bioaccumulation trends in 1) remediated footprint areas are decreasing and 2) non-remedial areas have not gotten worse. The purpose of the post-remedial bioaccumulation monitoring is not, as some comments imply, to conduct a post-remedial aquatic life and human health risk assessment. The specific bioaccumulation remedial goals specified in TCAO Directive D.3.c at pp. 28 and 29 are designed to document that bioaccumulation levels are responding to the sediment remediation and are showing a decreasing trend at two years post-remediation and that this decreasing trend continues at year five post-remediation and, if determined necessary, at year ten post-remediation. The post remedial bioaccumulation evaluations described in DTR Section 34.2.1. is designed appropriately for the intended use.

### **Secondary COCs**

Additional post remedial SWAC trigger concentrations are not needed for secondary contaminants due to the relationship of secondary contaminants to primary described in DTR Section 29. Furthermore, the selection process for remediation of contaminants did evaluate secondary contaminants of concern, and the post-remedial monitoring SWAC and goals will identify if a secondary contaminant of concern is preventing short and/or long term goals of the cleanup and abatement from being achieved.

### **Benthic Community Triggers**

The San Diego Water Board included benthic invertebrate community sampling solely as a qualitative measure to assess the benthic recolonization of bay sediments following remediation. The benthic community measurements will not be used to evaluate the success of the remedial action. Due to the natural variability in benthic colonization, as well as the variability of Shipyard Sediment Site conditions (depth, habitat types, disturbances, etc...) it is not reasonable to include a specific benthic community trigger.

### **Polygon NA22 Inclusion**

The polygon associated with Station NA22 has been excluded from the Shipyard Sediment Site remedial footprint and will instead be further assessed as part of the TMDL effort for the Chollas Creek mouth (DTR Section 33.1.1.) This is a reasonable and appropriate approach because substantially more data was collected in the Chollas Creek Mouth area as part of the TMDL than was collected during the Shipyards sediment study, in which one sample was collected at Station NA22. Further, station NA22 is located in an area where propeller testing occurs routinely. Thus physical impacts could be causing the impaired benthic conditions found at NA22, rather

than chemically induced impacts. The additional samples from the TMDL will allow a better assessment of the causes of potential impairment in the mouth of Chollas Creek area which will allow a more effective cleanup decision to be made. Polygon NA22 should not be included in the remedial footprint simply because it is considered to be “within” the Shipyard Site. For more discussion please see Response 33.2.

### **SWAC Approach**

The Cleanup Team does not agree with EHC/Coastkeeper in Comment ID 70 (See Appendix B, Comment ID 70), that the collection of 65 samples represents a paltry sum and that the purpose of the compositing is to mask pollutants and guarantee that no additional action is taken. This conflicts with Coastkeeper’s and EHC’s next comment (ID 71), which states that the CAO does not require each polygon to be sampled. Coastkeeper and EHC do not appear to understand the actual post-remedial sampling requirements. As stated in DTR Section 34, post-remediation monitoring is needed to verify that remaining pollution concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. The analysis of levels of pollutants attributed to each specific polygon is not required unless an exceedance of the SWAC is documented under TCAO Directive D.4. The purpose of the SWAC approach is to evaluate whether the clean-up goals have been attained for the whole site. The Cleanup Team expects the toxicity and bioaccumulation post-remedial monitoring to address the concerns raised by the commenter regarding organisms that are sessile or have small home ranges.

It should be noted that the “success” of the clean-up will rely heavily upon multiple factors beside data from the polygons not dredged (see also Response 34.1 above). However, the data from those polygons not dredged is indeed important to ensure that sediment quality is maintained at non-dredge sites during and following the remedial dredging. Thus, the six sampling areas are spaced based upon proximity to remedial dredging utilizing the Thiessen Polygons (see DTR Section 32.2.2). DTR Section 34.2.1 states: “Post-remediation monitoring is intended to verify that remediation was effective in reducing and maintaining pollutants in sediments at levels that do not unreasonably impact human health and aquatic-dependent wildlife.” Again, this is consistent with the monitoring requirements under Resolution No. 92-49. The polygons were divided into groups that are:

- Dredged;
- Adjacent to Dredged Areas; and
- At the furthest distance from dredged areas.

The 6 composite samples can thus be evaluated to demonstrate that :

- Remediation in dredged areas was effective in reducing pollutants in sediments at levels that do not unreasonably impact human health and aquatic-dependent wildlife beneficial uses.
- Remediation in dredged areas was effective in preventing migration of contaminants, thus maintaining pollutants in adjacent and furthest distance sediments at levels that do not unreasonably impact human health and aquatic-dependent wildlife beneficial uses.

In regards to Comment ID 72 (See Appendix B, Comment ID 72), the TCAO is clear in Directives D.1.c.3 and 4 which provide that:

“The average concentration of the each of the six composites shall be calculated from the analytical results of the replicates for each COC.”

“The three replicate subsamples of composite samples provide an estimate of variances in the compositing process.”

Comment ID 72 also misquotes DTR Section 34.2.1, which states: “Post-remediation monitoring is intended to verify that remediation was effective in reducing and maintaining pollutants in sediments at levels that do not unreasonably impact human health and aquatic-dependent wildlife.”

In regards to consistency with the original SWAC determinations, EHC/Coastkeeper comments do not recognize some of the purposes of assessing the post-remedial condition utilizing a SWAC approach. While the Cleanup Team is concerned with the post-remediation contaminant concentration levels achieved in dredged areas, the SWAC approach was selected, in part, to ensure that dredging residuals and suspended sediments did not re-settle into non-remedial areas, and that natural sediment migration following remediation activities did not result in significant increases in pollutant concentrations in non-remedial areas. Furthermore, it is important to note that the sediment chemistry concentrations at depth for each polygon have already been evaluated to determine depth of dredging to remediate to background. Active dredge footprint monitoring and remedial monitoring is expected to confirm concentration remediation within the dredged areas.

#### **Comments and Rebuttal Comments on the MacDonald (2011) Report (MacDonald's critique of SWAC and amount of data collected)**

The Cleanup Team generally agrees with the comments supporting the SWAC approach, including the six groups, compositing, and archiving of 65 samples, which as discussed above is a reasonable and appropriate evaluation approach that is consistent with Resolution No. 92-49.

It is also important to note, as some of the comments and rebuttals state, that the SWAC is not the only post-remedial assessment of the short and long-term success of the remediation. Comments received that were not in favor of the SWAC approach did not acknowledge the overall post-remedial monitoring weight-of-evidence approach discussed above. In this respect those SWAC comments are, to a certain extent, taken out of context..

The Cleanup Team generally agrees with the comments regarding the necessity, reliability and breadth of data collected during the post-remediation related to the alternative cleanup levels. The TCAO and DTR describe a combined remedial and post-remedial monitoring approach that is adequate to successfully verify that the remediation was effective in reducing and maintaining pollutants in sediments at concentrations that will not unreasonably affect San Diego Bay beneficial uses. The monitoring approach incorporates expected variability, requires response measures associated with monitoring phases and types, provides multiple lines of evidence, and is altogether a reasonable approach that is consistent with Resolution No. 92-49.

## RESPONSE 34.5

**DTR Section:** 34

**Comments Submitted By:** NASSCO

**Comment IDs:** 157

### **Comment**

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The Remedial Monitoring and Post-Remedial Monitoring Programs are unprecedented compared to other sediment remediation projects throughout SD Bay, and California (Findings 34, 36).

Staff has also proposed extensive remedial and post-remedial monitoring programs that are far more stringent than those required for other similar sediment remediation projects in San Diego Bay. Gibson Depo, at 103:23 – 104:12, 133:17 – 135:7 (testifying that the remedial and post-remedial monitoring programs described in the TCAO and DTR are more extensive than any other projects in San Diego Bay). For example, the Regional Board has never before required the implementation of a five- to ten-year post-remedial monitoring plan for a site not involving an engineered cap.

In sum, by requiring significantly more stringent cleanup levels and monitoring programs for NASSCO and failing to regulate NASSCO in the same manner as other similarly situated shipyards and boatyards, the TCAO violates the consistency requirement expressly stated in Resolution 92-49, as well as principles of due process and equal protection

### **Response 34.5**

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NASSCO's equal protection argument lacks merit. The San Diego Bay sediment cleanup sites referenced by NASSCO were ordered by the San Diego Water Board between the years 1985 through 1998. As evidenced by the DTR, the advances in data collection, analytical techniques and analytical tools since that time are substantial. Resolution No. 92-49 does not mandate the regional water boards remain stuck in time, nor that they cannot use scientific advances with respect to understanding beneficial use impairment, with respect to emerging remediation technologies, and with respect to analyzing the effectiveness of alternative cleanup levels greater than background through the remedial and post-remedial monitoring programs described in the TCAO and DTR. Resolution No. 92-49 merely provides that the regional boards are to prescribe cleanup levels which are consistent with analogous discharges that involve similar wastes, site characteristics and water quality considerations, not that alternative cleanup levels or remedial and post-remedial monitoring programs must be identical for all cleanups (See Section II (A)(9)).

Achieving the intended water quality benefits of the proposed TCAO remedial action in terms of anticipated improvements in the marine sediment environment at the Shipyard Sediment Site is of primary importance. That is true for the San Diego Water Board who is requiring cleanup of the Site, the parties responsible for funding the cleanup, the anglers, boaters and others, who may be directly affected by the contamination and the San Diego community at large which has a primary interest in ensuring that the quality of San Diego Bay waters is protected for the use and enjoyment of the people of the state. Remedial and post-remedial monitoring is the only way to evaluate the Shipyard Sediment Site cleanup's success in reducing risk and ensuring that the

remediation objectives have been met and is therefore an essential part of the cleanup remedy proposed in the TCAO.

Accordingly, monitoring during remediation activities (referred to as “remediation monitoring”) is required under the TCAO to document that remedial actions have not caused water quality standards to be violated outside of the remedial footprint, that the target cleanup levels have been reached within the remedial footprint, and to assess sediment for appropriate disposal. Post-remediation monitoring is required under the TCAO to verify that remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses

NASSCO correctly points out that the San Diego Water Board did not require extensive remedial and post-remediation monitoring at previous San Diego Bay sediment cleanup sites not involving an engineered cap. As a result of that approach, the basic monitoring information needed to evaluate long term trends at the remediation sites was not collected. This in turn prevented the San Diego Water Board and others from determining the long term success of the cleanup projects in protecting beneficial uses. This situation was not unique to the San Diego Water Board’s contaminated sediment cleanup sites. A recent study by the National Research Council concluded that post remediation monitoring at most federal Superfund sites involving contaminated sediment cleanup has to date been largely inadequate to determine whether dredging has been effective in achieving remedial objectives. (NRC, 2007)

It has been over 15 years since the San Diego Water Board ordered the last San Diego Bay sediment cleanup. During that period the San Diego Water Board has determined that short and long term remediation monitoring is an essential component of TCAO actions on contaminated sediment. This is consistent with U.S. EPA guidance which states “most sites where contaminated sediment has been removed also should be monitored for some period to ensure that cleanup levels and RAOs [remedial action objectives] are met and will continue to be met” (U.S. EPA 2005a, p. 2-17). This is also consistent with the requirements of Resolution No. 92-49 which directs the regional water boards to direct dischargers to implement monitoring to confirm short- and long-term effectiveness of cleanup and abatement. (See II.A.e.)

Additional perspective on the level of remediation monitoring proposed in the TCAO Directive D and DTR Section 34.2 can be obtained by comparing the scale of the proposed Shipyard Sediment Site remediation with past projects conducted to date. A total of 9 remedial sediment projects have taken place in San Diego Bay, with 339,600 cubic yards of sediment remediated either via dredging removal or capping. By comparison, the TCAO and DTR require the remediation of roughly 143,400 cubic yards of sediment (over 17.5 acres), which is over 42 percent of the contaminated sediment cubic yardage remediated to date in San Diego Bay in the last 20 years. The Shipyard Sediment Site remediation will use a variety of techniques to achieve remedial action objectives including direct removal, natural attenuation, and sand cover placement (See DTR Section 35.3). Each remedial technique requires monitoring to determine its success in achieving objectives. The site remediation is also scheduled to take up to five years to complete (See DTR Figure 35-1), which extends the time for remedial monitoring simply due to the length of time over which dredging will occur. Taking into consideration the size, length, and methodologies utilized for the remediation, the level of post-remediation monitoring required under TCAO Directive D is appropriate to protect water quality and

determine the short and long-term success of the remediation.

The objective of the post-remediation monitoring referenced in NASSCO's comment is to further verify that remaining pollutant concentrations in the sediments after remediation will not unreasonably affect San Diego Bay beneficial uses. (See DTR Section 34.2) Post-remediation monitoring will be initiated 2 years after remedy implementation has been completed and will continue for a period of up to 10 years after remediation. The TCAO has provisions to discontinue post-remediation monitoring at the five years post-remediation mark if the expected trend of exposure and risk reduction described in the Year 5 remedial goals are met (See TCAO Directive 3). Depending upon the post-remedial monitoring results, certain measures may need to be taken if the 5 year goals are not met, and the 10-year monitoring event is expected to assess their success.

This type of post-remediation review at 5-year intervals is fully consistent with U.S. EPA's post remedial monitoring of remedies at Superfund sediment sites which are typically subject to review at 5-year intervals when, following remediation, contamination exists that could limit potential uses of the site. This could occur for several reasons: residual contamination after the completion of the remedial action, the recontamination potential associated with the dynamic nature of the aquatic environment, the fact that some sources may be undetected and that controls of known sources are not always implemented concurrently with the remedy (particularly at the watershed level), and the additional time required by remedies to achieve objectives that must counter past bioaccumulation of contaminants in the food chain.

It is also important to note that other Regional Water Board water quality programs require long-term 5-10 year monitoring to document project success. For example, the Total Maximum Daily Load for PCBs, pesticides, and sediment toxicity in McGrath Lake (Los Angeles Water Board Resolution No. R09-006) requires 10 years of monitoring to determine if remedial actions are successful and if water quality standards have been attained.

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### **35. TCA Finding 35 and DTR Section 35: Remedial Action Implementation Schedule**

Finding 35 of CAO No. R9-2011-0001 states:

The dischargers have proposed a remedial action implementation schedule and a description of specific remedial actions they intend to undertake to comply with this CAO. The remedial action implementation schedule will begin with the adoption of this CAO and end with the submission of final reports documenting that the alternative sediment cleanup levels have been met. From start to finish, remedial action implementation is expected to take approximately 5 years to complete.

The proposed remedial actions have a substantial likelihood to achieve compliance with the requirements of this CAO within a reasonable time frame. The proposed schedule is as short as possible, given 1) the scope, size, complexity, and cost of the remediation, 2) industry experience with the time typically required to implement similar remedial actions, 3) the time needed to secure other regulatory agency approvals and permits before remediation can start, and 4) the need to conduct dredging in a phased manner to prevent or reduce adverse effects to the endangered California Least Tern. Therefore, the remedial action implementation schedule proposed by the dischargers is consistent with the provisions in Resolution No. 92-49 for schedules for cleanup and abatement.

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The San Diego Water Board did not receive any comments on Finding 35 and DTR Section 35.

### **36. TCAO Finding 36 and DTR Section 36: Legal and Regulatory Authority**

Finding 36 of CAO No. R9-2011-0001 states:

This Order is based on (1) section 13267 and Chapter 5, Enforcement, of the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with section 13000), commencing with section 13300; (2) applicable state and federal regulations; (3) all applicable provisions of statewide Water Quality Control Plans adopted by the State Water Resources Control Board and the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) adopted by the San Diego Water Board including beneficial uses, water quality objectives, and implementation plans; (4) State Water Board policies for water quality control, including State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California* and Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304*; and (5) relevant standards, criteria, and advisories adopted by other state and federal agencies.

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The San Diego Water Board did not receive any comments on Finding 36 and DTR Section 36.

### **37. TCAO Finding 37 and DTR Section 37: CEQA Review**

Finding 37 of CAO No. R9-2011-0001 states:

In many cases, an enforcement action such as this could be exempt from the provisions of the California Environmental Quality Act (“CEQA”; Public Resources Code, section 21000 et seq.), because it would fall within Classes 7, 8, and 21 of the categorical exemptions for projects that have been determined not to have a significant effect on the environment under section 21084 of CEQA.<sup>49</sup> In Resolution No. R9-2010-0115 adopted on September 8, 2010, the San Diego Water Board found that because the tentative CAO presents unusual circumstances and there is a reasonable possibility of a significant effect on the environment due to the unusual circumstances, the tentative CAO is not exempt from CEQA and that an EIR analyzing the potential environmental effects of the tentative CAO should be prepared.

As the lead agency for the tentative CAO, the San Diego Water Board prepared an EIR that complies with CEQA. The San Diego Water Board has reviewed and considered the information in the EIR.

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The San Diego Water Board did not receive any comments on Finding 37 and DTR Section 37.

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<sup>49</sup> Title 14 CCR sections 15307, 15308, and 15321.

### **38. TCAO Finding 38 and DTR Section 38: Public Notice**

Finding 38 of CAO No. R9-2011-0001 states:

The San Diego Water Board has notified all known interested persons and the public of its intent to adopt this CAO, and has provided them with an opportunity to submit written comments and recommendations.

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The San Diego Water Board did not receive any comments on Finding 38 and DTR Section 38.

### **39. TCAO Finding 39 and DTR Section 39: Public Hearing**

Finding 39 of CAO No. R9-2011-0001 states:

The San Diego Water Board has considered all comments pertaining to this CAO submitted to the San Diego Water Board in writing, or by oral presentations at the public hearing held on **[date(s) to be inserted]**. Responses to relevant comments have been incorporated into the Technical Report for this CAO. In the event that the San Diego Water Board proposes any changes to the Tentative CAO deemed material by the Dischargers, the Dischargers reserve their right to complete the administrative process delineated in the Final Discovery Plan and Second Amended Order of Proceedings, including the rights to conduct discovery, to cross-examine witnesses, and to submit rebuttal evidence, comments and initial and final briefs, subject to revised deadlines to be set by the San Diego Water Board or its designated Presiding Officer.

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The San Diego Water Board did not receive any comments on Finding 39 and DTR Section 39.

#### **40. TCAO Finding 40: Technical Report**

Finding 40 of CAO No. R9-2011-0001 states:

The “*Technical Report for Cleanup and Abatement Order No. R9-2011-0001 for the Shipyard Sediment Site, San Diego Bay, San Diego, CA*” is hereby incorporated as a finding in support of this CAO as if fully set forth here verbatim.

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The San Diego Water Board did not receive any comments on Finding 40.

## **41. DTR Section 40: References**

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The San Diego Water Board did not receive any comments on DTR Section 40.

## **42. REFERENCES CITED IN RESPONSE TO COMMENTS**

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## **APPENDIX**

### **1. All Comments Received**

Please see enclosed CD or the below link:

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/shipyards\\_sediment/2005\\_0126\\_adt.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/shipyards_sediment/2005_0126_adt.shtml)

## **APPENDIX A**

## **CLEANUP TEAM QUALIFICATIONS RELEVANT TO ASSUMPTIONS AND ANALYSES IN THE TCAO/DTR**

- **David W. Gibson – Executive Officer**

Mr. Gibson is the Executive Officer of the San Diego Water Board. . Prior to be selected by the Water Board as its Executive Officer in October 2009, Mr. Gibson was the Environmental Program Manager overseeing the Water Quality Restoration and Standards Branch from 2008 to 2009. Mr. Gibson has been a member of the Shipyards Sediment Clean Up Team since 2008. From 2003 to 2008, Mr. Gibson supervised the Grants and Project Assistance Unit, the Southern Watershed Protection Unit, and the TMDL unit as a Senior Environmental Scientist. Mr. Gibson started at the Water Board in 2000 as an Environmental Scientist and worked in the municipal, construction and industrial storm water, Clean Water Act section 401 Water Quality Certification, Non Point Source, and Grants Programs from 2000 to 2003. As an Environmental Scientist, Mr. Gibson worked on 401 certifications for dredging projects in San Diego Bay and Baticuitos Lagoon and helped draft the Municipal Storm Water NPDES Permits for San Diego and Orange Counties.

Prior to joining the San Diego Water Board staff, Mr. Gibson worked at the City of San Diego as a Watershed Biologist and Entomologist and has been an active member of the California Aquatic Bioassessment Workgroup since 1994. Mr. Gibson is a member of the North American Benthological Society. In 1998, Mr. Gibson founded the San Diego Stream Team and served as its Coordinator until 2000. Between 1998 and 2008, Mr. Gibson trained over 400 students, state and local agency staff, Tribal members, and interested members of the public in benthic bioassessment and monitoring. Mr. Gibson graduated from San Diego State University in 1989 with a degree in Biology.

- **David T. Barker, P.E. – Branch Chief, Surface Water Basins Branch Supervising Water Resource Control Engineer**

Mr. Barker has approximately 35 years of professional work experience at the San Diego Water Board, and has been a Supervising Water Resource Control Engineer since 2000. Prior to 2000, Mr. Barker served as a Senior Water Resource Control Engineer from 1981 through 2000, an Associate Water Resource Control Engineer from 1979 through 1981 and a Water Resource Control Engineer from 1976 through 1978. Between 1985 and 2005, Mr. Barker served as the technical staff lead for all nine of the San Diego Water Board's cleanup and abatement orders addressing marine sediment. He has also been involved in at least four other sediment remediation projects which may lead to the issuance of cleanup and abatement orders in the future. While Chief of the Water Quality Standards Unit, Mr. Barker authored a number of amendments to the Water Quality Control Plan for the San Diego Bay Region (Basin Plan), part of which included the development of a cleanup policy that was later used by the State Water Board as one of the bases for its Resolution No. 92-49; "Policies and Procedures for Investigating and Cleanup and Abatement of Discharges under Water Code section 13304."



Since 2008, Mr. Barker has had responsibility for managerial oversight of the 401 Water Quality Certification Program, and worked on approximately 12 sediment dredging projects. Prior to 2008, Mr. Barker worked preparing regulatory documents, including WDRs, and on other compliance issues for approximately two dozen dredging projects. He has had supervisory or managerial job responsibilities under various San Diego Water Board regulatory programs involving groundwater and/or surface water cleanups at several hundred sites in the San Diego Bay Region.

Mr. Barker obtained a Bachelor of Science Degree in Civil Engineering from Virginia Tech University in 1975, and has been a California Registered Civil Engineer since 1978. He also completed graduate level Civil Engineering classes in wastewater and water treatment plant design, water and wastewater chemistry, and airport design at San Diego State University between 1977 and 1978. He has completed training classes offered by the State Water Board on environmental remediation and its Sediment Quality Objectives Policy, and lectured at local universities about San Diego Water Board-ordered cleanups and related policies such as Resolution No. 92-49 between 1981 and 2000.

- **Julie Chan, P.G. – Branch Chief, Cleanup and Land Discharge Branch  
Supervising Engineering Geologist**

Ms. Chan has approximately 11 years of professional work experience at the San Diego Water Board, and has been the Branch Chief of the Cleanup and Land Discharge Branch of the San Diego Water Board for approximately three and one half years. She began as a Senior Engineering Geologist for the San Diego Water Board in 2000, and also worked as a Senior Engineering Geologist for the State Water Board from 1995 to 2000.

During her tenure at the San Diego Water Board, Ms. Chan has worked on five sediment remediation projects in San Diego Bay, including Tow Basin, NTC Boat Channel, Convair Lagoon, TDY and Mouth of Chollas Creek. She has worked on over fifty groundwater cleanups. At the State Board, Ms. Chan worked on writing the implementation plan and its EIR for the Bay-Delta Water Quality Control Plan, designed to restore the ecological health of the Bay Delta by implementing flow and salinity standards. Prior to that, Ms. Chan worked for five years at the U.S. Geological Survey helping create a model salinity fate and transport model for tile-drained areas of the west side of the San Joaquin Valley in response to the Kesterson Reservoir bird deaths, deformities and reproductive failures, and published a peer-reviewed paper relating to her work.

Ms. Chan obtained a Bachelor of Sciences Degree in Geology from the University of Wisconsin, Milwaukee, and a Master of Sciences Degree in Geology from Washington State University. She has completed a variety of trainings offered by the State Water Board, including Sediment Quality Analysis for SQOs, Invalidating Data – What It Means and What to Do, Assessment and Management of Sites with MTBE, Evaluation of Groundwater Models and Soil and Gas Survey Seminar. She has attended a number of continuing education seminars on environmental cleanups.

- **Christian Carrigan, Senior Staff Counsel**

Mr. Carrigan is Senior Staff Counsel at the State Water Resources Control Board's Office of Enforcement. He is specially assigned to the San Diego Water Board's Cleanup Team for the Shipyard Sediment Site TCAO matter. Prior to becoming Senior Staff Counsel, Mr. Carrigan was a partner at the law firm of Miller, Starr & Regalia, and a principal at the law firm of Morgan, Miller, Blair. He has administrative advocacy and trial experience under the Porter-Cologne Water Quality Control Act, the Clean Water Act, CERCLA, the California Environmental Quality Act and a variety of other state and federal environmental statutes. Mr. Carrigan is admitted to practice law in all of the Courts of California, the United States Supreme Court, the Federal Court of Claims, the Ninth Circuit Court of Appeals, and all of the federal District Courts of California.

- **Craig Carlisle, P.G./C.E.G – Unit Chief, Central Cleanup Unit  
Senior Engineering Geologist**

Mr. Carlisle has over 11 years of professional work experience at the San Diego Water Board, and has been a Senior Engineering Geologist for the San Diego Water Board for approximately nine years. He began as an Associate Engineering Geologist for the San Diego Water Board in 2000, and also worked as a Project Manager for environmental consulting firms from 1986 to 2000.

During his tenure at the San Diego Water Board, Mr. Carlisle has worked on several sediment investigation and remediation projects in San Diego Bay including Convair Lagoon, Campbell Shipyard, Mouth of Chollas Creek TMDL, and several other TMDLs, including Naval Station San Diego, Downtown Anchorage, and the Navy Submarine Base. He has also worked on over 100 groundwater remediation projects, both as a regulator and as a consultant, including large DOD Installation and Restoration projects.

Mr. Carlisle obtained a Bachelor Degree in Economics and Master Degree in Geological Sciences from the University of California at Santa Barbara, and a Master of Business of Administration from California State University, San Marcos. He served as an instructor on underground storage tank regulations and a presenter at San Diego County Environmental Health forums on site mitigation and assessment. He also was a member of the team that authored the earliest version of San Diego County's Site Assessment and Mitigation Manual (SAM Manual) that has been recognized as the standard of practice for environmental work in California. Mr. Carlisle has completed a variety of trainings and attended seminars on topics including PCB analysis and data interpretation, CEQA, 401 Certification, land disposal regulations, TMDLs, and CERCLA RI/FS.

- **Eric Becker, P.E. – Unit Chief, Southern Watershed Unit  
Senior Water Resource Control Engineer**

Mr. Becker has 20 years of professional work experience at the San Diego and Central Valley Water Boards. He transferred to the San Diego Water Board in 2001 and has been the Unit Chief of the Southern Watershed Unit since 2008.

During his tenure at the Central Valley Water Board, Mr. Becker work on PCB remediation projects at large DOD Installation and Restoration and Southern California Edison sites. He also worked on over 50 soil and groundwater remediation as part of the Spills Leaks Investigation and Cleanup Program. At the San Diego Water Board, Mr. Becker has supervised the issuance of over 40 Clean Water Act Section 401 Water Quality Certifications. This includes the recent BAE Systems Dry Dock Maintenance Dredge Project that involved the dredging of sediment within the Shipyard Sediment Site.

Mr. Becker obtained a Bachelor of Sciences in Civil Engineering from San Diego State University in 1992. He has completed a variety of trainings and seminars on groundwater pollution and hydrology, CEQA, PCB cleanups, and Clean Water Act Section 401 Water Quality Certifications. He has been a Professional Engineer in Civil Engineering since 2003.

- **Tom Alo  
Water Resource Control Engineer**

Mr. Alo has been a Water Resource Control Engineer at the San Diego Water Board since 2000. During that time, in addition to the Shipyard Sediment Site TCAO, Mr. Alo has worked on the Campbell Shipyard, NTC Boat Channel, Tow Basin and Convair Lagoon marine sediment cleanups and the mouth of Paleta Creek TMDL and Convair Lagoon matters, each of which addressed contaminated marine sediments. He has also worked on the TDY, Goodrich, Solar Turbines and BAE Systems San Marcos cleanups.

For approximately seven years prior to joining the San Diego Water Board, Mr. Alo worked at A.L. Burke Engineers, Woodward-Clyde Consultants, IT Corporation, and Dames & Moore as a staff engineer, where he conducted soil and groundwater investigations and helped with the design and implementation of site remediation plans at approximately half dozen sites.

Mr. Alo obtained a Bachelor of Sciences Degree in Civil Engineering from Cal Poly Pomona in 1993. He has received training from the State Water Board, Army Corps of Engineers, and others on Collection, Analysis, and Interpretation of Sediment Quality Data; Analysis and Development of Sediment Quality Guidelines; Understanding Contaminated Harbor and River Sediment; Analysis and Interpretation; Dredged Material Assessment and Management; Environmental Stability of Chemicals in Sediments; and Sediment Quality Analysis.

- **Chad Loflen –  
Environmental Scientist**

Mr. Loflen has over 3 years of professional work experience at the San Diego Water Board. Mr. Loflen has worked on over 100 Clean Water Act section 401 Certification applications, at least 10 of which involved dredging sediments. Prior to that he was a Student Intern at the San Diego Water Board.

Mr. Loflen was awarded a Bachelor of Sciences Degree in Biology (Marine Emphasis), Magna Cum Laude, and a Master of Science Degree in Biology, both from San Diego State University. He worked as a Research Assistant and Scientific SCUBA Diver on a variety of marine research projects in San Diego Bay and offshore Southern California with TENERA Environmental and San Diego State University, including fish surveys, fish impingement and entrainment studies, lobster habitat use and eel grass surveys, invasive bivalve studies, and benthic suction sampling and species identification.

- **Vicente Rodriguez –  
Water Resource Control Engineer**

Mr. Rodriguez has 18 years of professional work experience at the San Diego Water Board. He previously worked on one marine sediment remediation project in San Diego Bay and a few dozen groundwater cleanup projects. He received his Bachelor of Science in Civil Engineering from Prairie View A&M University.

## **APPENDIX B**

All comments listed in “ID” numerical order

Appendix B contains the individual comments in order of the Comment ID numbers assigned by the Cleanup Team. The original comment letters and rebuttal comment letters can be found on the San Diego Water Board website here:

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/shipyards\\_sediment/2005\\_0126adt.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/shipyards_sediment/2005_0126adt.shtml) .

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**Comment ID: 1**

**Organization: Campbell Industries**

**DTR Section: 6.3.1**

**Comment:**

San Diego Marine Construction Company (subsequently Star & Crescent) did not sell its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972.

In Finding 6 of the Draft Technical Report, in the first sentence of the second paragraph of Section 6.3.1, it states, “San Diego Marine Construction Company (subsequently Star & Crescent) sold its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972.” This statement is incorrect. San Diego Marine Construction Company (subsequently Star & Crescent) sold the business and assets of its Marine Division to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972. The minutes of the first meeting of Directors of MCCSD approving that transaction are attached for inclusion in the administrative record. The purchase did not include the leasehold. San Diego Marine Construction Company surrendered its leasehold to the San Diego Unified Port District (SAR 163149), and the Port District entered into a new lease with MCCSD (SAR 174131).

**Comment ID: 2**

**Organization: U.S. Navy**

**DTR Section: 10**

**Comment:**

Ten IRP sites were identified in the CAO; nine of these sites were also identified in the Complaint. The potential for historical releases from four of the sites (IRP Sites 8, 9, 10, and 12) to San Diego Bay is low, and it is unlikely that these sites ever had a detectable impact on bay sediments. Historical transport pathways from six of the sites (IRP Sites 1, 2, 3, 4, 7, and 13) did exist or may have existed, although there is little direct evidence in bay sediments that is indicative of releases from these sites. Discharges to the bay from these sites would have declined over time due to cessation of site activities, improved environmental practices, and completion of remedial actions. Five of the sites (IRP Sites 7, 8, 9, 12, and 13) have been closed with no further action, with regulatory agency concurrence.

**Comment ID: 3**

**Organization: Campbell Industries**

**DTR Section: 6.3.1**

**Comment:**

Refusal or failure to respond to State Water Board inquiries is not a basis for naming Campbell Industries as a Discharger.

In Finding 6 of the Draft Technical Report, in the third paragraph of Section 6.3.1, it states, “The stock of Campbell Industries was acquired by Marco Holdings, Inc. (“MARCO”), a Washington corporation, in 1979. Marco Holdings, Inc. is a wholly-owned subsidiary of Marine Construction and Design Company, a Washington Corporation.” In the subsequent paragraph in Section 6.3.1 of Finding 6 in the DTR, it states:

On February 19, 2004 the San Diego Water Board issued Investigative Order R9-2004-0026 directing MARCO to submit a historical site assessment report that completely documented all leasehold information and activities in the vicinity of the BAE Systems leasehold that may have affected water quality, including chemical and waste handling and storage activities, discharges, and monitoring data.

That statement is incorrect. MARCO is defined in the preceding paragraph as Marco Holding, Inc. That company is not mentioned in Investigative Order R9-2004-0026 (SAR 193136). The subsequent paragraph in Section 6.3.1 of Finding 6 in the DTR recites the contents of a letter from H. Allen Fernstrom on behalf of MARCO, now defined as Marine Construction and Design Co. The letter first states that Marine Construction and Design Co. had conducted an internal search and had no records of any operations of its or Campbell Industries operations within the Southwest Marine leasehold. There is no evidence that statement was inaccurate at the time it was written in 2004. Marine Construction and Design Co. has never operated at the Southwest Marine leasehold. Even today Campbell Industries has not located any records of the operations of its subsidiary at the Southwest Marine leasehold. The letter then states that Marine Construction and Design Co. has no California operations or offices. That statement was true then and remains accurate today. It then states that Campbell Industries terminated all California operations in 1999 at Eight Avenue and Harbor Drive (the former Campbell Shipyard), and all available records from California-based operations pertain to that Campbell Shipyard. That statement is also correct. After reciting the contents of this letter, the paragraph ends with the statement, “MARCO was not responsive to the directives of the San Diego Water Board’s Investigative Order and their lack of responsiveness forms part of the basis for the San Diego Water Board’s determination that MARCO should be named as a discharger in the Cleanup and Abatement Order.” This statement is erroneous in four respects. First, MARCO defined as Marco Holdings, Inc. was not under any directive from the San Diego Water Board, as discussed above. Second, MARCO if defined as Marine Construction and Design Co. truthfully responded to the Investigative Order based on the information available to it at the time. Third, Campbell Industries has been an active participant in the mediation proceedings with Timothy Gallagher which led to the drafting of the pending TACO and DTR, and voluntarily provided most of the evidence of its history at the Site recited in Section 6.3.1. It has not refused or failed to respond to any inquiry by the San Diego Water Board. Finally, the TCAO and DTR do not name MARCO (however defined) as a Discharger in the Cleanup and Abatement Order. Paragraphs 4 and 5 in Section 6.3.1 should be deleted. Not only are portions of these paragraphs inaccurate, but there is no basis or need for the San Diego Water Board to use refusal or failure to respond as a factor in naming Campbell Industries as a Discharger in the Cleanup and Abatement Order.

**Comment ID:** 4  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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Multiple dredging events from the 1940s through 2003 have removed sediments that accumulated in three areas of San Diego Bay adjacent to the IRP sites and in the main navigational channel between NBSD and the Shipyard Sediment Site, reducing the likelihood of potential impacts of any historical releases from IRP sites as well as the availability of COCs for potential resuspension and transport.

**Comment ID:** 5  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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At NBSD, COC concentrations in surface sediment in the three areas adjacent to the IRP sites tend to be higher closer to shore and lower outside the pier heads and in the main channel. At the Shipyard Sediment Site, COC concentrations in surface sediment also decrease with increasing distance from the shoreline. These concentration gradient patterns are consistent with the presence of separate, localized source areas at NBSD and the Shipyard Sediment Site and are not consistent with the transport of COCs from NBSD to the Shipyard Sediment Site. There are no reasonable physical or chemical mechanisms that can scientifically explain these chemical gradient patterns other than the existence of localized source areas at each site.

**Comment ID:** 6  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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Average COC concentrations in the three areas of San Diego Bay adjacent to the IRP sites are lower than average concentrations within the proposed remediation footprint at the Shipyard Sediment Site. In addition, COC concentrations in subsurface sediments adjacent to the IRP sites do not appear to be substantially higher than those in surface sediments. Based on the existing data reviewed for the site, there are no reasonable physical or chemical mechanisms that can scientifically explain higher chemical concentrations at a distant site that exceed the original source concentration.

**Comment ID:** 7  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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Because of its prevalent use as an antifouling coating on commercial ships and its lack of use on Navy ships, TBT is a strong, site-specific indicator of Shipyard Sediment Site releases. TBT concentrations in sediments adjacent to NBSD are about an order of magnitude lower than concentrations found at the Shipyard Sediment Site. Other Shipyard Sediment Site COCs, including arsenic, cadmium, copper, lead, zinc, and PCBs, are significantly correlated with TBT in sediments at the Shipyard Sediment Site. This correlation is consistent with co-occurring sources within the Shipyard Sediment Site and inconsistent with a significant source from NBSD.



**Comment ID:** 8  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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PCB fingerprinting of sediments at the Shipyard Sediment Site is consistent with the presence of two distinct, localized sources of PCBs. If these PCBs were derived from activities at NBSD, the signatures would be similar. The spatial distribution of PCBs at the Shipyard Sediment Site is consistent with the presence of two different sources, with concentrations found at the north end of the site higher than those at the south end.

**Comment ID:** 9  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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A modeling simulation was performed specifically to evaluate the claim that sediments adjacent to IRP sites may have been resuspended by propeller wash, transported to the Shipyard Sediment Site by tidal currents, and redeposited within the Shipyard Sediment Site. The modeling results indicate that net deposition to the Shipyard Sediment Site proposed remediation footprint due to resuspension and transport from areas adjacent to IRP sites at NBSD was between 0.17 percent and 0.37 percent of the total annual deposition, an amount that is negligible in the overall deposition of sediments at the Shipyard Sediment Site.

**Comment ID:** 10  
**DTR Section:** 10

**Organization:** U.S. Navy

**Comment:**

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Collectively, these lines of evidence indicate that the overall contribution of Installation Restoration Program (IRP) sites to contamination at the Shipyard Sediment Site is negligible.

**Comment ID:** 11  
**DTR Section:** 4.3.1.

**Organization:** City of San Diego

**Comment:**

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COMMENT 1.0: STUDIES CITED IN DTR SECTION 4.3.1 DO NOT SUPPORT THE DTR'S STATEMENTS REGARDING CHOLLAS CREEK'S INFLUENCE ON THE CHEMICALS OF CONCERN IN SHIPYARD SEDIMENTS.

The Draft Technical Report for Tentative Cleanup and Abatement, Order No. R9-2011-0001 is herein referred to as the "DTR." The DTR quotes the following allegation by the San Diego Regional Board in Cleanup and Abatement Order, Finding 4:

"the City of San Diego has discharged urban water containing waste through its MS4 to Chollas Creek resulting in the exceedances of chronic and acute California Toxics Rule copper, lead, and zinc criteria for the protection of aquatic life. Studies indicate that during storm events, storm water plumes toxic to marine life emanate from Chollas Creek up to 1.2 kilometers into San Diego Bay, and contribute to pollutant levels at the Shipyard Sediment Site." (Section 4, page 4-1.)

The DTR further states this allegation is based on:

"Available studies (Schiff, 2003, Katz et al., 2003; Chadwick et al., 1999) indicate that storm water plumes emanating from Chollas Creek outflow to San Diego Bay are toxic to marine life and introduce suspended solids, copper, zinc, and lead to the Shipyard Sediment Site through settling of particles." (Section 4.3.1, page 4-3.)

The available studies referred to above are:

Schiff, K., S. Bay and D. Diehl, 2003. Stormwater Toxicity in Chollas Creek and San Diego Bay, California. Environmental Monitoring and Assessment 81: 119-132, 2003. 2003 Kluwer Academic Publishers. Printed in the Netherlands. (Herein referred to as Schiff 2003).

Katz, C.N., A. Carlson-Blake, and D.S. Chadwick 2003. Not found 1.

Chadwick B., J. Leather, K. Richter, S. Apitz, D. Lapota, D. Duckworth, C. Katz, V. Kirtay, B. Davidson, A. Patterson, P. Wang, S. Curtis, G. Key, S. Steinert, G. Rosen, M. Caballero, J. Groves, G. Koon, A. Valkirs, K. Meyers-Schulte, M. Stallard, S. Clawson, R. Streib Montee, D. Sutton, L. Skinner, J. Germano, and R. Cheng. 1999. Sediment Quality Characterization - Naval Station San Diego Final Summary Report. U.S. Navy Technical Report 1777. (Herein Referred to as Chadwick 1999).

The studies cited by the DTR at Section 4.3.1, page 4-3, provide insufficient support for the allegations in the DTR, because they lack information that would allow a detailed peer review, thus preventing reproduction of the results, verification of all data and methods, and testing of hypotheses. Scientists are generally known to have natural human biases that can influence their perceptions. While these biases are not always conscious and certainly not intentional, they are widely recognized to exist. To overcome these biases, certain principles generally known as the scientific method have evolved in an attempt to be as objective as possible. The scientific method's approaches for overcoming natural biases include:

1. Adopting a practice of full disclosure by documenting, archiving, and sharing all data and methodology so they are available for careful scrutiny by other scientists giving them the opportunity to verify the results, and most importantly, reproduce them.
2. Proposing hypotheses and testing these hypotheses through experimental studies using methods that are repeatable. Through this testing of hypotheses, scientific theories can be developed when independently derived hypotheses come together in a coherent and supportive structure.

The documents referenced above by the DTR do not appear to achieve these goals. The data are not included in the reports, which prevents an independent scientific review of the information. The lack of data availability and independent review of such information, and its use in the DTR to assign responsibility to parties is particularly problematic since two of the three documents are

authored by employees or contractors of the U.S. Navy, and one of the documents cited is published by the U.S. Navy, a party named as responsible for discharges to the site.

Specifically, an independent review of this information should include access to the following information:

a. Schiff (2003): although this document indicates that methodological details are provided in another document (Schiff et al. 2001. Stormwater Toxicity in Chollas Creek and San Diego Bay. Technical Report 340. Southern Coastal Water Research Project), our review of this document and that referenced did not identify the following:

i. While the papers note a digital global positioning system (GPS) was used to record the sampling locations, no table reports location data, and the one figure that is provided is so small and has such limited features, the locations are not legible or precise enough to be replicated.

ii. While Schiff (2001) provides a summary of the toxicity tests, these data only provide statistical measures of means and standard deviations. The raw data is not provided. Significant data are collected concurrent with the bioassay tests. These include test chamber salinity and temperature. Notes to the toxicity test results indicate there were issues with some test chambers, but are not specific and without the data, do not allow for third party review.

b. There is no raw data for the analytical chemistry, specifically the output of the laboratory instrumentation. EPA Contract Laboratory Program (CLP) procedures require analytical results be run and reported with performance duplicates and lab blanks allowing scientists to assess the influence of potential contamination from labs, and the performance of lab equipment, which has repeatedly been demonstrated to be highly variable. CLP procedures were developed to allow verification of procedures, duplication of results and are the industry standard for documenting environmental sample analysis. Without the raw data or laboratory quality control results, it is not possible to evaluate the degree to which chemical analytical data has been appropriately validated, and the accuracy and precision of the results.

c. Chadwick (1999)

i. Chadwick et al. (1999) estimate total annual mass loads and percent contributions historically from different sources, including Chollas Creek, on page 95, sections 6.2 and Tables 29 and 30. The means of estimating historical storm water inputs are not presented. How the volumetric discharges are estimated is not presented. Since these methods are not provided, we cannot independently verify their accuracy, thus preventing the report from independent peer review.

ii. On page 95, section 6.2, and Tables 29 and 30, the report does not provide measures of statistical error. Thus, the uncertainty associated with the provided estimates cannot be evaluated.

d. Katz (2003).

i. The document has a blank cover page with the handwritten notation of "Conference 2003, April 8, 2003, and Katz et al. 2003). But the following page, which is a copy of the actual poster, has no date or indication of where it was presented or published. We are unable to verify that Katz (2003) even exists. Searches of Agricola, Google Scholar, and other databases which list such documents do not result in any findings that such a presentation was made. A poster of the same title is referenced among publications by the U.S. Navy in a now deleted web page (available through Google's cached document archive). Given the citation is incorrect and unavailable, it further demonstrates our concern that this information has not received independent scientific review.

ii. The ability to evaluate this reference is limited because of the abbreviated discussion of the overall study in this format

**Comment ID:** 12

**Organization:** Port District

**DTR Section:** 1.4.2.1. and 1.5.2.

**Comment:**

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Port Support of the Proposed Remedial Footprint

TCAO Finding 33 and Attachment 2

DTR §§1.2; 1.4.2.1, and 1.5.2

Additionally, the Port's experts agree that the remedial footprint can go forward without delay. While some parties may claim that the remediation cannot go forward unless the Chollas Creek outfall area is included within the remedial footprint or otherwise addressed because of recontamination concerns, the Port's designated fate and transport expert has concluded that any interim resedimentation from Chollas Creek discharges will not adversely impact the remediation efforts at the Shipyards. (Exhibit "2" [Port Expert Designation]; Exhibit "4" [Dr.Poon Declaration], paragraphs [13-15.]) As such, the Port supports the exclusion of the mouth of Chollas Creek from the remedial footprint as well as the decision to move forward expeditiously with the remediation.

**Comment ID:** 13

**Organization:** Port District

**DTR Section:** 1.4.2.1. and 1.5.2.

**Comment:**

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Port Support During the TCAO/DTR Process

The Port also reiterates its willingness to provide appropriate support to the Regional Board in its efforts to implement the TCAO and DTR. The Port was instrumental in coordinating initial efforts to get the dischargers and interested parties into discussions and mediation to try to reach a consensus on remedial approach and scope. The Port has worked to locate and leverage dischargers' potentially applicable insurance policies that could assist in funding the remediation. The Port also made its experts available to the CUT to assist in the site assessment.

The Port remains committed to supporting the Regional Board in any appropriate manner afforded by law. The Port will continue to be engaged in any appropriate mediation process, to reach a resolution of any remediation and monitoring issues. Likewise, the Port is working with the CUT and supporting its efforts through the California Environmental Quality Act (CEQA) process. The Port is further working with the CUT to explore options for potential disposal or dewatering sites for the dredged sediment.

**Comment ID:** 14

**Organization:** City of San Diego

**DTR Section:** 4.7.1.3.

**Comment:**

COMMENT 1.1: PURPLE SEA URCHIN FERTILIZATION TESTS (SCHIFF 2003) CITED AT DTR SECTION 4.7.1.3 DO NOT SUPPORT THE CONCLUSION THAT CHOLLAS CREEK HAS CONTRIBUTED TOXIC EFFECTS OR CONSTITUENTS OF CONCERN TO THE SITE SEDIMENTS.

DTR Section 4.7.1.3 (page 4-14) reaches the conclusion that Chollas Creek releases a toxic plume impacting sediments at the Site based on purple sea urchin fertilization tests provided in Schiff (2003). Schiff (2003) (which references Schiff (2001) for detailed methods) notes as follows:

"This study observed that stormwater plumes emanating from Chollas Creek extended between 0.02 and 2.25 square kilometers over San Diego Bay during small to moderately-sized storm events. Plumes were easily distinguished using salinity as a conservative tracer of wet weather inputs. Turbidity was also a good tracer of the plume. Storm water plumes formed relatively thin lenses of 1 to 3 m, floating on top of the more dense bay water." (Emphasis added.)

Thus, the toxicity reported by Schiff (2003) is based on the surface water plume of less than 3 meters that floats above the lower water column and bottom sediments. No evidence or data is provided to demonstrate the chemicals or solids responsible for the observed toxicity in the surface are transported to the deeper portions of the water column and the bottom sediments. In fact, the data collected to evaluate sediment toxicity during the Shipyard Site remedial investigation indicate the toxicity observed at the surface water interface during storm events does not occur in waters and sediments near the bottom of the Site. Of note:

1. Purple Sea Urchin fertilization in waters associated with the bottom sediments of the Site was over 87% in all samples (See Table 18-8, page 18-16 in DTR Volume 2). This is a level significantly above that seen in Schiff (2003), and comparable to the reference samples. This contradicts the DTR's assertions that Chollas Creek is contributing toxic levels of any substance to the Site.

2. Toxicity tests including the urchin fertilization test have been conducted on the Site's sediments and there was no correlation between the chemical concentrations of copper, zinc, or lead, which are the primary constituents found in Chollas Creek waters, and the toxic effects measured.

**Comment ID:** 15

**Organization:** Port District

**DTR Section:** 1.4.2.1. and 1.5.2.

**Comment:**

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Past and Present Port Support and Cooperation with the Regional Board

The Port is dedicated to protecting and improving the environmental conditions of San Diego Bay and the Port tidelands. The Board of Port Commissioners is committed to conducting Port operations and managing resources in an environmentally sensitive and responsible manner and ensuring that tenant operations do the same.

The Port was created by the State Legislature in 1962 to manage San Diego Bay and surrounding tidelands by balancing economic benefits, community services, environmental stewardship, and public safety. (California Harbors and Navigation Code, App. 1 [the Port Act].) The Port takes seriously its authority and responsibility to protect, preserve, and enhance San Diego Bay's physical access; natural resources, including plant and animal life; and water quality. (Port Act, §4(b).)

The Port has adopted as its mission statement the commitment to protecting the tideland resources through balancing economic benefits, community services, environmental stewardship, and public safety on behalf of the citizens of California. To this end, the Port has developed strategic goals to protect and improve the environmental conditions of San Diego Bay and surrounding tidelands. The Port currently has several programs in place to protect stormwater, reduce pollutant sources, improve air quality, and reduce air emissions. For example, the Port has established an environmental committee with the goal of promoting environmental improvement projects throughout the San Diego Bay beyond ordinary compliance obligations. (Exhibit " 1 " [Gibson Deposition], 56:12-57:14.) Such Port programs have positively impacted water quality in bays and harbors throughout the state.

To the extent the CUT would designate the Port as a primary discharger because of perceived non-cooperation grounded in the Port's withdrawal from a voluntary mediation process that it suggested, such a position would be an inappropriate basis for Port primary liability as a matter of law. On the contrary, the Port's commitment to the above principles is reflected its long history of cooperating with the Regional Board in efforts to remediate sites at which the Port is a landlord, some of which are listed below.

#### 1. Campbell Shipyard

The Port provided significant assistance and leadership at another large San Diego Bay dredging project, the Campbell Shipyard site. At that site, the Port worked cooperatively with and supported the Regional Board's cleanup approach. (See, Exhibit " 1 " [Gibson Deposition], 28:12-24; 48:18-49:9; Exhibit "5" [Barker Deposition], Vol. III, 539:11-25.) The Port assisted in pushing the site toward mediation and assisted in securing insurance proceeds from a number of dischargers as well as its own insurance. These funds were used to finance the dredging and

capping of the impacted sediments. Ultimately, the Port performed the sediment dredging and capping work. (Exhibit "6" [Carlisle Deposition], Vol. I, 119:2-6.)

## 2. Shelter Island Yacht Basin TMDLs

The Regional Board has been implementing copper TMDLs at the Shelter Island Yacht Basin. As David Barker acknowledged in his deposition, the Port "is working very cooperatively with the [Regional B]oard" on this matter. (Exhibit "5" [Barker Deposition], Vol. III, 543:2-8.) In particular, the Port has been working at phasing out copper-based hull paint and "taking a lead role in investigating the use of alternative vessel hull paints to curtail copper discharges into the [San Diego B]ay." (Exhibit "5" [Barker Deposition], Vol. III, 544:25-545:6.) The Port has sought grant funds to assist in the switching of hull paints and has been facilitating a discussion on this point between the Regional Board, the yacht owners and the marinas. (Exhibit "5" [Gibson Deposition], 31:20-32:15; Exhibit "5" [Barker Deposition], Vol. III, 545:7-10.) The Port has also made financial contributions to this effort. ((Exhibit " 1 " [Gibson Deposition], 32:16-23.)

## 3. Teledyne Ryan/Convair Lagoon

The Port has worked cooperatively with the Regional Board at the Teledyne Ryan (TDY) and Convair Lagoon sites. These sites involve a former aeronautical facility that had landside contamination impacts (the TDY site) and San Diego Bay sediment contamination impacts (the Convair Lagoon site). Again, the Port is working cooperatively with the Regional Board at this site. (Exhibit "5" [Barker Deposition], Vol. III, 540:11-20.) In fact, the Port assisted in bringing historic specialized insurance assets to help pay for demolition and remediation costs on the TDY site. Further, the Port worked aggressively with Regional Board oversight to remediate the sediment in the Convair Lagoon.

## 4. South Bay Power Plant

The South Bay Power Plant is a complex decommissioning and demolition project related to a power plant facility. There are related environmental issues associated with this work, including issues relating to San Diego Bay sediment. The Port has been cooperative while working with the Regional Board at the South Bay Power Plant site. (Exhibit " 1 " [Gibson Deposition], 30:18-31:8.) The Port is also working with other responsible agencies and parties through a very complex process to implement the demolition and related processes.

## 5. Former BFGoodrich South Campus

BFGoodrich is a site involving investigation and remediation in an area adjacent to the San Diego Bay. The Port is working with the Regional Board in investigating potential areas of historic contamination, including sediment contamination.

## 6. Tow Basin

The Tow Basin is an area adjacent to the San Diego Bay involving PCB contamination associated with a former aeronautics facility. The Port has been working cooperatively with the Regional Board to conduct the necessary investigation and remedial work pursuant to the Sediment Quality Objectives.

**Comment ID:** 16

**Organization:** City of San Diego

**DTR Section:** 4.7.1.3.

**Comment:**

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COMMENT 1.2: THE DTR'S RELIANCE ON SCHIFF (2003) IS MISPLACED, AS THE SCHIFF (2003) PLUME STUDIES ARE NOT SUPPORTED BY ADEQUATE DATA. DO NOT TAKE INTO ACCOUNT THE HYDRODYNAMIC PROCESSES THAT AFFECT THE FATE AND TRANSPORT OF SEDIMENTS FROM CHOLLAS CREEK INTO SAN DEGO BAY, AND THEREFORE OVERSTATE TOXICITY IN THE CHOLLAS FRESHWATER PLUME.

Section 4.7.1.3 of the DTR (page 4-14) relies on Schiff (2003) in support of its conclusions regarding toxicity in the Chollas Creek freshwater plume. Much of the site and observed toxicity is along the shoreline which has significant structural obstructions making this area quiescent with a low likelihood of exposure to the freshwater plumes from Chollas Creek. The Schiff (2003) plume maps (figures 2 through 8 ) which show temperature, salinity, turbidity (beam attenuation), and toxicity results right up to the shore are likely not based directly on any data collected from these areas (again it is impossible to review since locations are not provided). Nowhere in the text is there mention of the authors having received access to these restricted areas to perform the sampling. We believe the results showing the area of impacts on these figures are extrapolations based on Kriging the extent of the plume. This geostatistical method referred to as Kriging does not take into account advection, dispersion, or transformation. Where hard boundaries exist such as shorelines, Kriging will extrapolate right up to the boundary. However, in theory, advection to a hard boundary is very limited and movement toward a hard boundary tends to be via diffusion, which is a very slow process compared to advection. Schiff (2003) does not provide data indicating the Chollas freshwater plume extends up to the shoreline. The use of Kriging or other geostatistical methods to predict concentrations beyond the boundaries of sampling is an inappropriate use of the geostatistical method. Geostatistical tools are developed for characterizing data within the sampled area. Such tools have no predictive abilities, and thus should not have been used to determine the area influenced by the surface waters of Chollas Creek.

**Comment ID:** 17

**Organization:** City of San Diego

**DTR Section:** 4.7.1.3.

**Comment:**

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COMMENT 1.3: THE HYDRODYNAMIC MODEL REPORTED IN CHADWICK (1999) LACKS IMPORTANT INFORMATION INFLUENCING FATE AND TRANSPORT AND THEREFORE MAY BE OVERSTATING IMPACTS FROM CHOLLAS CREEK.



Section 4.7.1.3 of the DTR relies on Chadwick (1999) as indicating that "the Chollas Creek outflow (plume) to San Diego Bay can introduce pollutants to the Shipyard Sediment Site." Yet the hydrodynamic model presented by Chadwick (1999) is deficient such that it provides insufficient support for the DTR's conclusion about the reach of the Chollas Creek plume. Specifically, this model does not appear to take into account physical obstructions to flow such as ships docked at NASSCO piers 3-6 at the mouth of Chollas Creek, which is a typical situation. Such ships almost (or sometimes do) touch bottom at that location, which creates a physical impediment to flow from Chollas Creek to the Shipyard. The Doppler meters used to calibrate the hydrodynamic model were most likely placed outside of piers and probably could not show the effects of the piers on waters between them. Again, the locations of the Doppler meters are not provided in the report and so it is impossible to review this data. Also this model uses a 100 meter grid which cannot be used to conclude movements of sediments at the scale of Chollas Mouth which is less than 100 m wide. Collectively these issues with the hydrodynamic modeling efforts in the shoreline area indicate model predicted results for this area should not be relied upon for predicting fate and transport from the Chollas Creek mouth area or from the Shipping Channel up toward the shoreline and are likely over-predicting the movement of sediments to the shoreline.

In Chadwick (1999), Section 6.4.2, page 119 describes methods for modeling the creek discharges during storms using a half sine wave function. While the use of a half sine wave may fit the mathematical functions of the tidal model used, it does not match the creek discharges, creek hydrology, or storm functions in the region. Creek discharges from a storm may be significantly longer than one-half tidal cycles and will have several local maxima due to differing rainfall intensities during the storm. This suggests that loading estimates, transport direction and distance of transport could be inaccurately predicted for time steps relevant to tidal cycles from the tidal model used.

Direct data or a well calibrated model that includes all physical influences should be used to make such conclusions. Without either, and direct data being preferred over a mathematical model, it is not reasonable to conclude that Chollas Creek has introduced toxicity and pollutants to the Shipyards Site, which is largely along the shoreline where physical obstructions occur.

**Comment ID:** 18

**Organization:** City of San Diego

**DTR Section:** 4.7.1.3.

**Comment:**

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COMMENT 1.4: MEASURED CHOLLAS CREEK DISCHARGE DATA AS REFERENCED IN KATZ (2003) ARE INSUFFICIENT FOR DRAWING CONCLUSIONS THAT CHOLLAS DISCHARGES HAVE SIGNIFICANTLY IMPACTED SHIPYARD SEDIMENTS.

According to the DTR's description of the Katz (2003) study (DTR Section 4.7.1.3, page 4-15), the data in Katz (2003) included only one precipitation event over three days and data generated using different collection methods for different areas (Because the Katz (2003) study cannot be located, the City relies on the DTR's description of its contents). The data were extrapolated to derive conclusions as to the proportion of total impacts caused by Chollas Creek stormwater discharge versus stormwater water discharge from NAVSTA. Upstream Chollas Creek

stormwater samples were collected by the City of San Diego's contractor from two different tributaries on a flowweighted basis and then composited into one sample. Stormwater samples from NAVSTA outfalls adjacent to the channel were collected on a time-proportional basis and composited into one sample. Flow weighted sampling provides a sample whose concentration represents the event mean concentration. Time proportional sampling does not, unless the flow rate is constant over the period of sampling. Storm flows are not constant. Therefore, the two sampling methodologies are not comparable and conclusions as to the difference (or lack thereon) in concentrations or mass loadings should not be made using this data.

**Comment ID:** 19

**Organization:** City of San Diego

**DTR Section:** 4.7.1.3.

**Comment:**

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COMMENT 1.5: PURPLE SEA URCHIN TOXICITY DATA IN SCHIFF (2001 AND 2003) DO NOT PROVIDE ADEQUATE SUPPORT FOR THE CONCLUSION THAT CHOLLAS CREEK WATER CONTAINS TOXIC LEVELS OF ZINC AND COPPER.

Section 4.7 .1.3 of the DTR (page 4-15, top bulleted paragraph) relies on Schiff (2003) and the Southern California Coastal Research Project (2001) (hereafter, "Schiff (2001),") studies as support for the conclusion that "in-channel and plume toxicity was primarily due to trace metals including zinc and copper."

However, data quality issues related to copper and zinc toxicity as presented by Schiff (2003) weaken the conclusion drawn that the concentrations of each metal were high enough in the tested samples to account for the observed toxicity. Toxicity test results for the purple sea urchin (*Strongylocentrotus purpuratus*) as reported by Schiff (2001) are interpreted in part on the basis of the calculation of a toxicity unit (TU). The TU is inversely proportional to the median effective concentration (EC50, concentration producing 50% reduction in fertilization). The concentrations of metals in each sample tested were estimated based on the metal concentrations measured in undiluted samples and the estimated reduction in metals concentration based on sample dilution, where appropriate. The other measure of toxicity used in the interpretation of test results is the no observed effect concentration (NOEC). There are three observations that do not appear to support the conclusions regarding copper toxicity by Schiff (2001 and 2003):

a) The use of an EC50 concentration for copper that lies within the range of observed NOECs. Given the definition of NOEC is a concentration below which no effects are observed, it seems infeasible that an EC50 concentration would occur below a NOEC concentration for a quality data set. However, Schiff (2001) in Table 2 state their toxicity tests had a NOEC range from 20-44 ug/L and selected the EC50 of 31 ug/L. The authors do not explain why a EC50 value within the range of NOECs found was selected.

b) The failure of one of the copper reference toxicant tests based on variability in the urchin response.

A reference toxicant test is included with each batch of samples evaluated for toxicity as a quality measure to ensure that the test organisms are responding in a typical manner (i.e., that they are not organisms that are too unhealthy and susceptible to toxicity or too robust and

insensitive to toxicity). The reference toxicant test can be run with any toxicant that has a record of response at the laboratory with the specific test species. The bioassay lab used by Schiff (2001) consistently used copper as the reference toxicant. In the first reference toxicant test associated with samples collected on January 25, 2000, the reference toxicant test was inconclusive because as stated in the report: "the reference toxicant had high variability precluding the calculation of a copper EC50."

c) The observed range of EC50s from copper reference toxicant tests that did not fail were all above the EC50 chosen by Schiff (2003) and used by the OTR to demonstrate copper as having a toxic influence on the Site.

The range of copper EC50 concentrations reported in Schiff (2001) Appendix A are based on successful reference toxicant tests are: 55 ug/L (February 13, 2000), > 65 ug/L (February 22, 2000), and 40.8 I-g/L (March 7, 2000). These test results are all above the EC50 of 31 ug/L used to draw conclusion about sample toxicity in the Schiff (2001) report.

The allegation that Zinc is the primary chemical causing toxicity is suspect. The reported EC50 in Table 2, Schiff (2001) of 29 ug/L is substantially below levels set forth in the California Toxics Rule (CTR; Federal Register Vol. 65, No. 97, Thursday, May 18, 2000) as reproduced below.

#### Copper criteria in the CTR

Freshwater Acute: 120 ug/L  
Freshwater Chronic: 120 ug/L  
Saltwater Acute: 90 ug/L  
Saltwater Chronic: 81 ug/L

The chronic concentration is defined as "the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects". The urchin test is 40 minutes. The fact that 50% of the sea urchins failed to successfully fertilize at concentrations well below zinc concentrations in the CTR, would strongly suggest that something other than zinc is causing the toxic response.

Given the sea urchin test under the conditions used by Schiff (2001) where salinity was adjusted is abnormally sensitive relative to the studies identified in the CTR, the authors should at least discuss alternative hypotheses. For example, the practice of adding salts to freshwater samples to test toxicity with a saltwater species (purple sea urchin fertilization) which would not otherwise occur in such an environment is a source of uncertainty. Reference samples were not collected from an uncontaminated "riverine plume" and then diluted. Therefore the reference samples are actually not processed exactly the same as the Chollas Creek samples. Any differences resulting from different handling should be considered as plausible influences, particularly given the value of zinc toxicity published in the reports are more than four times below the chronic freshwater CTR.

**Comment ID:** 20

**Organization:** Port District

**DTR Section:** 11.2

**Comment:**

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The Port Should Not be Primarily Responsible for its Tenants' Discharges

TCAO Finding 11  
DTR §11.2

The DTR states that the Port may be named as a discharger due to its capacity as landlord of certain tenants identified as dischargers but also recognizes that "[i]n certain situations, the State Water Board has found it appropriate to consider a lessee primarily responsible and the lessor secondarily responsible for compliance with a cleanup and abatement order." (DTR, § 11.2, at p. 11 -4.) As the DTR further notes, while this determination requires an analysis of various factors, the general rule is "that a landowner or lessor party may be placed in a position of secondary liability where it did not cause or permit the activity that lead to the initial discharge into the environment and there is a primarily responsible party who is performing the cleanup." (Id) The Port agrees with the DTR's statements of the law in this regard.

While the DTR goes on to correctly note that "there is no evidence in the record that the Port District initiated or contributed to the actual discharge of waste to the Shipyard Sediment Site" it incorrectly concludes that "it is ... appropriate to name the Port District as a discharger in the CAO to the extent the Port's tenants, past and present, have insufficient financial resources to cleanup [sic] the Shipyard Sediment Site and/or fail to comply with the order." (DTR §11.2, at p. 11-4 [citing In the Matter of Petitions of Wenwest, Inc. et al., WQ 92-13, p. 9; In the Matter of Petitions of Arthur Spitzer, et al, WQ 89-8, p. 21.]

The DTR acknowledges that "[i]n the event the Port District's tenants, past and present, have sufficient financial resources to clean up the Shipyard Sediment Site and comply with the Order, then the San Diego Water Board may modify its status to secondarily responsible party in the future." (DTR §11.2, at pp. 11-4 to 11-5.) This anticipated modification is appropriate and should be implemented because there is substantial evidence of the Port District's tenants' abilities to fund the Order. In the same fashion, the evidence illustrates that the Port District's tenants are complying with the Order.

**Comment ID:** 21

**Organization:** Port District

**DTR Section:** 11.2.

**Comment:**

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The Port's Tenants Have Sufficient Assets to Conduct the Cleanup

TCAO Finding 11  
DTR §11.2

The Port's tenants have more than sufficient assets to conduct the cleanup. In fact, prior iterations of the TCAO did not name the Port as a primary discharger because of its determination that the Port's tenants had adequate assets to conduct the cleanup and were cooperating. (SAR 375780, at 375818-375819.) Inexplicably, the latest draft of the TCAO reaches a contrary conclusion

without presenting any new facts that would justify this change in position. Having acknowledged the correct legal analysis for determining whether the Port should be primarily or secondarily liable, the CUT bears an initial burden of establishing through evidence the facts necessary to conclude that the Port's tenants do not have adequate assets to fund the cleanup efforts. Yet, no such evidence has ever been presented.

In fact, the evidence establishes beyond question that the Port's tenants have adequate assets to fund the cleanup efforts. The DTR estimates the remedial cleanup and monitoring costs will total \$58.1 million. (DTR §32.7.1, at p. 32-40.) During the discovery period, the Port sought and received responses from its tenants confirming that the tenants have adequate assets, whether in the form of traditional financial assets or insurance assets, to perform the cleanup. As detailed below, the Port's current and historic tenants have more than adequate financial and insurance assets - at least \$800 million. This is exclusive of the available financial and insurance assets of other dischargers such as the Navy and the City of San Diego.

Additionally, the Port's tenants have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability. (See, e.g., SAR 159273, 159289 at paragraph 21 [NASSCO Lease]; Exhibit "7" [SDG&E Tidelands Use and Occupancy Permit Excerpt], p. 5, paragraph 10; SAR 159307, 159324 at paragraph 20 [Southwest Marine Lease]; Exhibit "8" [Southwest Marine Lease Amendment No. 4 Changing Name to BAE Systems San Diego Ship Repair, Inc.].) Consequently, the tenants' significant assets would be applicable to the Port's responsibility for any alleged "orphan shares" under these indemnity agreements. There is, therefore, no basis to conclude that the Port's tenants will be unable to cover the costs of remediation.

### 1. BAE

During the administrative discovery process, BAE stipulated that "it has the financial assets to cover any amounts of the cleanup and remedial monitoring under [the TCAO] which are premised upon BAE's established liability for the time period 1979 to the present with respect to the BAE leasehold only and that are ultimately allocated to BAE." (Exhibit "9" [BAE Stipulation].) Based on its review of BAE's insurance documents, the Port believes BAE has tens of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "10" [Summary of BAE Historic Liability Insurance].)

### 2. NASSCO

During the administrative discovery process, NASSCO stipulated that "it has the financial assets to cover the amount of the [TCAO] that are ultimately allocated to NASSCO." (Exhibit "11" [NASSCO Stipulation].) Additionally, based on its review of relevant documents, the Port believes that NASSCO has hundreds of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "12" [Summary of NASSCO Historic Liability Insurance].)

### 3. SDG&E

During the administrative discovery process, SDG&E produced documentation of its insurance profile. Based on its review of these and other relevant documents, the Port believes that SDG&E has hundreds of millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "13" [Summary of SDG&E Historic Liability Insurance].)

#### 4. Campbell

During the administrative discovery process, Campbell produced documents regarding its insurance profile. Based on its review of these and other relevant documents, the Port believes that Campbell has tens of millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "14" [Summary of Campbell Historic Liability Insurance].)

#### 5. Star & Crescent Boat Company

Based on its review of relevant documents, the Port believes that Star & Crescent has millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit "15" [Summary of Star & Crescent Boat Company Historic Liability Insurance].) Additionally, Star & Crescent has stipulated that it has assets totaling between \$750,000 and \$1 million. (Exhibit "16" [Star & Crescent Stipulation].) Given Star & Crescent's likely limited share of liability for the Shipyard Sediment Site in comparison to the other dischargers, the combination of insurance and financial assets eliminate any likelihood that there will be any "orphan share" assigned to the Port.

The Port is aware that the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site. However, this dispute does not present the risk of significant "orphan share" liability that could potentially be assigned to the Port. Regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site, the identified insurance assets would still apply, so long as the insured entity is named as a discharger under the TCAO and DTR. Thus, if the TCAO and DTR were amended to name all of the potentially liable entities - San Diego Marine Construction Company, Star and Crescent Boat Company and Star & Crescent Investment Co. — the insurance assets should be available to address directly any established liability, whether or not these entities are still in existence. (See, California Insurance Code §11580(b)(2).)

**Comment ID:** 22

**Organization:** Port District

**DTR Section:** 11.2.

**Comment:**

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The Port's Tenants Are Cooperative

TCAO Finding 11  
DTR §11.2

In addition to possessing more than adequate financial assets to conduct the remediation, the Port's tenants are currently cooperating with the Regional Board. Although the tenants have been proposing a remedial approach that differs in some respects from the remedial approach proposed by the CUT, the process is "proceeding cooperatively." (Exhibit "5" [Barker Deposition], Vol. III, 489:20-490:14.)

#### IV. There is no Evidence of Port Non-Cooperation

In contrast to the extensive evidence provided above regarding the Port's history of prior cooperation with the Regional Board in achieving remediation of numerous environmental challenges throughout the San Diego Bay area and cooperation with the Regional Board in the specific context of this matter, the CUT has contended in its administrative discovery responses that the Port was named as a discharger because it has not cooperated with the CUT during this process.

The Port notes that the allegation of non-cooperation is not contained in the TCAO or DTR. This absence confirms that, at least as of the date of the most recent TCAO and DTR, no issue regarding the Port's cooperation existed. In fact, the concern regarding Port cooperation is not grounded in fact. When asked to identify the basis for the allegations of non-cooperation, the witnesses testified to concerns that the Port was not supporting the remedial footprint and was not going to produce witnesses to confirm this support. (Exhibit "5" [Barker Deposition], Vol. III, 520:7-21, 521:23-522:24; Exhibit "1" [Gibson Deposition], 33:9-22.) As detailed above, the Port has produced expert witnesses to support the remedial footprint. Likewise, the witnesses testified that the Port had not been supportive of efforts to locate a site for dewatering or disposal of the dredged sediments. (Exhibit "5" [Barker Deposition], Vol. III, 523:4-21.) Again, as noted above, the Port is working with the CUT to explore solutions to this issue and is working to provide appropriate support in the CEQA process. (See, Exhibit "5" [Barker Deposition], Vol. III, 527:23-529:6.)

The only other basis for the allegation of non-cooperation was the Port's decision to withdraw from the mediation process. (Exhibit "1" [Gibson Deposition], 33:9-34:10, 44:5-13; Exhibit "6" [Carlisle Deposition], 110:20-23.) However, as noted, the Port's withdrawal from a voluntary mediation process that it initially proposed is an inappropriate basis for naming the Port as a primary discharger, as a matter of law. Further, any implication that the mediation withdrawal constitutes Port non-cooperation or opposition to the TCAO process is directly rebutted by the Port's cooperation cited above. In sum, the Port has provided and continues to provide appropriate cooperation during the TCAO process.

**Comment ID:** 23  
**DTR Section:** 4.4.

**Organization:** City of San Diego

**Comment:**

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COMMENT 2.0: THE DTR'S CONCLUSIONS THAT DISCHARGES FROM SW9 HAVE CONTRIBUTED TO ELEVATED LEVELS OF CONSTITUENTS OF CONCERN OBSERVED IN SHIPYARD SEDIMENTS ARE NOT SUPPORTED BY ADEQUATE DATA.

The DTR quotes the following allegation from Tentative Cleanup and Abatement Order (TCAO), Finding 4:

"The City of San Diego also owns and operates a municipal separate storm sewer system (MS4) through which it discharges waste commonly found in urban runoff to San Diego Bay subject to the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit. The San Diego Water Board alleges, but the City of San Diego denies, that the City of San

Diego has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. The waste includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR page 4-1 (emphasis added).)

The DTR further alleges:

"The City of San Diego has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and 10 PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR page 4-6 (emphasis added).)

The DTR states at section 4.7.3:

"Surface sediment data at NASSCO sample station NA22, which is located near the SW9 storm drain outfall shows elevated concentrations of total high-molecular-weight polynuclear aromatic hydrocarbons (Total HPAHs) at 3600 ug/kg, Dichlorodiphenyltrichloroethane (DDT) at 29.7ug/kg), and Chlordane at 21.1 ug/kg. These pollutant levels are indicators of an urban runoff source (Exponent, 2003) and therefore indicate that historical urban runoff discharges occurred from the City via the SW9 outfall.

As described above, the surface sediment data at NASSCO sample station NA22 provides evidence that the City of San Diego MS4 Storm Drain SW9 conveys the HPAHs, DDT, and Chlordane pollutants into the NASSCO leasehold and San Diego Bay at the Shipyard Sediment Site. The urban runoff characteristics of the sediment pollutants at Station NA22 adjacent to the City of San Diego's MS4 Storm Drain SW9 provide evidence that the City has discharged pollutants to the Shipyard Sediment Site, both presently and in the past." (DTR page 4-19.)

Thus, Sections 4.6 and 4.7.3 of the DTR set forth certain conclusions regarding the contents of storm water released through SW9.

Neither of these conclusions is based on reliable data. First, no samples of stormwater have ever been collected from the SW9 storm drain. Second, Section 4.7.3 of the DTR is basing its



conclusions entirely on the results of a single sediment sample collected from the Bay at NA-22. Given NA-22's proximity to large ship repair, moorage, and other industrial waterfront operations, the DTR's claims that concentrations of chemicals found at NA-22 can be attributed to SW9 because urban runoff "typically" contains pollutants is inappropriate (RWQCB, 1972, 1994; USEPA, 1974; Pacific Northwest Pollution Prevention Resource Center, 1997; Schafran et al, 1998; Anchor Environmental, 2005; United States Department of Navy (USDN), 2006), Science Applications International Corporation (SAIC), 2007). The toxins in the sediment data are attributable to nearby industrial activity, and there is no basis set forth in the DTR for attributing the pollutant levels to discharges from SW9.

Third, SW9 discharges into the mouth of Chollas Creek. Water leaving SW9 will be subject to the same hydrodynamic forces as water leaving Chollas Creek during a storm event. As noted above (see Comment 1.1), the studies conducted to date do not show that suspended solids from this discharge cause toxicity in shipyard sediments.

Fourth, historically, prior to the year 2000 timeframe, SW9 drained the NASSCO leasehold, which, based on the types and quantities of wastes produced in ship building and repair operations, is likely to have contained significant quantities of chemicals of concern found in Shipyards sediments.

#### REFERENCES FOR COMMENT 2.0

Anchor Environmental, CA LP. 2005. Site Investigation and Characterization Report for 401 Certification. BAE Systems, Inc. (formerly Southwest Marine, Inc.). Bulkhead Extension and Yard Improvement. Phase II Activities. August.

California Regional Water Quality Control Board San Diego Region, 1972. Wastes Associated with Shipbuilding and Repair Facilities in San Diego Bay. A staff report to the Executive Officer of the San Diego Regional Water Quality Control Board. June.

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Schafran, G.C., J.G. Winfield, P. Pommerenk, A.O. Akan, L. Mizelle, and IJ. Fox. 1998. Stormwater Collection, treatment, Recycling, and Reuse in a Shipyard. Final Report. NSRP Project N1-96-07. Center for Advanced Ship Repair and Maintenance (CASRM) Old Dominion University Prepared for The National Shipbuilding Research Program NSRP 0536 May 26,1999. December 31.

Science Applications International Corporation. 2007. Lower Duwamish Waterway Glacier Bay Source Control Area Summary of Existing Information and Identification of Data Gaps. Prepared for Washington State Department of Ecology, Lacey, Washington 98504. June.

Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

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United States Environmental Protection Agency (USEPA). 1974. Draft Report to the San Diego Regional Water Quality Control Board on Guidelines for the Control of Shipyard Pollutants. Prepared by Environmental Protection Agency National field Investigations Center - Denver. July 1.

**Comment ID:** 24

**Organization:** Port District

**DTR Section:** 11.3.

**Comment:**

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The Port Has not Discharged Contamination from its MS4 Facilities

TCAO Finding 11

DTR §11.3

As a secondary basis for Port designation, the TCAO and DTR allege that the Port should be named as a discharger based upon its ownership and operation of MS4 facilities that have purportedly discharged contamination. Specifically, the TCAO and DTR allege that MS4 facilities owned or operated by the Port have discharged through the SW4 and SW9 outfalls and minor storm drains. However, the evidence in the record does not support this basis for Port discharger liability.

**Comment ID:** 25

**Organization:** City of San Diego

**DTR Section:** 4.4

**Comment:**

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COMMENT 3.0: THERE ARE NO DATA INDICATING THAT SW4 HAS CONTRIBUTED SIGNIFICANTLY TO ELEVATED LEVELS OF CONSTITUENTS OF CONCERN OBSERVED IN SHIPYARD SEDIMENTS.

The DTR quotes the following allegation from TCAO, finding 4 the San Diego Water Board alleges that the City of San Diego has, as cited on page 4-1 of the DTR:

" ... The waste [in urban storm water discharges] includes metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total suspended solids, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR, page 4-1.)

The DTR further alleges:

" .... The pollutants [in urban storm water discharges] include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic

activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR, Section 4.4, page 4-6.)

The DTR section 4.7.2 states:

" .... Although no monitoring data is available for this outfall (sic SW4), it is highly probable that historical and current discharges from this outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site.

Recent evidence of illicit discharges from the City of San Diego's Storm Drain SW4 into the Shipyard Sediment Site is provided by the results of a recent sampling investigation conducted by the City of San Diego. On October 3, 2005, the City of San Diego ... obtained evidence of an illegal discharge into the SW4 MS4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line .... The results of these 0 samples indicate the presence of both PCBs and PAHs entering and exiting the municipal storm drain system catch basin and resulted in the City of San Diego issuing a Notice of Violation (NOV) to SDG&E." (DTR, section 4.7.2, pages 4-15, 4-16.)

DTR section 4.7.2 further states:

"The City of San Diego MS4 Storm Drain SW4 discharges into BAE Systems leasehold between Piers 3 and 4. Sample stations from the Detailed Sediment Investigation (Exponent, 2003) in the area of this outfall include SW20 and SW25." (DTR, Section 4.7.2, page 4-17.)

DTR section 4.7.2 further states:

"Sediment PCB levels, specifically Aroclor-1254 and 1260, and sediment PAH levels reported in the storm water conveyance system (sic: catch basin) are also reported in the bay sediment near the storm water outfalls ... " (DTR, Section 4.7.2, page 4-18.)

Thus, Sections 4.6 and 4.7.2 of the DTR set forth certain conclusions regarding the contents of storm water released through SW4. These conclusions are not based on reliable data.

No storm water samples have ever been collected from SW4. The watershed drained by SW4 differs in size and land use from the watershed drained by Chollas Creek. There are no data that would show that Chollas Creek storm water is chemically similar to SW4 storm water. Therefore, it is inappropriate to conclude that SW4 carried the same pollutants to the Shipyard that the Chollas Creek carries to its mouth.

With respect to the catch basin sampling event, following the sampling event in 2005, the catch basin was cleaned out by SDG&E per the requirements in the Notice of Violation issued by the City of San Diego to SDG&E (Zirkle, 2005; TN& Associates, 2006). There are no data showing that SW4 currently has any PCBs in it or that it is currently contributing to pollution of sediments at the Shipyards site.

The presence of chemicals of concern at sediment sampling stations SW20 through SW25 where ship building, ship repair, ship mooring, and ship moving operations took place does not indicate that the chemicals of concern came from SW4 in sufficient quantity to cause the observed concentrations or effects in those sediments. In fact, ship building, ship repair, ship mooring, and ship moving operations have been documented to have historically produced and discharged significant quantities of wastes containing the chemicals of concern found at the Shipyard site (RWQCB, 1972, 1994; USEPA, 1974; Pacific Northwest Pollution Prevention Resource Center, 1997; Schafran et al, 1998; Anchor Environmental, 2005; United States Department of Navy (USDN), 2006), Science Applications International Corporation (SAIC), 2007)

Historically, prior to the year 2000 timeframe, SW4 drained the BAE leasehold. Based on the types and quantities of wastes produced in ship building and repair operations, runoff from the BAE leasehold is likely to have contained significant quantities of chemicals of concern found in Shipyards sediments.

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Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

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Zirkle, Chris (2005); Letter to Lloyd A Schwartz, BAE Systems San Diego Ship Repair, Inc.; Unauthorized Discharge of toxic Pollutants into the Municipal Storm Drain System; October 14, 2005.

**Comment ID:** 26

**Organization:** Port District

**DTR Section:** 11.3.1. and 11.4.

**Comment:**

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The Port Does not Own or Operate SW4 or SW9

TCAO Finding 11  
DTR §§11.3.1,11.4

The DTR states that the Port "operates the following MS4 storm drains which convey urban runoff from source areas up-gradient of the Shipyard Sediment Site's property and discharge directly or indirectly into San Diego Bay within the NASSCO and BAE Systems leasehold: ... Storm Drain SW4; Storm Drain SW9." (DTR §11.3.1, at pp. 11-5 to 11-7.) Elsewhere, the DTR alleges that the Port has discharged pollutants 'through its SW4 ... and SW9 MS4 conduit pipes, as well as other minor drains on its tidelands property and watershed." (DTR §11.4, at p. 11-8.)

These statements are incorrect. The Port does not own or operate the SW4 or SW9 outfall or the MS4 facilities leading to these outfalls. Rather, as the CUT has acknowledged in its administrative discovery responses, both outfalls (SW4 and SW9) and related MS4 facilities are operated by the City under an easement, (Exhibit "17" [CUT Discovery Responses Excerpts], Responses to Special Interrogatories 28, 30.) The City has similarly acknowledged that its "storm drain system enters the NASSCO leasehold at the foot to 28\* Street and terminates at the southeasterly comer" where it "discharges into Chollas Creek" at the SW9 outfall. (See, SAR 158787, 158971, 158806 [2004 City Storm Water Pollution Prevention Program Report].) The City has an easement for the MS4 facilities that terminate at the SW4 outfall. (Exhibit "18" [City Easement].) Moreover, the City retained easements for "all water, sewer and drainage facilities, known or unknown" located within the tidelands when the City first conveyed the tidelands in trust to the Port. (Exhibit "19" [Conveyance].) Because there is no evidence the Port has ever owned or operated SW4 and SW9 or the MS4 facilities that lead directly to these outfalls, the Port cannot be held liable for discharges from this portion of the MS4. (Exhibit "20" paragraph 7 [Collacott Declaration].)

The CUT's administrative discovery responses clarify that the TCAO and DTR "do not allege that the Port District manages or operates the portion of the City of San Diego's MS4 that drains to" SW4 and SW9. (Exhibit "17" [CUT Discovery Responses Excepts], Responses to Special Interrogatories Nos. 28, 30.) Rather, the contention is that the Port "is responsible for controlling pollutants into and from its own MS4 system" and that "the Port District cannot passively allow pollutants to be discharged through its MS4 and into another Copermittees' MS4s, like the City of San Diego." (Id [emphasis added].) Yet, neither the DTR nor the administrative discovery responses identify what part of the MS4 owned or operated by the Port would ultimately lead to SW4 or SW9, much less how such MS4 facilities have discharged pollutants to SW4 or SW9.

**Comment ID:** 27

**Organization:** Port District

**DTR Section:** 11.5.

**Comment:**

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There is no Evidence that the Port's MS4 Facilities are Discharging Pollutants to the San Diego Bay

TCAO Finding 11  
DTR §11.5

The DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination.

**Comment ID:** 28

**Organization:** Port District

**DTR Section:** 11.6.4. and 11.6.5.

**Comment:**

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There is no Evidence that SW4 and SW9 are Discharging Contaminants to the Shipyard Sediment Site

TCAO Finding 11  
DTR §§11.6.4,11.6.5

The TCAO and DTR fail to provide evidentiary support for the conclusion that SW4 and SW9 have discharged contaminants to San Diego Bay and the Shipyard Sediment Site. In fact, the DTR acknowledges that "no monitoring data is available" for either SW4 or SW9. (DTR §§11.6.4, at p. 11-13 [SW4]; 11.6.5, at p. 11-15 [SW9].) In lieu of actual monitoring results, the DTR simply concludes that "it is highly probable that historical and current discharges from th[ese] outfalls have discharged" various contaminants. (Id.) Reliance upon assumption rather than evidence as a basis for liability is legally unsound.

In *Natural Resources Defense Council, Inc. v. County of Los Angeles* (2010) 2011U.S.App.LEXIS 4647, 41 Env.L.Rptr. 20109, the claimant alleged the co-permittees on an NPDES permit had discharged various pollutants in violation of the permit. (Exhibit "21" [NRDC Case].) The claimant argued initially that the "measured exceedances in the Watershed

Rivers ipso facto establish Permit violations by Defendants." (NRDC, supra, at \*44.) However, the Ninth Circuit noted that because "the Clean Water Act does not prohibit 'undisputed' exceedances; it prohibits 'discharges' that are not in compliance with the Act (which means in compliance with the NPDES) ... responsibility for those exceedances requires proof that some entity discharged a pollutant." (Id, at \*44-45.)

Against this backdrop, the Ninth Circuit found that "the primary factual dispute between the parties is whether the evidence shows any addition of pollutants by Defendants" to the waterways. (NRDC, supra, at \*45.) The claimant asserted that because "the monitoring stations are downstream from hundreds of miles of storm drains which have generated the pollutants being detected" it was "irrelevant which of the thousands of storm drains were the source of polluted stormwater - as holders of the Permit, Defendants bear responsibility for the detected exceedances." (Id, at \*46.) The Ninth Circuit found this view unsatisfactorily simplistic as it "did not enlighten the district court with sufficient evidence for certain claims and assumed it was obvious to anyone how stormwater makes its way from a parking lot in Pasadena into the MS4, through a mass-emissions station, and then to a Watershed River." (Id, at \*47.)

Ultimately, the Ninth Circuit found adequate evidence of discharges for two of the rivers, where mass emissions stations detecting the exceedances were located in a portion of the MS4 "owned and operated" by the defendant in question. (NRDC, supra, at \*51-52.) In contrast with that conclusion, the Ninth Circuit found that "it is not possible to mete out responsibility for exceedances detected" in these waterways. (Id, at 52.) The Ninth Circuit was "unable to identify the relationship between the MS4 and these mass-emissions stations" and noted that "it appears that both monitoring stations are located within the rivers themselves." (Id.) The Ninth Circuit concluded that "[i]t is highly likely, but on this record nothing more than assumption, that polluted stormwater exits the MS4 controlled by the [defendants], and flows downstream in these rivers past the mass-emissions stations." (Id.) However, this assumption was inadequate because the claimant was "obligated to spell out this process for the district court's consideration and to spotlight how the flow of water from an ms4 'contributed' to a water-quality exceedance detected at the Monitoring Stations." (Id, at 52-53.)

Based on the foregoing, liability requires evidence the co-permittee "discharged" pollutants from an MS4 facility that the co-permittee owns or operates. Testing or monitoring taken from the affected waterway, rather than from the MS4 system, is not adequate. This is so regardless of how "probable" or "likely" the assumption that the defendant may have discharged pollutants. In the present case, there is no evidence that SW4 or SW9 discharged any pollutants. Rather, the TCAO and DTR merely assume such discharges as "highly probable" based upon monitoring results from Chollas Creek. This is indistinguishable from the inadequate approach in National Resources Defense Council and cannot form the basis for liability arising out of the ownership or operation of an MS4 system.

**Comment ID:** 29

**Organization:** Port District

**DTR Section:** 11.6.4. and 11.6.5.

**Comment:**

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There is no Evidence that the Port's MS4 Facilities are Discharging Contaminants to the Shipyard Sediment Site

TCAO Finding 11  
DTR §§11.6.4,11.6.5

Even if there was adequate evidence that SW4 and SW9 are discharging pollutants, there are no monitoring or test results establishing that there have been discharges from the Port's MS4 facilities into the City MS4 facilities that lead to the outfalls at SW4 and SW9. National Resources Defense Council makes clear that there must be evidence that the specific Port MS4 facilities, not the MS4 system generally, are discharging pollutants. This is true regardless of how "probable" it is that such discharges might be taking place. Contrary to the correct legal standard, the DTR broadly and incorrectly identifies the offending Port MS4 facilities as SW4 and SW9. The DTR contains no factual analysis of any actual Port MS4 facilities, much less the content of the discharges from the Port MS4 facilities. In fact, the Port has only very limited MS4 facilities that lead to SW4 and no MS4 facilities leading to SW9.

Furthermore, the Port's status as co-permittee under the NPDES permit since 1990 does not make it liable for any and all discharges from SW4 and SW9, regardless of whether the Port's MS4 facilities discharged pollutants. Likewise, the Port is not broadly liable under the NPDES permit for its tenants' discharges into a portion of the MS4 system that the Port does not own or operate. There is no language in the NPDES permit that purports to impose such broad joint liability upon the Port. Such an interpretation of the NPDES permit would be contrary to the terms of the Clean Water Act, which is the basis for the NPDES permit. Under the Clean Water Act, a "co-permittee" is defined as "a permittee to an NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator." (40 Code of Federal Regulations § 122.26(b)(1).) This is further reflected in the analysis in National Resources Defense Council, in which the Ninth Circuit focused on and required evidence of discharges from specific MS4 facilities owned and operated by the defendants, not from the MS4 system generally.

In sum, the Port is responsible only for discharges from MS4 facilities that it owns or operates. The Port's status as co-permittee under the NPDES permit does not support the conclusion that the Port owns or operates the entire MS4 system. Likewise, the Port's status as trustee of tidelands property does not support the conclusion that the Port owns or operates all MS4 facilities located on that property. In the absence of evidence linking discharges of pollutants from a specific portion of the MS4 system that the Port owns or operates, the Port is not responsible under the NPDES permit for those discharges.

**Comment ID:** 30  
**DTR Section:** 11.6.5.

**Organization:** Port District

**Comment:**

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There is no Evidence that SW9 Discharges are Contaminating the Shipyard Sediment Site

TCAO Finding 11



DTR §§11.6.5

The Port's designated expert, Dr. Ying Poon, has done an extensive fate and transport modeling analysis and confirmed that any discharges from Chollas Creek would not result in any significant deposit, accumulation or resedimentation of the Shipyard Sediment Site. (Exhibit "2" [Port Expert Designation]; Exhibit "4" [Dr. Poon Declaration], paragraphs[13-15]) This extensive modeling contradicts the assumption in the TCAO that, based upon the erroneous Exponent Report approach, Chollas Creek flows result in the settling of contaminated sediment at the Shipyard Sediment Site. In the absence of any substantial evidence that SW9 discharges are transporting contaminants to the Shipyard Sediment Site, the Port cannot be liable based upon these alleged discharges.

**Comment ID:** 31

**Organization:** NASSCO

**DTR Section:** 13

**Comment:**

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NOTE: COMMENT RECORDS 2 THROUGH 5 ARE FROM THE "EXECUTIVE SUMMARY OF COMMENTS" AND CONTAIN MULTIPLE COMMENTS THAT ARE ALSO ENTERED INDIVIDUALLY ELSEWHERE IN THIS DATABASE

I. Executive Summary of Comments

The following is a summary of NASSCO's primary comments concerning the TCAO:

A. The Tentative Cleanup and Abatement Order Is Excessively Conservative And Does Not Accurately Reflect The Favorable Conditions Observed At The Site (Findings 13-28)

The TCAO is highly conservative and proposes unprecedented cleanup levels, despite the favorable findings and conclusions of a multimillion dollar sediment investigation conducted by Exponent, with substantial input and oversight by Board staff NASSCO and Southwest Marine Detailed Sediment Investigation, Exponent (October 2003) ("Exponent Report"). This investigation, recognized as the most extensive sediment investigation that the Board has ever required to be conducted in San Diego Bay, concluded that beneficial uses at the Site are not unreasonably impaired, and documented the presence of healthy and mature benthic communities. [Comment No.1, TCAO, at 13-28, DTR, at 13-28]. To the extent minor differences from reference conditions were observed with respect to aquatic life, such effects were largely attributable to ongoing discharges from Chollas Creek. [Comment No.2, TCAO, at 14-20, DTR, at 14-20]. Current site conditions were found to already be protective of aquatic-dependent wildlife and human health. [Comment No.3, TCAO, at 21-28, DTR, at 2128]. For these reasons, and because active remediation would not produce any clear long-term improvement in beneficial uses relative to current conditions, the Exponent Report concluded that monitored natural attenuation is the preferred remedy. This recommendation was subsequently validated when testing conducted by Exponent in June 2009 documented that shipyard contaminants are, in fact, naturally attenuating. However, in stark contrast to these favorable results, the TCAO concludes that beneficial uses are impaired, utilizing a series of excessively conservative, and unwarranted, assumptions which do not accurately represent the favorable conditions present at the Site. Accordingly, NASSCO is concerned that, in attempting to be conservative, Staff has

greatly overstated the risks posed by site sediments. [Comment No.4, TCAO, at 14-28, DTR, at 14-28].

**Comment ID:** 32  
**DTR Section:** 12

**Organization:** NASSCO

**Comment:**

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NOTE: COMMENT RECORDS 2 THROUGH 5 ARE FROM THE "EXECUTIVE SUMMARY OF COMMENTS" AND CONTAIN MULTIPLE COMMENTS THAT ARE ALSO ENTERED INDIVIDUALLY ELSEWHERE IN THIS DATABASE

I. Executive Summary of Comments

The following is a summary of NASSCO's primary comments concerning the TCAO:

I.B. Chollas Creek And Other Sources Of Off-Site Discharges Must Be Controlled Before The Cleanup Goals In The TCAO Can Be Achieved  
(Findings 12, 30, 32, 33)

NASSCO is likewise concerned that Staff has proposed extensive dredging to unprecedented cleanup levels, at a cost of millions of dollars, despite the fact that ongoing uncontrolled discharges from Chollas Creek are impacting the Site, and are not expected to be controlled for at least 20 years. [Comment No.5, TCAO, at 12,30,32,33, DTR, at 12.1,30, 32.7.1,33.1.1]. It is axiomatic that source control must be achieved prior to active remediation and common sense dictates that is a waste of resources to spend millions to remediate a site that is at risk of recontamination. It is also not technologically feasible to require compliance with the exceptionally stringent cleanup levels proposed in the TCAO while the Site continues to be impacted by uncontrolled discharges from Chollas Creek. [Comment No.6, TCAO, at 12,30, 32,33, DTR, at 12.1, 30, 32.7.1, 33.1.1]. Accordingly, Chollas Creek and other sources must be controlled before the cleanup goals in the TcAo can be achieved through active remediation. [Comment No.7, TCAO, at 12,30,32,33, DTR. at 12.1,30,32.7.1, 33.1.1].

**Comment ID:** 33  
**DTR Section:** 32

**Organization:** NASSCO

**Comment:**

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NOTE: COMMENT RECORDS 2 THROUGH 5 ARE FROM THE "EXECUTIVE SUMMARY OF COMMENTS" AND CONTAIN MULTIPLE COMMENTS THAT ARE ALSO ENTERED INDIVIDUALLY ELSEWHERE IN THIS DATABASE

I. Executive Summary of Comments

The following is a summary of NASSCO's primary comments concerning the TCAO:

I.C. The Tentative Cleanup and Abatement Order Treats NASSCO Differently Than Other Similar Sites, In Violation of Law (Findings 32, 36)

The TCAO violates the consistency requirement that is expressly stated in Resolution No. 92-49, as well as related principles of due process and equal protection by proposing cleanup levels that are far more stringent than what has been required at other similarly situated shipyard and boatyard sites in San Diego Bay and elsewhere. Fundamental fairness dictates that similarly situated sites should be treated similarly, and there is no rational basis for treating NASSCO differently than other comparable sites in the same water body, especially in light of overall condition of the site, as documented in the sediment investigation and Exponent Report. [Comment No.8, TCAO, at 32, 36, DTR. at 32, 36.4].

**Comment ID:** 34

**Organization:** NASSCO

**DTR Section:** 30. 32.

**Comment:**

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NOTE: COMMENT RECORDS 2 THROUGH 5 ARE FROM THE "EXECUTIVE SUMMARY OF COMMENTS" AND MAY CONTAIN MULTIPLE COMMENTS THAT ARE ALSO ENTERED INDIVIDUALLY ELSEWHERE IN THIS DATABASE

I. Executive Summary of Comments

The following is a summary of NASSCO's primary comments concerning the TCAO:

I.D. Monitored Natural Attenuation Is The Proper Remedy (Findings 30, 32)

The Regional Board is required to adopt a technically and legally sound TCAO based upon an accurate risk-based assessment, and reasonable assumptions, in accordance with Resolution No. 92-49. In light of the generally favorable site conditions and total values at stake, monitored natural attenuation-which has already been shown to be occurring-is the proper remedy for the NASSCO Site. [Comment No.9, TCAO, at 30, 32, DTR. at 30, 32].

**Comment ID:** 35

**Organization:** NASSCO

**DTR Section:** 36.

**Comment:**

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NOTE NASSCO'S COMMENTS No. 10 AND No. 11 ARE CONTAINED HEREIN

II. REGULATORY FRAMEWORK

A. California Porter-Cologne Water Quality Control Act (Finding 36)

II.A.1. The Water Code Recognizes That Beneficial Uses Are Not Unreasonably Affected By All Changes To Chemical Concentrations In Sediments (Comment No. 10, TCAO, at 36, DTR. at 36)

The Porter-Cologne Act ("the Act") establishes the framework pursuant to which the Regional Board may reasonably protect water quality in California. Cal. Water Code §§ 13000 et seq.

The Act mandates that a balancing process be followed in regulating activities and factors that affect the state's water quality. According to the Legislature, such activities "shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." Cal. Water Code § 13000 (emphasis added). The Act also recognizes that "it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses." Cal. Water Code § 13241 . The Act therefore identifies factors that the Regional Board must consider in determining what level of protection is reasonable, including economic considerations. Id.

The State Water Resources Control Board ("State Board") and the Regional Boards are the state agencies with primary responsibility for the coordination and control of water quality, and must conform to and implement the Water Code in exercising their responsibilities. Cal. Water Code § 13001 . The Regional Board discharges its duty to coordinate and control water quality by, among other things, investigating the quality of waters of the state and requiring the cleanup or abatement of waste, including through the issuance of Cleanup and Abatement Orders ("CAOs") when a discharge "creates, or threatens to create a condition of pollution or nuisance. . ." Cal. Water Code §§ 13225, 13304. "Pollution" means "an alteration of the quality of the water of the state by waste to a degree which UNREASONABLY affects either ... (A) The waters for beneficial uses[,] or (B) Facilities which serve these beneficial uses." Cal. Water Code § 13050(1) (emphasis added). Restated, it is not considered "pollution" where a past discharge affects beneficial uses, but does not do so unreasonably. Similarly, "nuisance" means "anything which meets all of the following requirements:

- (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
- (2) Affects at the same time an entire community or neighborhood or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
- (3) Occurs during, or as a result of, the treatment or disposal of wastes."

Cal. Water Code § 13050(m). Contaminated sediment does not constitute a nuisance where it is not proven to be injurious to health, or, if it is not proven to be injurious to health, does not affect an entire community. Thus, it is clear that the definitions of "pollution" and "nuisance" recognize that at certain concentrations, contaminants in sediment may not unreasonably affect beneficial uses of the waters of the state or be injurious to health. [Comment No. II, TCAO, at 36, DTR, at 36]. Indeed, this a logical and reasonable result. If a discharger could never impact sediment quality to any degree, then the Regional Board could never issue NPDES permits or Waste Discharge Requirements that involved the discharge to any water body. Hence, the Water Code allows some minor impacts to sediment quality, as long as those impacts do not unreasonably impair beneficial uses.

**Comment ID:** 39

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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I. The Law Requires Cleanup to Background Except Where Evidence in the Record Demonstrates that Alternative Cleanup Levels Greater than Background Water Quality are Appropriate.

The State Water Resources Control Board has empowered the Regional Boards "to require complete cleanup of all waste discharged and restoration of affected water to background conditions (i.e., the water quality that existed before the discharge)." See State Water Board Order 92-49. When ordering a cleanup, the Regional Board must "[e]nsure that dischargers are required to clean up and abate the effects of discharges" to "either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." State Water Board Order 92-49. Therefore, cleanup must be set to background pollutant levels unless background water quality "cannot be restored."

**Comment ID:** 40

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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I.A. Cleanup to a Pollutant Level Greater than Background Conditions is Only Allowed if the Regional Board Makes Two Findings.

The law provides that the Regional Board can establish alternative cleanup levels for constituents greater than background pollutant levels only if the Regional Board makes two findings. First, it must find "that it is technologically or economically infeasible to achieve the background value for that constituent." The Post Remedial Monitoring plan should be expanded to provide a more robust basis for evaluating exposure of benthic invertebrates to contaminants at the site and for assessing sediment toxicity, and include testing from appropriate reference sites 2550.4(c). If cleanup to background is technologically or economically infeasible, a pollutant level greater than background conditions can be adopted only if the Regional Board finds "that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the concentration limit greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c). The cleanup levels must be set at background water quality if the Regional Board fails to make these two findings for each pollutant.

**Comment ID:** 41

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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I.B. Alternative Cleanup Levels Must Be a Concentration Limit Set on a Constituent-by-Constituent Basis and Must Meet Requirements in State Water Board Order 92-49.

The law governing alternative cleanup levels makes clear that the alternative cleanup levels MUST set a concentration limit, or maximum pollutant amount that cannot be exceeded. The Regional Board must find that the constituent will not pose a threat to human health or the environment "as long as the CONCENTRATION LIMIT greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c) (emphasis added). Therefore, alternative cleanup levels that are not set at a maximum pollutant level are unlawful. •

The law also dictates that analyzing whether background levels are achievable and what alternative cleanup levels are appropriate must be done on a constituent-by-constituent basis. See CAL. CODE REGS. tit. 23 § 2550.4(c) (The Regional Board must determine technological and economic feasibility "to achieve the background value FOR THAT CONSTITUENT" and find that "THE CONSTITUENT will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded." (emphasis added)).

Finally, State Water Board Order 92-49 requires that any alternative cleanup level:

- 1) must be consistent with the maximum benefit to the people of the state;
- 2) must not unreasonably affect present and anticipated beneficial uses of the waterbody; and
- 3) must not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

**Comment ID:** 42

**Organization:** Coastkeeper and EHC

**DTR Section:** 32

**Comment:**

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I.C. The Regional Board's Findings Must be Supported By Evidence in the Record.

Decisions of the Regional Board must be made on a reasoned basis and be supported by evidence in the record. A reviewing court will overturn a Regional Board decision "if the court determines that the findings are not supported by the weight of the evidence." CAL. Civ.

PROC. CODE § 1094.5(c). For an agency finding to be upheld, the agency's findings must be "supported by substantial evidence" in the record. See *JKH Enter, v. Dep't of Industrial Relations*. 48 Cal. Rptr. 3d 563. 574 (Cal. Ct. App. 2006).

Therefore, in order to set a cleanup level at less than background water quality, the Regional Board's finding of technical or economic infeasibility must be supported by substantial evidence in the record. Also, there must be substantial evidence in the record demonstrating (1) that the remaining pollutant levels "will not pose a substantial present or potential hazard to human health or the environment as long as the concentration limit greater than background is not exceeded." Cal. Code Regs. tit. 23 §2550.4(c), (2) that the alternative cleanup levels are consistent with the maximum benefit to the people of the state; (3) that the alternative cleanup levels will not unreasonably affect present and anticipated beneficial uses of San Diego Bay; and (4) the alternative cleanup levels will not result in water quality less than that prescribed in the

State and Regional Boards' Water Quality Control Plans and Policies. See State Water Board Order 92-49.

**Comment ID:** 43  
**DTR Section:** 31

**Organization:** Coastkeeper and EHC

**Comment:**

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II. The Order's Conclusion that Cleanup to Background Water Quality Levels is Economically Infeasible is Arbitrary and Capricious and Not Supported By Substantial Evidence in the Record.

The first step in determining appropriate cleanup levels—background or some other level—is assessing the technological and economic feasibility of cleaning to background pollutant levels. The Order determined that cleaning to background is technologically feasible. See Order Finding 30. This means that the economic feasibility analysis determines whether alternative cleanup levels will be considered, and if so, what that level should be.

Because the economic feasibility analysis drives the entire cleanup, it is imperative that the economic feasibility is a fair analysis, supported with evidence in the record cited to its sources, which is fairly presented. But the economic feasibility analysis in Section 31 of the DTR fails to provide support for its assumptions, fails to provide the source of data used in the analysis, analyzes the cleanup arbitrarily in eleven groups of six polygons, presents the analysis in four arbitrary groups, and then arbitrarily proclaims that \$33 million is the cut-off for where the incremental costs exceed the incremental benefits.

This arbitrary and unsupported economic feasibility analysis leads to an arbitrary determination that cleanup to background is not economically feasible. More importantly, it has also led to an arbitrary determination of what level of cleanup is the "best water quality reasonable" given all considerations. See State Water Board Order 92-49.

**Comment ID:** 44  
**DTR Section:** 31.1.

**Organization:** Coastkeeper and EHC

**Comment:**

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II.A. The Economic Feasibility Analysis Arbitrarily Assessed Costs in Six-Polygon Groups.

The DTR admits that the economic feasibility of remediating the Shipyard Sediment Site to background levels was assessed using a "series of cumulative cost scenarios, starting with the "six most contaminated stations, then adding the six next most contaminated stations, progressing sequentially down the list until the entire Shipyard Sediment Site was included in the scenario." DTR §31.1 at 31 -2.

The DTR provides no explanation or rationale as to why stations were evaluated in groups of six. There is no biological or economic reason for the polygons to be evaluated in groups of six, particularly when the polygons are different sizes and six polygon groups do not necessarily represent one construction season or other grouping in which a consideration of economies of scale could have reduced costs.

Furthermore, by lumping the polygons together in groups of six, the analysis fails to provide the data to allow the Regional Board to determine that the alternative cleanup level should be set at a level that falls in between the groups of six polygons.

**Comment ID:** 45

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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II.B. The DTR and Appendices Fail to Detail the Assumptions in the Economic Feasibility Analysis and Provide Information as to the Source of the Information Used in the Analysis.

The Regional Board's conclusions must be supported by substantial evidence in the record. Sec CAL. Civ. PROC. CODE § 1094.5(c). However, the economic feasibility analysis is not supported by substantial evidence in the record. The key information, including cost assumptions, pollution reduction assumptions, and dredging volume assumptions are either not provided or have been provided without a citation as to the source of the information. Failing to provide this information prevents the public from fully vetting the analysis and renders any Regional Board decision based on incomplete information or information not in the record arbitrary and capricious.

**Comment ID:** 46

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Appendix 31, Table A31-1

**Comment:**

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II.B.1. The economic feasibility analysis fails to identify the source of data for the surface weighted average concentration of the five priority pollutants.

Table A31 -1 columns labeled "SWAC." DTR Appendix 31; Table A31 -1. The source of this data has not been provided in the record. It must be provided to allow the public to evaluate the economic analysis and to perform additional analysis.

**Comment ID:** 47

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Appendix 31, Table A31-1

**Comment:**

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II.B.2. The record fails to identify the source of the cost data in Table A31-1.

Table A31-1 contains cost data. The record fails to identify the source of data or itemize the costs so that the public can analyze the cost assumptions and the elements that underlie the cost conclusions.



Counsel for San Diego Coastkeeper and Environmental Health Coalition were provided an excel spreadsheet labeled "Economic Feasibility Source data" by counsel for the Cleanup Team on March 24, 2011. The document was provided without an administrative record citation and therefore it is assumed that this information is not currently a part of the administrative record. The file fails to indicate the source(s) for this economic feasibility data and this information has not been provided to the public.

This spreadsheet contains cost assumptions that are suspect. For example, the spreadsheet assumes that eelgrass mitigation will be required for five percent of the total dredging area for each six-polygon scenario. There is no showing that this is an appropriate assumption, nor is there any information about the source of the costs assumptions for "Eelgrass Habitat Mitigation" and "Eelgrass Land Lease Costs (in perpetuity)"/ Without this information, the public cannot evaluate the reliability of that data and assumptions.

**Comment ID:** 48

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Table A31-2

**Comment:**

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II.B.3. The record fails to identify the source of the data in Table A31-2.

Table A31-2 contains data regarding polygon area, volume and dredging depths and volumes. The record fails to identify the source of this data so that the public can analyze the data and assumptions.

**Comment ID:** 49

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Appendix 31, Table A31-2

**Comment:**

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II.B.4. There is no explanation in the economic feasibility analysis why polygons identified with a "depth to clean" as the undefined term "sur" have differing "dredging depth|s|."

Table A31-2 includes the undefined term "sur" for several polygons in the "depth to clean" column. Determining what the term "sur" is supposed to mean becomes challenging because the dredging depth varies for polygons with "depth to clean" listed as "sur." For example, "Depth to clean" for SW05 is "sur" while the "Dredging Depth" is 5; "Depth to clean" for SW23 is "sur" while the "Dredging Depth" is 3; and "Depth to clean" for NA15 is "sur" while the "Dredging Depth" is 7. The record provides no explanation as to why these three polygons that all have "Depth to Clean" listed as "sur," have such varied dredging depths or how "Dredging Depth" was determined for rows where "Depth to Clean (ft)" is listed as "sur." See 2010-07-27 Economic feasibility 07-27-10.ng.xls (SAR384569).

If "sur" means that only surficial data is available, the record must explain why additional sampling to determine appropriate dredging depth was not collected. Further, if dredging depth from polygons labeled "sur" was assumed based on dredging depth at an adjacent polygon, the

record must explain how such an assumption could be valid and explain the consequences of that assumption to the cost assumptions.

**Comment ID:** 50

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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II.C. The Economic Feasibility Results are Presented in an Arbitrary Manner.

The economic feasibility analysis must be supported by substantial evidence in record and must be presented in a fair manner so that conclusions drawn from the analysis are not arbitrary and capricious. However, the economic feasibility analysis results presented in DTR §31 are presented in an arbitrary manner that prevents the Regional Board from making a reasoned decision based on evidence fairly presented. Any Regional Board decision based solely or heavily on that unfair or biased presentation of evidence is arbitrary and capricious.

**Comment ID:** 51

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Appendix 31, Table A31-2

**Comment:**

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II.C.1. DTR Appendix 31 Table A31-2 groups the economic feasibility results together in an arbitrary manner.

The economic feasibility analysis evaluated the 66 polygons in eleven "cost scenarios," with each scenario representing a group of 6 polygons. See DTR Appendix 31. DTR Table A31-2 provided information relative to cost, such as total dredging area, total dredging volume, under pier area, and rock protection area for each polygon.

For each 6-polygon cost scenario, Table A31 -1 presented data for: (1) the resulting surface weighted average concentration of each pollutant following remediation of those polygons and (2) the cumulative percent exposure reduction for each pollutant.

The economic feasibility analysis averaged the cumulative exposure reduction for all five pollutants and calculated the percentage "exposure reduction per \$10 million spent" based on the average pollutant levels. DTR Table A31 -1. The DTR presents the data in a chart labeled Figure 31-1.

The graphic representation of the economic feasibility presented in DTR Figure 31-1 is arbitrary. Instead of graphing each of the eleven cost scenarios separately, the DTR grouped some of the scenarios together, presenting the data in the following way:

[ Coastkeeper/EHC Table 1. Description of DTR Figure 31-1 by Cost Scenarios and Polygons  
[See Exhibit B] ]

By grouping multiple groups of six polygons scenarios together in an inconsistent and arbitrary way, the economic feasibility analysis fails to present a fair representation of the data, making the analysis arbitrary.

**Comment ID:** 52

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Figure 31-1

**Comment:**

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II.C.2. DTR Figure 31-1 would have looked different if results had been presented for each of the eleven cost scenarios.

When the cost scenarios are arbitrarily grouped, they look like this:

[ Figure 31-1 Percent Exposure Reduction versus Remediation Dollars Spent ]

Each of the eleven cost scenarios graphed individually looks like this:

[ Coastkeeper/EHC Figure 1. Average Percent of Exposure Reduction Per \$10 Million, for Each Cost Scenario ]

**Comment ID:** 53

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Figure 31-1

**Comment:**

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II.C.3. The DTR incorrectly summarizes cumulative exposure reduction percentages per \$10 million spent.

The DTR states "exposure reduction drops below 7 percent per \$10 million after \$33 million, below 4 percent after \$45 million, and drops to zero at \$185 million." DTR § 32.7.1 at 32-40. This response is consistent with supporting calculations in "2010-07-27 Economic feasibility 07-27-10.ng.xls" (SAR384569).

But the Cleanup Team's own discovery response indicates that those numbers are incorrect and shows that the average exposure reduction per \$10 million is 10.8% after \$33 million, 8.7% after \$45 million, and at 5.5% at \$185 million. See Response to San Diego Coastkeeper and Environmental Health Coalition Economic Feasibility Question, attached as Exhibit D.

[ Cleanup Team Response at Page 6: ]

Likewise, the DTR states that "the total cost of the cleanup is estimated to be \$58 million and asserts that "cleaning up additional areas beyond the proposed remedial footprint would yield about 4 percent additional exposure reduction per \$10 million spent." DTR § 32.7.1 at 32-40. The Cleanup Team's own discovery response proves these statements to be incorrect, as the chart above illustrates that the cumulative exposure reduction per \$10 million for a \$69.4 million cleanup is actually 8.7%.

**Comment ID:** 54

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Appendix 31, Figure 31-1

**Comment:**

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II.C.4. The Economic Feasibility Was Not Determined on a Constituent-by-Constituent Basis.

The economic feasibility analysis fails to calculate or present the data on a pollutant-by-pollutant basis. But the law requires that economic feasibility be determined on a pollutant-by-pollutant basis. See CAL. CODE REGS. tit. 23 § 2550.4(c) (The Regional Board must determine technological and economic feasibility "to achieve the background value for that constituent and find that "the constituent will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded." (emphasis added)).

By averaging the pollutant reduction concentration for all five primary constituents of concern, the Cleanup Team and DTR have masked variability in pollutant exposure reduction for each of the pollutants. For example, when percent pollution exposure reduction is calculated for each pollutant individually, it becomes clear that cost scenario 7 (\$85.3 - \$101.6 million) results in more than 20% exposure reduction in mercury, a persistent bioaccumulating pollutant with significant health impacts.

Calculating and graphing the percent pollution exposure reduction per \$10 million spent for each pollutant, using the same methodology the Cleanup Team used in the DTR. The result looks like this:

[ Coastkeeper/EHC Figure 2. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant ]

**Comment ID:** 55

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Figure 31-1

**Comment:**

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II.C.5. The economic feasibility data was not presented in a scaled manner.

DTR Figure 31-1 presents the economic feasibility analysis in a bar graph with percentage pollutant reduction per \$10 million spent on the Y-axis, and remediation dollars spent on the X-axis. But by using a bar graph, readers cannot tell the true relationship of the data points to one another over a continuous basis (dollars spent). To fairly represent the data and to observe the trends of where significant pollution reduction occurs per dollar spent and where the pollution reduction per dollar spent decreases, the results must be graphed on a continuous X-axis. Once the data is plotted as a scatter graph on a continuous x-axis, we can truly see the percent reduction compared the remediation dollars spent.

[ Coastkeeper/EHC Figure 3. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant and in Continuous Dollars, with Background Marked. ]

**Comment ID:** 56

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, Figure 31-1, 32.7.1

**Comment:**

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II.D. The DTR's economic feasibility conclusions based on DTR Figure 31-1 are arbitrary and capricious.

DTR §32.7.1 concludes, based on DTR Figure 31-1:

The highest net benefit per remedial dollar spent occurs for the first \$33 million (18 polygons), based on the fact that initial exposure reduction is above 12 percent per \$10 million spent. Beyond \$33 million, however, exposure reduction drops consistently as the cost of remediation increases. Exposure reduction drops below 7 percent per \$10 million spent after \$33 million and below 4 percent after \$45 million. Based on these incremental costs versus incremental benefit comparisons, cleanup to background sediment quality levels is not economically feasible.

These conclusions are not supported by evidence in the record once the exposure reduction per \$10 million is analyzed and presented on a constituent-by-constituent basis. It is crucial that the exposure reduction data for each pollutant be graphed individually because the alternative cleanup levels must be set on a pollutant-by-pollutant basis, not as an average pollution reduction amount. See State Water Board Order 92-49. The alternative cleanup levels address each pollutant separately because each pollutant represents a different major class of pollutants that poses a specific type of harm or risk of harm to human health or the environment. See DTR at 20-1, 20-2.

If the economic feasibility results are examined on a continuous dollar basis and on a constituent-by-constituent basis, it becomes clear that selection of \$33 million as the point below which exposure reduction "drops consistently" as the remediation cost increases and conclusion that cleanup to background is economically infeasible is arbitrary and capricious.

[ Coastkeeper/EHC Figure 4. Percent Pollution Exposure Reduction Per \$10 million, by Pollutant and in Constant Dollars, with background and \$33 million marked. ]

**Comment ID:** 57

**Organization:** Coastkeeper and EHC

**DTR Section:** 32.7.1.

**Comment:**

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II.E. The Conclusion that The Alternative Cleanup Levels Are the Lowest Levels Economically Achievable is Arbitrary and Capricious and Not Supported by the Evidence.

The Order concludes that "the alternative cleanup levels established for the Shipyard Sediment Site are the lowest levels that are technologically and economically achievable." Order Finding 32 at 16. But this conclusion is based on the DTR's faulty analysis in § 32.7.1

regarding the four percent additional exposure reduction per additional \$10 million spent above \$58 million, which the Cleanup team's own discovery response has proven untrue. See above. Section 11.C.3.

Further, the DTR's conclusion that 4 percent additional average pollutant exposure reduction per \$10 million spent is not "economically achievable, is arbitrary. See DTR §32.7.1 at 32-40. Neither the Order nor the DTR explains why a 12% average exposure reduction per \$10 million is economically achievable, but 4% average exposure reduction per \$10 million is not. Nor has the Order or DTR explained why it is appropriate to look at average exposure reduction for all pollutants instead of analyzing economic feasibility on a pollutant-by-pollutant basis. If economic feasibility is analyzed for each pollutant, a cleanup of \$85 million provides an exposure reduction for HPAHs of approximately 12% per \$10 million, and a cleanup of \$101 million provides an exposure reduction for mercury over 20% per \$10 million spent. Determining that a \$58 million cleanup will bring pollutant levels to the "lowest levels economically achievable" based on a faulty claim that further cleanup will only reduce pollution by 4% per \$10 million spent is arbitrary and capricious when the evidence shows that additional cleanup will reduce HPAHs by 12% per \$10 million spent and reduce mercury by 20% per \$10 million spent.

**Comment ID:** 58

**Organization:** Coastkeeper and EHC

**DTR Section:** 31, 32.2

**Comment:**

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II.F. The Economic Feasibility Analysis Fails to Demonstrate that the Chosen Alternative Cleanup Levels Represent the "Best Water Quality" Based on All Demands.

The DTR states: "An assessment of risk to wildlife receptors under projected post-remedial conditions was conducted to confirm the alternative cleanup levels established by economic analysis (Section 31) are adequately protective of aquatic-dependent wildlife beneficial uses." DTR 532,2 at 32-12(emphasis added). In this statement, the DTR admits that the economic feasibility analysis in Section 31 determined the alternative cleanup levels. But there is no evidence in the record justifying the decision to limit the Proposed Remedial Footprint to 23 polygons.

State Water Board Order 92-49 requires the economic feasibility analysis to consider all the values involved, but the economic feasibility analysis only includes cleanup cost for the dischargers and measures that against average pollutant concentration removal per \$10 million spent. The analysis fails to quantify and consider additional benefits to human health, wildlife, aquatic dependent wildlife, and other beneficial uses from removing pollutants and providing a cleaner San Diego Bay for the wildlife and communities that use this resource. The analysis vaguely asserts that it "considered" a broad range of values, but none of these are listed or quantified, and there is no explanation of the role these other, external costs played in the determination of the economic feasibility of cleaning to background.

For example, the DTR claims that the "San Diego Water Board evaluated a number of criteria to determine risks, costs and benefits." DTR § 31 at 31-1. It suggests that these criteria included

factors such as "total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses..., effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial or industrial uses of aquatic resources." DTR § 31 at 31-1. But other than alleging that these factors were "evaluated," the DTR makes no attempt to quantify or rank these criteria or explain how they were balanced against one another.

**Comment ID:** 59

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

III. The Order Fails to Meet Legal Requirements for Cleanup to Pollutant Levels Greater Than Background.

In order to adopt alternative cleanup levels, the Regional Board must make a finding that the pollutants will not threaten human health or the environment as long as the alternative cleanup levels are "not exceeded"; CAL. CODE REGS. tit. 23 §2550.4(c). But the monitoring plans—both during and post-remediation—do not actually require that the alternative cleanup levels be met. See Order Directive A.2.a. and Directive D; DTR § 34.

**Comment ID:** 60

**Organization:** Coastkeeper and EHC

**DTR Section:** 32.2.3, Table A32-3

**Comment:**

III.A. The Site-Wide Alternative Cleanup Levels Were Calculated Based on Remediating to Background Pollutant Levels.

The DTR admits that "Post-remedial SWAC calculations were completed with the assumption that the SWAC inside the [Proposed Remedial] footprint would be remediated to background concentrations..." DTR §32.2.3 at 32-12; see also Table A32-3. By the DTR's own admission, in order to achieve the post-remedial pollutant concentrations site-wide, the remediated areas need to be cleaned to background if the other areas remain untouched. For this approach to be valid, the cleanup must ensure that remediated areas are cleaned to background conditions or cleaner.

**Comment ID:** 61

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.1

**Comment:**

III.B. The Remediation Monitoring Fails to Require Remedial Areas to Achieve Background Levels.

The Order and the DTR indicate that the Dischargers must conduct "Remedial Monitoring" to confirm that the dredging and other remedial activities have achieved target clean-up goals within the remedial footprint. See Order Section B.1. I: DTR Section 34.1. As explained above, the "target cleanup levels within the remedial footprint" is background pollutant levels. But the

Order and DTR set out a process by that allows the remediated areas to be 20% more polluted than background pollutant levels.

**Comment ID:** 62

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.1.2, Table A32-3

**Comment:**

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III.B.1. The "120% of background" could lead to site-wide pollutant concentrations above the Alternative Clean-up Levels.

The Order requires a second dredging pass: "if concentrations of primary COCs in subsurface sediments (deeper than 5 cm) are above 120 percent of post-remedial dredge area (background) concentrations." Order Directive A.2.a. at 20; see also DTR § 34.1.2. at 34-3.

Because the DTR's approach to achieve site-wide contamination levels below existing contamination levels (but above background) is to clean-up a portion of the Site to background levels and to leave other portions of the site as-is, it is key that those portions of the Site that will be dredged actually achieve background contamination levels. See MacDonald 2011 at 25. But the Order and DTR has set the trigger for second pass of dredging at 120% of background, meaning that the remediation areas will not necessarily achieve background contamination levels and are likely to have higher-than-background concentrations of pollutants. See MacDonald 2011 at 25.

When the "Predicted Post-Remedial SWAC Calculations" in DTR Table A32-3 are recalculated using numbers in each remediated polygon at the "120% of background" level at which additional dredging is not required, it becomes clear that the site-wide alternative cleanup levels will not be achieved. By substituting the background concentrations of each pollutant for the 120% of background, the resulting Site-wide surface weighted average concentration for each pollutant would be greater than the Alternative Cleanup Levels.

[ Coastkeeper/EHC Table 2. Comparison of Post-Remedial Pollutant Concentration When Remediated to Background and Second-Pass Dredging Trigger Set at 120% of Background [ See Exhibit H for Detailed Calculations using DTR Table A32-3. ] ]

The DTR and record present no evidence demonstrating that site-wide remediation goals will be met if the concentrations of pollutants in all of the remediated areas are at 120% of background levels. See MacDonald 2011 at 25. Therefore, the "120% of background" second-dredging pass rule is arbitrary and capricious and fails to ensure that alternative cleanup levels are achieved.

**Comment ID:** 63

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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III.B.2. The Regional Board cannot approve the Order and DTR with the 120% of background second-pass rule because it fails to ensure that Alternative Cleanup Levels will not be exceeded.



To allow an alternative cleanup level greater than background concentration of a pollutant, the Regional Board must find that the constituent will not pose a threat to human health or the environment "as long as the concentration limit greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c) (emphasis added). But the Order's own allowance for remediated polygons to have pollutant concentrations greater than background renders the Alternative Cleanup Levels "predicted resulting pollutant concentrations" and not actual pollutant concentration limits. To make the alternative cleanup levels concentration limits, the Order must ensure that remediated areas are remediated to background pollutant concentrations.

**Comment ID:** 64  
**DTR Section:** 34

**Organization:** Coastkeeper and EHC

**Comment:**

III.B.3. The "120% of background" decision rule violates the Order's corrective action directive.

Order Section A.2.C. states "the Shipyard Sediment Site as shown in Attachment 2 shall be remediated to attain the following post remedial surface-weighted average concentrations ("SWACs").

[ Table displaying Predicted Post-Remedial SWACS for Primary COCs ]

Because the Order mandates—through the use of the word "shall"—attainment of the above-listed post-remedial SWACs, and because those levels can only be guaranteed if the remedial areas achieve background pollutant levels, the 120% background Redredging trigger violates the Order's remediation directive.

**Comment ID:** 65  
**DTR Section:** 34

**Organization:** Coastkeeper and EHC

**Comment:**

III.B.4. The "120% of background" decision rule for a second dredging pass is ambiguous.

In addition to violating the requirement that the alternative cleanup levels must be concentration limits, the language in the Order setting the 120% background level allowance leaves open the possibility that every Contaminant of Concern had to exceed 120% of background in order to warrant a second dredging pass. See Order Directive A.2.a This would allow for a situation when one or more of the pollutants were significantly above background concentrations, but if one pollutant was at or below 120% of background, that no additional dredging would be required. This would lead to even more egregious violations of the alternative cleanup levels. See MacDonald 2011 at 25.

**Comment ID:** 66  
**DTR Section:** 34.2.

**Organization:** Coastkeeper and EHC

**Comment:**

III.C. The Post Remedial Monitoring Fails to Evaluate Whether Alternative Cleanup Levels are Achieved.

The Order requires the Dischargers to submit a Post Remedial Monitoring plan [ Footnote 4 - While the Order refers to "Post Remedial Monitoring," (pages 25-31, Attachment 6), the DTR refers to "Post-Remediation Monitoring" (see Section 34.2). These comments use the term "Post Remedial Monitoring" to refer to requirements in both the Order and DTR. ] to the San Diego Water Board within 90 days of the Order's adoption. See Order Section D; DTR §34.2. The Post Remedial Monitoring plan must be designed to verify that the remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. Post Remedial Monitoring is a key component of any sediment remediation because it provides the data and information needed to confirm that the remedial work has been successfully completed and to confirm that the clean-up goals have been met. See MacDonald 2011 at 28. Unfortunately, the Post Remedial Monitoring requirements set out in the Order and explained in the DTR do not provide data needed to evaluate the remedial measures' effectiveness and to identify whether additional remediation is needed to achieve the clean-up goals. The Post Remedial Monitoring also considers the remedy "successful" at pollutant concentrations greater than the alternative cleanup levels.

**Comment ID:** 68

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

III.C.1. The Order sets the "Remedial Goals" as compliance with "Trigger Concentrations" above the Alternative Cleanup Levels—and in some cases ABOVE existing pollutant levels.

The Order sets the "Remedial Goals" as "composite site-wide [pollutant concentrations] below the Trigger Concentrations." Order Directive D at 29. A quick glance at the Trigger Concentrations reveals that they are well above the "alternative cleanup levels" and in many cases are not much below existing pollutant levels. For mercury, the Trigger Concentration is actually greater than existing mercury levels. This means that the Order is setting a cleanup goal for mercury that the cleanup not add any additional mercury contamination. See MacDonald 2011 at 31.

[ Coastkeeper/EHC Table 3. Summary of Pollutant Concentrations ]

[ Table Note 5 - See Order Table 1 at 13. ]

[ Table Note 6 - See DTR Table 32-5 at 32-14. ]

[ Table Note 7 - See Order Table 2 at 15. ]

[ Table Note 8 - See Order D.6. at 27 ]

Because the Order sets the remediation goals as compliance with the "Trigger Concentration" instead of the alternative cleanup levels, the Order is actually setting the "Trigger Concentration" as the concentration limit for each pollutant.

In order for these "trigger concentrations" to be acceptable as alternative cleanup levels greater than background, the Regional Board must find that "the constituent will not pose a threat to human health or the environment as long as the concentration limit greater than background is not exceeded." CAL. CODE REGS. tit. 23 §2550.4(c).

The Regional Board cannot make this finding for two reasons. First, mercury has been identified as a toxic pollutant that poses a threat to human health and the environment when in its bioaccumulating methylmercury form. DTR § 1.5.2.5 at 1-16, 1-17. People from the local community who eat fish from San Diego Bay are at risk from existing mercury levels. See DTR § 1.5.3; see generally Environmental Health Coalition ^Survey of Fishers on Piers in San Diego Bay," March 2005. The Regional Board cannot find that allowing more mercury in the sediment in San Diego Bay does not pose a threat to human health and the environment. Second, the analysis in the DTR regarding the risk to beneficial uses is based on the "alternative cleanup levels" listed in Table 2 of the Order, not the "Trigger Concentrations" as the remedial goal. There is no analysis in the record that compliance with the "Trigger Concentrations" will not pose a threat to human health or the environment.

**Comment ID:** 69

**Organization:** Star & Crescent

**DTR Section:** 5

**Comment:**

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Star & Crescent Boat Company is Not a Successor to San Diego Marine Construction Company

(See TCAO Paragraph 5, "Accordingly, Star & Crescent is the corporate successor of and responsible for the conditions of pollution or nuisance caused or permitted by San Diego Marine Construction Company.")

(See DTR Finding 5, "Accordingly, Star & Crescent is the corporate successor of and responsible for the conditions of pollution or nuisance caused or permitted by San Diego Marine Construction Company".)

The Water Board does not allege and cannot prove that S&C Boat engaged in any direct activity at, or related to, the Shipyard Sediment Site. The only basis for the Water Board's assertion of liability against S&C Boat is based upon a flawed corporate successor liability theory. S&C Boat has no successor liability for SDMCC or Investment Co., the entity from which S&C Boat acquired only harbor excursion assets and liabilities four years after SDMCC/Investment Co. gave up all leasehold interest in the Shipyard Sediment Site.

Moreover, S&C Boat did not assume all of SDMCC/Investment Co.'s liabilities when it acquired the harbor excursion business. The acquisition of the harbor excursion business did not result in a mere continuation or de facto merger between S&C Boat and SDMCC/Investment Co. because the two companies were owned and operated separately: Investment Co. continued to own and operate several other businesses and own real property until 1991, while S&C Boat separately operated the harbor excursion business. S&C Boat acquired this harbor excursion business for adequate consideration. Finally, there is no evidence that S&C Boat's acquisition of the harbor

excursion business was part of a fraudulent transfer. Thus, S&C Boat does not have successor liability for SDMCC or Investment Co.

The Water Board has identified no other fact or theories of liability aside from the successor-in-interest theory, which is herein shown to be inappropriate and without merit. As a result, there is no basis upon which the Water Board can assign liability to S&C Boat.

The TCAO must be amended to remove reference to S&C Boat as a responsible party or “discharger.” S&C Boat is a distinct corporate entity that does not bear legal responsibility for the contamination allegedly caused or permitted by SDMCC at the Shipyard Sediment Site.

**Comment ID:** 70

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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III.C.2. The Post Remedial Monitoring program will mask ongoing pollutant problems.

The Post Remedial Monitoring program requires Dischargers to collect a paltry amount of samples and then mix them together—a process called "compositing"—which will mask the true extent of the remaining pollution and to guarantee that no additional action will be required. See MacDonald 2011 at 30. In order to fairly assess the success of the remediation and determine if additional remediation is necessary, the Post Remedial Monitoring program must collect a robust amount of samples and analyze those samples in a meaningful way. Given the current design of the program, the Regional Board will not be able to assess whether the alternative cleanup levels were achieved and the remediation was successful.

**Comment ID:** 71

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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III.C.2.a. The Post Remedial Monitoring program fails to require samples from each polygon at the site.

The sediment sampling requirements described in the Order will provide data on the average levels of five pollutants in the top 2 cm of sediment contained within only six polygon groups. See Order, Section D.1.c. This means that the Order fails to require the Dischargers to collect data needed to evaluate whether the clean-up goals have been met for the whole site. See MacDonald 2011 at 29. Determining pollutant concentrations within each polygon at the Site is important because certain ecological receptors—including benthic invertebrates and certain benthic fish species, such as gobies—have small home ranges and are therefore exposed to contaminants that occur within small geographic areas. See MacDonald 2011 at 29.

Further, this method is not consistent with the way the site-wide post-remedial concentrations were determined. Those site-wide concentrations were determined by measuring existing

pollutant concentrations in each unremediated polygon, assuming that each remediated polygon would be cleaned to background, and then calculating the average. To determine the actual post-remedial pollutant concentrations, the pollutant concentrations in each polygon should be measured and the concentrations should then be averaged. This way, if the site-wide alternative cleanup levels are not met and additional action is needed, the data will be available to determine where the pollutant "hot-spots" are or which remediated polygons were not remediated to background. This will also indicate if the dredging resuspended contaminated sediments and potentially contaminated areas outside the remedial footprint.

**Comment ID:** 72

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.2.1.

**Comment:**

III.C.2.b. Compositing surface sediment into six polygon groups will mask the true extent of contamination remaining at the Shipyard Sediment Site.

The DTR divides the Shipyard Sediment Site into six sampling areas and then directs the Dischargers to use a compositing scheme to evaluate the efficacy of the remediation. This process is flawed for several reasons:

- (1) The "success" of the clean-up will rely heavily on data from polygons that were not dredged. Only two of the six groups sampled to determine the remediation's success represent areas where remedial actions will be taking place, and these areas represent a relatively small proportion of the site as a whole. Therefore, the assessment of how successful the cleanup has been will largely rest on composite data from sites that were not remediated — an inappropriate basis for evaluating the efficacy of remedial actions. See MacDonald 2011 at 30.
- (2) The six sampling areas are arbitrary. Neither the Order nor the DTR provide any explanation of how the six sampling areas were selected, nor do the documents describe how this is a scientifically-defensible method to assess remediation success. Composite sediment sampling to determine a remediation program's success is unorthodox. See MacDonald 2011 at 30. Without a detailed, scientifically-based explanation of how the sites were selected and how it would accurately gauge remediation success, this sampling method is not scientifically justified and is arbitrary. See MacDonald 2011 at 30.
- (3) Testing replicate sub-samples of composited sediment samples tests how good the lab is, not the variability of pollutants remaining at the Site. The Post Remedial Monitoring plan will not provide the data to verify whether the remediation has been effective in protecting human health and aquatic-dependent wildlife. See DTR § 34.2.1; MacDonald 2011 at 30. The plan's reliance on sub-sampling sediments that have been composited from multiple polygons will only provide information on the consistency of the homogenization process that is applied to the composite sediment samples. See MacDonald 2011 at 30. The sub-sampling approach will not provide Regional Board staff with the information necessary to determine whether remediation has been effective at protecting human health or aquatic-dependent

wildlife. See MacDonald 2011 at 30.

**Comment ID:** 73

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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III.C.3. Failure to assure that the Alternative Cleanup Levels are met through the remediation process renders the cleanup illegal.

The Post Remedial Monitoring requirements reveal the major shortcomings of the cleanup.

(1) There is no requirement in the Order that the alternative cleanup levels must be met. Instead, the Order allows the cleanup to achieve a less-stringent "Trigger Concentration" level of pollutant that effectively sets the cleanup levels significantly higher than background pollutant levels. See Order at D.6 at 27. But there is no evidence in the record that this remaining pollutant level will not "pose significant risk to human health or the environment" or will not Unreasonably affect present and anticipated beneficial uses of the waterbody." See State Water Board Order 92-49.

(2) By considering the remediation successful if it achieves "Trigger Concentration" levels, the cleanup is not "consistent with the maximum benefit to the people of the state." The people of the state have paid for Regional Board staff to spend years' worth of time developing a cleanup plan. To settle for a plan that allows an even greater level of pollution than already exists and calling it "successful" is an insult to the people of California.

(3) By designing the Post Remedial Monitoring to disguise the true extent of pollution remaining at the Site and to gauge the success of the remediation overwhelmingly on pollutant levels in areas that were not actually remediated makes the cleanup look like a sham. To demonstrate that the Dischargers and the people of the California that the cleanup achieved the alternative cleanup levels, the Post Remedial Monitoring must be designed in a way to fairly assess the cleanup's success and identify areas where cleanup was not successful.

(4) Exceeding the "Trigger Concentrations" does not actually trigger any additional remediation. See MacDonald 2011 at 34. Instead, Dischargers need only attempt to identify the specific sub-areas that are causing the exceedance(s), and write a report of investigation that includes recommendation action—if any—to address the problem. This means that even where pollutant concentrations exceed the alternative clean-up levels and the trigger concentrations, there is still no mandate to take additional remedial action to achieve the alternative clean-up levels.

**Comment ID:** 74

**Organization:** Coastkeeper and EHC

**DTR Section:** 32

**Comment:**

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IV. The Proposed Cleanup Fails to Require the Best Water Quality Reasonable.

The law requires every cleanup to result in the "best water quality reasonable." See State Water Board Order 92-49. The following aspects of the proposed cleanup prevent it from achieving the "best water quality reasonable."

**Comment ID:** 75

**Organization:** Coastkeeper and EHC

**DTR Section:** 32

**Comment:**

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IV.A. Narrative Alternative Cleanup Levels for Aquatic Life Cannot Ensure that These Beneficial Uses will not be Unreasonably Affected at the Shipyard Sediment Site.

The Order and DTR fail to include numeric clean-up levels for benthic invertebrates and fish. See MacDonald 2011 at 18-20. Instead the Order relies on a narrative directive to protect aquatic life. See Order, Table 2 at 15 ("Remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community."). This failure is particularly egregious with respect to fish, as no information was presented in the Order or the DTR on how the potential for adverse effects on fish were explicitly considered. See MacDonald 2011 at 18 and 20. Furthermore, the lines of evidence developed to assess benthic invertebrate communities are likely to be minimally protective as they rely on comparisons to a reference pool that included samples that would not meet criteria for negative control samples. See MacDonald 2011 at 19. Without appropriate numeric limits for fish and benthic invertebrates, there will be no way to quantitatively measure compliance with measures to protect fish and benthic invertebrates.

**Comment ID:** 76

**Organization:** Coastkeeper and EHC

**DTR Section:** 38

**Comment:**

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IV.B. The Proposed Remedial Footprint is Too Small to Ensure that the Remaining Pollutant Levels will not Unreasonably Affect Present and Anticipated Beneficial Uses of San Diego Bay.

The Proposed Remedial Footprint indicating "polygons targeted for remediation" is too small to ensure that present and anticipated beneficial uses of San Diego Bay are protected. See Order at 38, Attachment 2.

**Comment ID:** 77

**Organization:** Coastkeeper and EHC

**DTR Section:** 32.5.2., Table 32-19

**Comment:**

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IV.B.1. Problems with the development of the Proposed Remedial Footprint results in a cleanup that achieves less than the best water quality reasonable.

First, an insufficient number of samples were collected to accurately determine the nature and extent of contamination at the 148-acre Shipyard Site, given the variability of contaminants at the site. See MacDonald 2011 at 10.

Second, ranking the polygons from most- to least-contaminated using the Composite Surface Weighted Average Concentration (SWAC) Value fails to consider the potential adverse effects on human health or the environment. See MacDonald 2011 at 10. The method also ignores concentrations of other contaminants—such as lead, zinc, and low molecular weight PAHs—that could be elevated in sediments from the site. See MacDonald 2011 at 10.

Third, the Proposed Remedial Footprint arbitrarily excludes 15 polygons that are more contaminated—from a sediment chemistry standpoint—than the least-contaminated polygon in the Proposed Remedial Footprint. See MacDonald 2011 at 11.

Fourth, the thresholds the DTR uses to determining whether polygons that are "Likely" impacted are problematic. The DTR fails to explain why the Site Specific Median Effects Quotient (SS-MEQ) is used to evaluate sediment chemistry in the non-Triad sediment samples, when the metric used for the Triad sediment samples (SQGQI) is reliable. See MacDonald 2011 at 19. The DTR and record provide no evidence demonstrating how or why 0.9 was chosen as the "optimal threshold." DTR § 32.5.2 at 32-32; See MacDonald 2011 at 11. Likewise, the 60% Lowest Apparent Effects Threshold for classifying sediment samples as "Likely" impacted is too high. See MacDonald 2011 at 11-13; See DTR § 32 at Table 32-19.

Additionally, the DTR failed to explicitly consider the potential effects exposure to contaminated sediments would have on fish with small home ranges. This failure is problematic because fish with small home ranges are known to utilize benthic habitats at the Site and the concentrations of PCBs in sediments are sufficient to adversely affect the reproduction offish at various locations. See MacDonald 2011 at 15.

**Comment ID:** 78  
**DTR Section:** 33.

**Organization:** Coastkeeper and EHC

**Comment:**

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IV.B.2. The Proposed Remedial Footprint excludes eight polygons that, under the DTRs own methodology, should have been included.

Polygons NA22, NA01, NA04, NA07, NA16, SW06, SW18, and SW29 should have been included in the Proposed Remedial Footprint and should be added to the final remedial footprint.

**Comment ID:** 79  
**DTR Section:** 33.

**Organization:** Coastkeeper and EHC

**Comment:**

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IV.B.2.a. The Proposed Remedial Footprint improperly excludes NA22.

The DTR acknowledges that polygon NA22 is "Likely" impaired and should be remediated because Contaminants of Concerns in sediments are likely adversely affecting benthic invertebrates within this polygon. See DTR Section 33.1.1. However, NA22 has improperly been excluded from the Proposed Remedial Footprint, principally because NA22 is in the vicinity of a



Total Maximum Daily Load being prepared for the Mouth of Chollas, Switzer, Paleta Creeks ("Creek Mouth TMDL").

The Creek Mouth TMDL will not address the existing contamination in polygon NA22. TMDLs "function primarily as planning devices and are not self-executing." See *City of Arcadia v. EPA*, 265 F.Supp.2d 1142, 1144 -1145 (N.D. Cal. 2003), citing *Pronsolino v. Nastro*, 291 F.3d 1123, 1129 (9th Cir.2002) ("TMDLs are primarily informational tools that allow the states to proceed from the identification of waters requiring additional planning to the required plans.").

A TMDL does not, by itself, prohibit any conduct or require any actions. See *id.* A TMDL merely "forms the basis for further administrative actions that may require or prohibit conduct with respect to particularized pollutant discharges and waterbodies." See *id.* (emphasis added), citing *Idaho Sportsmen's Coalition v. Browner*, 951 F. Supp. 962, 966 (W.D.Wash.1996)(4TMDL development in itself does not reduce pollution.... TMDLs inform the design and implementation of pollution control measures.").

The TMDL process cannot provide a vehicle for remediating contaminated sediment within the NA22 polygon. A new and separate remediation process—another Cleanup and Abatement Order—would need to be initiated after completion of the Creek Mouth TMDL to address existing contaminated sediment in NA22, if it is not remediated under the current Order. When asked in depositions, no Cleanup Team member could point to a TMDL that had been implemented through dredging. This means that removing NA22 from the Proposed Remedial Footprint virtually guarantees that it will never be dredged—even though the DTR agrees that it is "Likely" impaired. Furthermore, TMDLs are given a long time period—typically twenty years—before they need to be implemented. Adding this delay together with the time it would take to develop another cleanup and abatement order to address NA22 means that any possible cleanup of NA22 would not be for decades down the road. It is a waste of time and resources to put off remediating NA22 when a framework for its remediation has already been established in this process.

**Comment ID:** 80

**Organization:** Coastkeeper and EHC

**DTR Section:** 33, Table A33-1, Table A33-3

**Comment:**

IV.B.2.b. The Proposed Remedial Footprint excludes—NA01, NA04, NA07, NA16, SW06, SW18 and SW29—which pose unacceptable risks to fish and the benthic community.

The DTR arbitrarily excluded at least a dozen polygons from the Proposed Remedial Footprint without explanation. See MacDonald 2011 at 14-15. An independent evaluation of the available data and information by sediment remediation expert Donald MacDonald indicates that seven of these excluded polygons pose risks to organisms utilizing habitats within the study area. (MacDonald 2009). The following presents the results of an evaluation for seven polygons that should be added to the Remedial Footprint to address inconsistencies in the procedures applied in the DTR and the risks posed to fish and benthic organisms. See MacDonald 2011 at 39, Table 5.

[ MacDonald 2011 at 39, Table 5 ]

**Comment ID:** 81

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.1.

**Comment:**

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IV.C. The Remediation Monitoring is Insufficient to Assess Remedial Activities' Impacts on Water Quality, to Evaluate the Effectiveness of Remedial Measures, or to Identify the Need for Further Dredging to Achieve Clean-up Goals at the Shipyard Sediment Site.

The Order and the DTR indicate that the Dischargers must conduct water quality monitoring: (1) to demonstrate that remedial dredging does not violate water quality standards outside the construction area and (2) to confirm that the dredging and other remedial activities have achieve target clean-up goals within the remedial footprint. See Order Section B.1. 1; DTR Section 34.1. Unfortunately, the water quality component of the Remediation Monitoring program set out in the Order and the DTR falls short of meeting the monitoring goals for several reasons.

**Comment ID:** 82

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.1.1.

**Comment:**

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IV.C.1. The water quality component of the Remediation Monitoring program fails to provide safeguards to ensure data collected reveals actual water quality conditions.

The water quality component of the Remediation Monitoring Program falls short in two ways: (1) some of the requirements are specific but are not designed to collect data to accurately reflect water quality impacts during remediation and (2) some requirements are vague, allowing Dischargers to collect data in a way that masks the true water quality impacts during dredging.

For example, the Remediation Monitoring program allows the Dischargers to measure compliance with ambiguous water quality monitoring goals through modeling, which will not provide data of actual conditions sufficient to determine whether dredging is violating water quality standards. See MacDonald 2011 at 22; DTR § 34.1.1. at 34-2. Water quality impacts can only be adequately assessed by comparing the results of real-time turbidity monitoring, dissolved oxygen sampling, and sampling of contaminants of concern to water quality standards in the Basin Plan and/or state water quality standards. See MacDonald 2011 at 22. Similarly, the Remediation Monitoring allows Dischargers to abandon daily water quality monitoring if no samples exceed water quality targets for three days in a row. DTR § 34.1.1. at 34-2. Abandoning daily monitoring is problematic because variability in turbidity or dissolved oxygen levels may not be associated primarily with operation of the dredge. See MacDonald 2011 at 23.

Vagueness in the Remediation Monitoring requirements include: (1) failing to specify the numeric "water quality standards" that must be complied with during remediation. See MacDonald 2011 at 22; (2) failing to require dischargers to take all the samples from downcurrent

locations. See MacDonald 2011 at 22; (3) failing to define the "construction area" See MacDonald 2011 at 22-23; (4) mandating that samples be collected 10 feet deep instead of the depth with the highest level of monitored variables. See MacDonald 2011 at 23; (5) failing to require that water samples need to be collected long enough after dredging commences to give the plume time to reach the sampling location; See MacDonald 2011 at 23, (6) and failing to specify which best management practices should be employed to reduce or eliminate resuspended sediments from traveling to other areas, harming water quality or recontaminating adjacent areas. See MacDonald 2011 at 23; DTR § 34.1.1. at 34-2.

**Comment ID:** 83  
**DTR Section:** 16

**Organization:** SDG&E

**Comment:**

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1.0 DTR's Benthic Beneficial Use Impairment is Critically Flawed and Should be Replaced with a Causal Approach to Adequately Identify Risk

1.1 Introduction

CRWQCB evaluated impairment of Aquatic Life Beneficial Uses for Estuarine Habitat, Marine Habitat, and Migration of Aquatic Organisms by evaluating exposure and adverse effects to the benthic macroinvertebrate community and fish (Findings 14-15 in CRWQCB, 2010) using data from the 2001-2002 Site investigation by Exponent (2003). Adverse effects to fish from Site chemicals were not identified (Appendix for Finding 15 of CRWQCB, 2010). Adverse effects to the benthic macroinvertebrate community were evaluated by CRWQCB (2010) at each of the 66 sediment stations using one of two approaches, depending on the data collected at each of 66 sampling stations at the Site:

1. Triad Approach: The Triad Approach was based on a CRWQCB-derived Sediment Quality Triad approach (Findings 16 and 18 in CRWQCB, 2010) that integrated three lines of evidence: 1) concentrations of chemicals in Site surface sediment; 2) effects observed in laboratory toxicity tests conducted with Site surface sediment; and 3) enumeration of benthic macroinvertebrates collected from Site surface sediment. This approach was used to evaluate the likelihood of sediment chemical-derived effects on the benthic macroinvertebrate community at the 30 stations where data was collected for each of the three Triad lines of evidence. Six of the 30 Triad stations were classified as "Likely" for chemically-associated impairment (NA19, NA22, SW04, SW13, SW22, and SW23). A Triad Approach conclusion of "Likely" was equated with impairment of the benthic macroinvertebrate community at a level CRWQCB (2010) assumed to represent Aquatic Life BUI. The Triad approach did not provide evidence regarding the specific chemicals responsible for the BUI. Such an analysis would be problematic because TBT, a primary Site chemical of concern, was not included in the chemical screening step in this analysis.

2. Non-Triad Data Approach: The Non-Triad Data Approach was based on a CRWQCB-derived empirical approach (Finding 32 in CRWQCB, 2010) that used average quotients calculated from on dividing concentrations of PCBs (sum of 40 congeners), HPAHs, copper, mercury, and TBT by empirically derived median values (SS-MEQ), as well as comparison of single values to 60%

of the Lowest Adverse Effect Thresholds (LAETs) in Site surface sediment to predict the likelihood of sediment chemical-derived effects on the benthic macroinvertebrate community at the 36 stations for which only surface sediment chemistry was available. It should be noted that this

analysis was used as a substitute for a full Sediment Quality Triad evaluation because sediment toxicity and benthic macroinvertebrate community census data were not collected at the Non-Triad stations. Seven of the 36 Non-Triad stations were classified as “Likely” for chemically-associated impairment (SW01, SW05, SW10, SW16, SW20, SW24, and SW28). A Non-Triad Data Approach conclusion of “Likely” for a station was equated with impairment of the benthic macroinvertebrate community at a level CRWQCB (2010) assumed to represent Aquatic Life BUI. SW01, SW05, SW16, and SW20 were identified based on an exceedance of the SS-MEQ threshold, for which

chemical causality cannot be identified. SW10, SW24, and SW28 were identified based on an exceedance of 60% of the LAET value for HPAHs (and exceedance of SS-MEQ threshold), which suggests HPAHs may factor strongly in the BUI at these locations.

The sediment chemistry line of evidence approaches used in the CRWQCB (2010) do not represent a complete or accurate characterization of chemical risk potential to benthic invertebrates because they do not include all COCs and they are not based on cause-and-effect toxicity endpoints, as discussed by Conder (2011a). As a result, the current Triad and Non-Triad Data approaches set forth in the DTR are not scientifically valid or supportable, and should not be used to identify Aquatic Life Beneficial Use Impairment (BUI).

**Comment ID:** 84

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.1.2.

**Comment:**

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IV.C.2. The sediment component of the Remediation Monitoring program fails to require data collection to confirm Cleanup Levels are achieved.

In addition to the fatal flaw of only requiring a second dredging pass if pollutant concentrations exceed 120% of background pollutant levels, the sediment portion of the Remediation Monitoring program fails to require Dischargers to collect data in an amount and through methods sufficient to competently measure compliance with the alternative clean-up levels.

First, the Order and DTR provide inconsistent sampling requirements; the Order requires that samples be collected deeper than the upper 5cm. while the DTR requires that samples be collected deeper than the upper 10cm. See Order Directive A.2.a; DTR § 34.1.2 at 34-2. Second, vagueness in the monitoring requirements permits Dischargers to collect only one sample from each polygon, which is insufficient given the sediment chemistry variability within polygons. See MacDonald 2011 at 24. Vagueness in the monitoring requirements also allows sediment sampling to target the historic sampling locations, leaving other locations within the remedial footprint unsampled and ignoring elevated contaminant levels that may occur in those unsampled areas. See MacDonald 2011 at 25.

The DTR explains a sampling protocol that requires the sampling team to visually examine each sediment sample and try to identify Undisturbed sediments." These sampling procedures are inappropriate and will be nearly impossible for sampling teams to follow consistently. See MacDonald 2011 at 25. The DTR explains that a sand cap would be necessary at times, but the Remediation Monitoring fails to explain what those criteria are and who would make such determination. See MacDonald 2011 at 26. The Order is silent on this issue.

**Comment ID:** 86

**Organization:** Coastkeeper and EHC

**DTR Section:** 34.2.

**Comment:**

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IV.D. The Post Remedial Monitoring Program is Poorly Designed and Will not Require Data Collection to Accurately Evaluate Post-Remediation Conditions.

The Post Remedial Monitoring plan provides poorly-written and confusing directions that would be difficult for sampling teams to consistently follow. See MacDonald 2011 at 30. The Post Remedial Monitoring excludes NA22 wholesale from the Post Remedial Monitoring plan, even though NA22 is part of the Site. See DTR §34. NA22 must be included in any Post Remedial Monitoring because it is a part of the Shipyard Sediment Site. See MacDonald 2011 at 30.

The approach to evaluating post-remedial conditions is likely to underestimate sediment toxicity because the DTR relied on inappropriate thresholds. See MacDonald 2011 at 29. A better approach would be to generate sediment quality Triad data for at least six reference sites as part of the Post Remedial Monitoring plan. See MacDonald 2011 at 29.

Furthermore, requiring sediment samples to be collected at only five sampling stations to evaluate benthic community conditions is inadequate because it will provide data on only about eight percent of the polygons at the Sediment Shipyard Site instead of from the entire Site, which is more appropriate. See MacDonald 2011 at 31. As there is substantial potential for resuspension, transport, and deposition of fine sediment during the implementation of the remedy, recontamination of remediated areas or further contamination of unremediated areas could occur. See MacDonald 2011 at 31. The Post Remedial Monitoring plan should be expanded to provide a more robust basis for evaluating exposure of benthic invertebrates to contaminants at the site and for assessing sediment toxicity, and include testing from appropriate reference sites. See MacDonald 2011 at 31.

The Post Remedial Monitoring program's bioaccumulation requirements are insufficient. The nine sites selected for Post Remedial bioaccumulation sampling are arbitrary. See MacDonald 2011 at 31. Because the bioaccumulation criteria are not effects-based, they will not be useful for determining if conditions at the Shipyard Sediment Site will be unreasonably affecting San Diego Bay beneficial uses two years, five years, or ten years after the completion of remedial actions. See MacDonald 2011 at 31. Moreover, reducing bioaccumulation levels below the pre-remedial levels would not ensure that aquatic organisms utilizing habitats at the site would have tissue concentrations of contaminants of concern low enough to support beneficial uses. See MacDonald 2011 at 29.

The Order fails to include rules specifying what actions the Dischargers must take in several situations, including (1) if sediment chemistry results for the post-remediation sediment samples exceed the thresholds included in the Order and (2) if toxicity to one or more species is observed during the Post Remedial sampling and testing. See MacDonald 2011 at 32. The Order does not list the triggers that will be used for evaluating sediment chemistry for benthic exposure. See MacDonald 2011 at 32.

**Comment ID:** 90  
**DTR Section:** 33.3  
**Comment:**

**Organization:** Coastkeeper and EHC

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IV.E. The DTR Contains Incorrect Statements.

The DTR incorrectly claims that the Proposed Remedial Footprint "captures 100 percent of triad 'Likely'... impacted stations." DTR § 33.3.at 33-12. This claim is incorrect because the Proposed Remedial Footprint excludes NA22, which the DTR analysis determined was "likely" that "the health of the benthic community is adversely impacted based on three lines of evidence: sediment chemistry, toxicity, and benthic community." See DTR Table 18-1 at 18-2.

The DTR repeatedly refers to "65" polygons, even though there are a total of 66 polygons in the Shipyard Sediment Site. See DTR § 31.1 at 31-2; § 32.2 at 32-9; 32-11; §32.5 at 32-28; §34.2.1 at 34-5. The economic feasibility documentation in Appendix 31, Table A31-2 and "2010-07-27 Economic feasibility 07-27-IO.ng.xls" (SAR384569) reveal that all 66 polygons were ranked in the economic feasibility analysis. Similarly, Appendix 32, Tables A32-1 and A32-3 and supporting data and calculations in "01-Final pre-remedial SWAC 8-17-10.XLS" (SAR384570) and "02-Final post-remedial SWAC\_1.xls" (SAR384571) show all 66 polygons were included in calculating the pre-remedial SWACs and post-remedial SWACs. The DTR cannot pretend that NA22 no longer exists or is no longer part of the Shipyard Sediment Site just because the Cleanup Team chose not to include it in the Proposed Remedial Footprint in the hope that someday another process might address contamination in that polygon.

**Comment ID:** 95  
**DTR Section:** 31  
**Comment:**

**Organization:** SDG&E

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2.0 DTR's Section 31 Economic Feasibility Analysis Fails to Consider Costs to Reduction in Benthic Risk Exposure and Should be Revised

**Comment ID:** 96  
**DTR Section:** 31  
**Comment:**

**Organization:** SDG&E

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2.0  
2.1 Introduction

Economic feasibility refers to the objective balancing of the incremental benefit of attaining more stringent cleanup levels compared with the incremental cost of achieving those levels. The CRWQCB (2010) is required by Resolution No. 92-49 (SWRCB, 1996) to evaluate economic feasibility such that the benefits of remediation in addressing the Site's BUIs are fully understood. The CRWQCB (2010) evaluated the benefits of remediation as the reduction in chemical exposure to human and aquatic-dependent wildlife receptors using surface-area weighted average concentrations (SWAC) of Site COCs. While this approach satisfies Resolution No. 92-49 with respect to Human Health and Aquatic-dependent Wildlife BUIs, it does not address Aquatic Life BUI.

Figure 31-1 of CRWQCB (2010) represents the final product of an economic feasibility analysis conducted to compare the incremental reduction in chemical exposure (y-axis of figure) to incremental remedial costs (x-axis of figure). In this figure, as explained on Page 31-2, exposure reduction is calculated on the basis of SWACs for the various remedial increments. The proposed remedial footprint set forth in Section 33 of the DTR was explicitly derived to address all three potential Site BUIs. SWACs were used to evaluate only two of the three BUIs found at the Site: Human Health and Aquatic-dependent Wildlife (Section 32.2 in CRWQCB (2010)). Aquatic Life BUI was evaluated on the basis of Triad and Non-Triad Data Approaches, not SWACs (Section 32.5 in CRWQCB (2010)). Although Page 31-2 states that "[t]his process used Triad data and site-specific median effects quotient (SS-MEQ)" (in reference to the economic feasibility analysis), the metric used to evaluate remedial success (exposure reduction) does not include a quantification of the exposure reduction gained from remediating polygons exhibiting Aquatic Life BUI. The areas of the polygons affected by aquatic life BUI are not included in the calculation of exposure reduction, as shown on Page 31-2 and in the Appendix 31 supporting material. The economic feasibility analysis by Spadaro et al. (2011, Table 15 therein) is also flawed because it only considers SWACs, which do not account for Aquatic Life BUI.

**Comment ID:** 97

**Organization:** SDG&E

**DTR Section:** 31

**Comment:**

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2.0

2.2 Revised Economic Feasibility Analysis

Because the CRWQCB is charged with addressing all three BUIs, and any supporting economic feasibility analysis, it is imperative to evaluate economic feasibility on the basis of all three BUIs. A revised economic feasibility analysis is shown in Figure 2, based on calculations shown in Tables 20 and 21. In this revised economic feasibility analysis, the percent exposure reduction for all three BUIs is considered via calculation of a composite percent exposure reduction based on SWACs for aquatic-dependent wildlife and human health (as in CRWQCB (2011)) and the area exhibiting aquatic life BUI, as based on a Toxic Unit approach for the sediment chemistry line of evidence (Figure 3; Conder, 2011a). The Toxic Unit approach is a causal chemical exposure modeling to account for bioavailability of chemicals to benthic invertebrates and predict potential chemical risk. It was used as a replacement approach for the flawed SQGQ1 approach used in the CRWQCB (2010) Triad sediment chemistry line of evidence in order to re-classify Triad stations. It was also used as a replacement approach for the flawed SS-MEQ and

60% of the LAET calculations used in the Non-Triad Data Approach. Both the revised Triad and Non-Triad Data approaches were used to identify polygons for Aquatic Life BUI (Figure 3).

Economic feasibility was also calculated using a footprint designated to address Aquatic Life BUI only (Figure 4). The approach ranked polygons exhibiting Aquatic Life BUI by the highest Toxic Unit result multiplied by the area of the polygon (Table 22). Remedial cost was estimated for five increments according to approximate cost rates suggested by Table A31-1 (Table 23). This approach is more technically defensible because Aquatic Life BUI is the most likely BUI exhibited at the Site and modeling of human health and ecological risk to aquatic-dependent wildlife is flawed.

**Comment ID:** 98

**Organization:** SDG&E

**DTR Section:** 31

**Comment:**

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2.0

2.3 Conclusion

A revised economic feasibility approach should be adopted by CRWQCB to enable a complete and accurate evaluation of economic feasibility for any proposed remedial footprint for the protection of BUIs at the Site.

**Comment ID:** 99

**Organization:** SDG&E

**DTR Section:** 28

**Comment:**

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3.0 DTR's Assessment of Human Health Beneficial Use Impairment Fails to Follow Proscribed Regulatory Guidance and Should be Rejected

3.1 Introduction

Human health BUI considerations as a remedial action driver should be withdrawn by the CRWQCB because there is a complete lack of evidence for human health risk at the Site as well as a failure by the CRWQCB to follow established state and federal guidelines for the assessment of human health risk at impacted sites. Critical deficiencies in the DTR's human health risk assessment include: (1) the assumption of a value of "1" for the Fractional Intake parameter (Page 28-5, Table 28-3 and Page 28-6, Table 28-4 in CRWQCB (2010) for angler exposure at the Site (i.e., a complete exposure pathway); and (2) the failure of the CRWQCB to properly apply site-specific exposure parameters in concluding there is a risk to human health at the Site.

**Comment ID:** 105

**Organization:** SDG&E

**DTR Section:** 24

**Comment:**

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#### 4.0 DTR's Assessment of Aquatic Dependent Wildlife Beneficial Use Impairment Fails to Follow Proscribed Regulatory Guidance and Should be Rejected

##### 4.1 Introduction

CRWQCB (2010) addressed Aquatic-dependent wildlife beneficial uses Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), and Rare, Threatened, or Endangered Species (RARE) using ecological risk assessment to predict the likelihood of chemical effects in wildlife from exposure to chemicals originating from Site sediment. The CRWQCB (2010) analysis is based on modeling which predicts the exposure and effects to hypothetical wildlife species (Page 24-9 to 24-12 in CRWQCB (2010)). The model uses Site specific data such as concentrations of chemicals in sediment and prey items (e.g., fish, invertebrates) and specific-specific parameters (e.g., body weight, prey consumption rate). In cases where the model predicted potential risk for a particular chemical, the CRWQCB (2010) assumed Aquatic-dependent wildlife BUI was likely and identified that chemical as a COC. Primary COCs PCBs, HPAH, copper, and mercury were associated with Aquatic-dependent wildlife BUI and included in Spatially-Weighted Average Concentration (SWAC) calculations to derive a remedial footprint designed to address the presumed BUI.

##### 4.2 DTR Ecological Risk Assessment Flawed and Should be Revised

Aquatic dependent wildlife BUI considerations set forth in the DTR should be withdrawn by CRWQCB, because there is an absence of any site-specific evidence for aquatic dependent wildlife risk at the Site. The critical flaw in the DTR's ecological risk assessment modeling is the assumption that aquatic dependent wildlife restricts their activity to the Site, thus deriving 100% of their diet (the primary source of exposure to chemicals) from the Site. This assumption is implicit in the assumption of a value of "1" for the Area Use Factor parameter (Page 24-10, Table 24-6 in CRWQCB, 2010) and as such represents the primary basis for the CRWQCB's conclusion of aquatic dependent wildlife risk at the Site.

The CRWQCB (2010) Area Use Factor assumption of 1 is technically flawed because this assumption fails to recognize all of the representative aquatic dependent wildlife species are expected to derive only a very small fraction of their diet from the Site. There is no reason to assume that the Site is attractive to wildlife such that it would result in this level of Site use because the Site is a heavily industrialized shipyard and does not offer natural habitat (vegetated features, undeveloped beach areas, trees or nesting platforms, etc.) that would result in anything other than infrequent Site visits and/or foraging events. The lack of habitat is expected to continue until at least 2034 to 2040 (end of current NASSCO and BAE Systems leases (CRWQCB, 2010); therefore, the assumption that wildlife will only visit the Site very infrequently is expected to remain valid for at least another 23 years.

The frequency of wildlife foraging events is quantified in an ecological risk assessment by a quantitative comparison of the size of an organism's foraging range (home range) to the size of the Site, a value referred to as the Area Use Factor or Fractional Intake values by CRWQCB (2010). Standard ecological risk assessment guidances, both on a state (DTSC, 1996) and federal (USEPA, 1997) level, prescribe using this quantitative comparison in lieu of simply assuming

100% site use. This comparison is made by dividing an animal's foraging range by the size of the Site or contaminated area (DTSC, 1996; USEPA, 1997). The foraging range represents the area in which the animal forages on a daily basis. Estimates on foraging ranges are obtainable from scientific studies and agency-promulgated compilations (USEPA, 1993). The value that is obtained from dividing an animal's foraging range by the size of the Site can be considered to be equivalent to the proportion of the diet (the main route of wildlife exposure for most chemicals) that is derived from the Site. For example, the representative species with the smallest foraging range (East Pacific green turtle, 3,700 acres (Exponent, 2003)) would only be expected to derive 4% of its diet from the Site since the Site is only 140 acres (i.e.,  $140 \div 3,700 = 4\%$ ). The other representative aquatic dependent wildlife species exhibit larger foraging ranges than the East Pacific green turtle and would be expected to forage at the Site approximately 1% of the time based on their respective foraging ranges (Exponent, 2003). If these technically-supportable Area Use Factors of 0.01 to 0.04 (1 to 4%) are applied to Site chemical intake estimates (using the equation on page 24-9 of CRWQCB (2010)), all Hazard Quotients (as shown in Table 24-3 of CRWQCB (2010)), ecological risk potential would not be recognized. Contrary to the USEPA and DTSC approach, the CRWQCB (2010) assumption of an Area Use Factor of 1 grossly overestimates dietary intake of Site chemicals by a factor of 30 to 100.

The selection of an Area Use Factor of 1 by the CRWQCB (2010) appears to have been arbitrary and was made in absence of any applicable regulatory guidance or scientific evidence. Mr. Tom Alo, the CRWQCB's Person Most Knowledgeable (PMK) and lead CRWQCB ecological risk assessor assigned to the Site, stated in his February 17, 2011 deposition that the value of 1 was selected by Mr. David Barker, Chief, Surface Water Basins Branch, CRWQCB (Pages 117-121 in Alo, 2011). Alo stated that this decision was not supported by any technical guidance or scientific evidence, and agreed that it is probable that wildlife do not forage exclusively within the Site (Alo, 2011).

#### 4.3 Conclusion

The CRWQCB (2010) assumption of a value of "1" (100%) for the Area Use Factor is not based upon any site-specific evidence, is not technically-supportable, and is contrary to state and federal ecological risk assessment guidance. Consideration of the Site-specific evidence of usage by wildlife in a manner consistent with USEPA and DTSC ecological risk assessment guidances demonstrates that ecological risk potential is absent from the Site. Because there is an absence of risk potential for aquatic-dependent wildlife, identification of COCs causing Aquatic-dependent Wildlife BUI is unnecessary, as is the derivation of a remedial footprint using the analysis of SWACs (Section 32, CRWQCB (2010)). Consideration of Aquatic dependent wildlife BUI should be withdrawn from the DTR.

**Comment ID:** 108

**Organization:** Coastkeeper and EHC

**DTR Section:** 32

**Comment:**

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CONCLUSIONS

The Order and DTR fail to demonstrate based on substantial evidence in the record that cleanup to background concentrations is not economically feasible. The proposed cleanup fails to meet legal requirements for a cleanup to a pollutant level greater than background and does not represent a cleanup to the best water quality which is reasonable "considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." See State Water Board Order 92-49. However, minor changes in alternative cleanup level implementation, monitoring requirements, and the remedial footprint can transform the proposed cleanup into a cleanup that is both legal and the protective of existing and anticipated beneficial uses in San Diego Bay.

**Comment ID:** 109  
**DTR Section:** 34

**Organization:** Coastkeeper and EHC

**Comment:**

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CONCLUSIONS

The Order and DTR Must Require that the Remediation Achieve the Alternative Clean-up Levels.

The proposed cleanup violates the law because it sets alternative clean-up levels that are not actually maximum pollutant concentrations. See State Water Board Order 92-49. While the Proposed Site-Wide Alternative Cleanup Levels are reasonable, the "120% of background" second-dredging pass trigger and the "Trigger Concentrations" work together to allow the pollutant levels at the Site to exceed Alternative Cleanup Levels at the Site following remediation. The Regional Board cannot legally approve the Order and DTR with the provisions that allow pollutant levels to exceed the Alternative Cleanup Levels because there is no evidence in the record that pollutant levels above the Alternative Cleanup Levels "Vill not pose a substantial present of potential hazard to human health and the environment." See CAL. CODE REGS. tit. 23 §2550.4(c).

To address this problem, the Regional Board should do three things:

1. Direct that a second dredging pass is required if the concentration of any primary contaminant of concern exceeds background concentration in a remediated polygon (or, as explained below. retain the 120% of background second-pass dredging rule and add eight more polygons to the remedial footprint);
2. Set the "Trigger Concentration" at the Alternative Cleanup Levels listed in Table 2 of the Order (the Site-wide Post-Remedial SWACs); and
3. Mandate additional remediation if the "Trigger Concentrations" are exceeded.

**Comment ID:** 110  
**DTR Section:** 31

**Organization:** Coastkeeper and EHC

**Comment:**

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## CONCLUSIONS

The Regional Board Should Make an Independent Finding of What Level of Cleanup is Economically Feasible Based on all the Evidence in the Record Regarding Economic Feasibility.

The economic feasibility analysis presented in DTR § 31 fails to present the results of the analysis in a manner that allows that Regional Board to make a reasoned decision regarding what level of cleanup is economically feasible. Once the results are presented on pollutant-by-pollutant basis and along a continuous "dollars spent" x-axis, it becomes clear that \$33 million is not a reasonable cut-off for what cleanup is economically feasible "considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." See State Water Board Order 92-49. Therefore, economic feasibility conclusions based solely or heavily on analysis in DTR § 31 are arbitrary and capricious.

The Regional Board should independently evaluate the economic feasibility analysis and determine at what point, if any, benefits of additional remediation become "negligible" and above which no further remediation should be required. We urge the Regional Board to set this level well above the \$33 million level set in DTR § 31 and that forms the basis for setting the Alternative Cleanup Levels. See DTR §32.2 at 32-12 ("An assessment of risk to wildlife receptors under projected post-remedial conditions was conducted to confirm the alternative cleanup levels established by economic analysis (Section 31) are adequately protective of aquatic-dependent wildlife beneficial uses." (emphasis added)).

**Comment ID:** 111

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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## CONCLUSIONS

The Proposed Remedial Footprint Should Be Enlarged by Eight Polygons.

Station NA22 is "Likely" impaired based on moderate sediment chemistry, moderate toxicity, and moderate benthic community impairment. See DTR § 33.1.1 at 33-4. Polygon NA22 should be added to the Remedial Footprint to address the real risks pollution in this polygon poses to current beneficial uses. Excluding NA22 from the remedial footprint in the hope that another process will address contamination there decades from now ignores the present threat contamination in NA22 poses to current beneficial uses. See above at IV.B.2.a. Further, by excluding NA22 from the Post Remedial Monitoring program, the Order and DTR try to pretend that NA22 is not part of the Shipyard Sediment Site. By failing to include NA22 in the Post Remedial Monitoring, the Order and DTR underestimate the site-wide average pollutant levels in an attempt to mask the true consequences of refusing to remediate a portion of the Site that poses unacceptable risk to beneficial uses.

Likewise, NA01, NA04, NA07, NA16, SW06, SW18 and SW29 pose unacceptable risks to fish and the benthic community and should be added to the remedial footprint to address these risks.

See above at IV.B.2.b. Furthermore, adding NA22, NA01, NA04, NA07, NA16, SW06, SW18 and SW29 would ensure that the alternative cleanup levels are met even if the 120% background trigger level for a second dredging pass is retained.

[ Coastkeeper/EHC Table 4. Comparison of Post-Remedial Pollutant Concentration When Second-Pass Dredging Trigger Set at 120% of Background for Proposed Remedial Footprint and for Proposed Remedial Footprint with Eight Additional Polygons. ]

[ Table Note 9 - Sec Exhibit K ]

Remediating eight additional polygons is economically feasible. To remediate the additional eight polygons would require dredging an additional 120,000 cubic yards of sediment—30,550 cubic yards from NA22 and the remaining 89,400 cubic yards from the other 7 polygons. See "2010-07-27 Economic feasibility 07-27-IO^g.-xls" (SAR384569). At an estimated cost of \$7 per cubic yard outside the leasehold and \$13 per cubic yard inside the leasehold, [Footnote 10 - These numbers represent the "Probable Likely Unit Cost" as represented in "Economic Feasibility Source Data," provided to counsel for San Diego Coastkeeper and Environmental Health Coalition at the deposition of David Barker on March 3, 2011. It is unclear whether these numbers are a fair representation of actual dredging costs because the source of this cost assumption was not provided.] the total additional dredging cost would be approximately \$1.5 million, [Footnote 11 - This number includes only the cost to dredge the additional eight polygons and does not add in additional costs that may be associated with dredging, such as sediment disposal or mitigation costs.] or only 2% of the current estimated cleanup cost. [Footnote 12 - According to DTR § 32.7.1 at 32-40, the estimated cleanup cost is \$58 million.]

[ Coastkeeper/EHC Table 5. Dredging Cost for Additional Polygons [Table Note 13 - Source of data: DTR Appendix 31, table A31 -2.] ]

As Section II above demonstrates, \$58 million does not achieve the best water quality reasonable, nor is the proposed cleanup the lowest levels economically achievable. See CAL. CODE REGS. tit. 23 §2550.4 (e).

A map of the additional eight polygons in relation to the polygons already included in the Proposed Remedial Footprint is incorporated herein and attached as Exhibit I.

**Comment ID:** 112

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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CONCLUSIONS

The Monitoring Requirements Should Be Strengthened to Ensure the Best Water Quality Reasonable.

To ensure the cleanup achieves the "best water quality reasonable." the Remediation Monitoring and Post Remedial Monitoring requirements should be strengthened. See MacDonald 2011 at 20. Without stringent Remediation Monitoring to ensure that the Alternative Cleanup Levels are actually achieved throughout the entire Shipyard Sediment Site, it is highly likely that existing and/or future beneficial uses in San Diego Bay will be unreasonably affected. See MacDonald 2011 at 20. We recommend that the water quality and sediment monitoring protocols recommended by Donald MacDonald be adopted. See MacDonald 2011 at 27.

Likewise, the current Post Remedial Monitoring requirements are insufficient to evaluate the effectiveness of the remedial measures and identify the need for further remediation to achieve the clean-up goals at the Shipyard Sediment Site. To ensure the Post Remedial Monitoring requirements can determine whether or not the remedial measures were effective and whether or not additional remediation is necessary to achieve cleanup goals, we recommend that the changes to the Post Remedial Monitoring Program recommended by Donald MacDonald should be adopted. See MacDonald 2011 at 32-33.

**Comment ID:** 113

**Organization:** Coastkeeper and EHC

**DTR Section:** 34

**Comment:**

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CONCLUSIONS

Additional Trigger Concentrations and Triggers for Benthic Invertebrates Should Be Added to Ensure the Best Water Quality Reasonable.

To ensure the "best water quality reasonable." additional "trigger concentrations" for the secondary Contaminants of Concern should be added to the Post-Remedial Monitoring requirements. Likewise, triggers addressing benthic invertebrates should be added to the Post-Remedial Monitoring requirements. According to Donald MacDonald's recommendations, we urge the Regional Board to adopt the following additional trigger concentrations:

[ Table - RECOMMENDED ADDITIONAL TRIGGER CONCENTRATIONS ]

[ Table Note 15 - See MacDonald 2011 at 35. ]

**Comment ID:** 116

**Organization:** BAE Systems

**DTR Section:** 14 to 20

**Comment:**

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I. AQUATIC LIFE IMPAIRMENT (TCAO FINDINGS 14-20; DTR §§ 14-20)

A. The Site-Specific Bioavailability of Chemicals at the Shipyard Sediment Site is Not Adequately Addressed (TCAO Findings 14-20; DTR §§ 14-20)

In conducting the weight-of-evidence ("WOE") approach to evaluate potential impairment of benthic macroinvertebrate communities at the Site, the DTR fails to sufficiently account for the

site-specific bioavailability of chemicals in sediment at the site, and erroneously directly relates the concentrations of chemicals in bulk sediment with their potential to cause sediment toxicity.

With respect to the WOE approach used in the DTR in general, Dr. Ginn [Footnote 1 - Expert Report of Thomas C. Ginn regarding Evaluation of Draft Technical Report for Tentative Cleanup and Abatement Order No, R9-2011-0001, dated and submitted to the Regional Board on March 11, 2011 (the "Ginn 3/11/11 Expert Report").] noted that:

the WOE approach described in the DTR appears to be an unconventional assessment method developed specifically for this case, which bears little resemblance to the standards of practice for sediment quality assessments. Little or no scientific basis is provided by the Staff to justify their deviation from standard data interpretation methods, resulting ultimately in arbitrary cleanup levels with no risk basis.

(Ginn 3/11/11 Expert Report, at p. 13.)

As stated above, one of the most severe flaws with the WOE approach used in the DTR is that it erroneously equates chemical exposure with chemical toxicity, and ignores the fact that the site-specific bioavailability of the chemicals may be limited. In such cases, exposure to elevated chemical concentrations would not necessarily result in sediment toxicity or adverse effects on benthic macroinvertebrate communities. Dr. Ginn noted that:

A fundamental problem with the Staff's WOE approach is the framework that concludes that adverse effects on benthic macroinvertebrates are "possible" when there is no significant sediment toxicity and no adverse effects on benthic macroinvertebrates (see Table 18-14 of the DTR). In these cases, the conclusion of "possible" effects is driven by the characterization of "high" for sediment chemistry. In such cases where chemical and biological indicators disagree, rather than prematurely concluding that effects on benthic macroinvertebrates are "possible," the investigator should evaluate the reason for the difference between chemical and biological indicators of effect, especially because this situation may result from low bioavailability of sediment chemicals. The Staff even recognizes this situation in Section 15.1 of the DTR: "For example, sediment chemistry provides unambiguous measurements of pollutant levels in marine sediment, but provides inadequate information to predict biological impact."

(Ginn 3/11/11 Expert Report, at p. 13.)

Therefore, despite the fact that the DTR acknowledges uncertainties related to chemical bioavailability, the benthic impairment assessment places an unwarranted emphasis on bulk sediment chemistry data in the WOE approach. Dr. Ginn concluded that:

A significant error in the Staff's WOE approach is the absence of an evaluation of the chemical bioavailability information in their decision framework. This omission is unscientific and is inconsistent with the current standards of practice for sediment assessments that recognize the importance of bioavailability in determining whether a given concentration of a chemical substance will cause adverse effects.

(Ginn 3/11/11 Expert Report, at p. 15.)

In summary, the failure to explicitly consider chemical bioavailability in the WOE approach presented in the DTR results in an overly conservative analysis.

**Comment ID:** 117

**Organization:** BAE Systems

**DTR Section:** 18.4, 18.5

**Comment:**

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I. AQUATIC LIFE IMPAIRMENT (TCAO FINDINGS 14-20; DTR §§ 14-20)

B. The Benthic Community Leg of the Triad is not Given the Appropriate Weight in the Triad Analysis (TCAO Finding 18; DTR §§ 18.4, 18.5)

As second major flaw with the WOE approach used in the DTR is the failure to give the benthic community leg of the Triad more weight than the sediment chemistry and sediment toxicity legs, since the benthic evaluations at the Site directly addressed the potential effects of chemical contamination in in-place sediments on the native benthic macroinvertebrates that reside at the site. The benthic analyses are therefore the most relevant leg of the Triad for assessing effects on the in situ benthic macroinvertebrate communities at the Site. With respect to the benthic leg of the Triad, Dr. Ginn noted that:

“it is the one LOE that addresses the actual responses of organisms living in or on the sediments at the site. Alternatively, the chemistry data represent the potential exposures existing at the site and the laboratory toxicity tests represent potential responses of test organisms under laboratory conditions.”

(Ginn 3/11/11 Expert Report, at p. 28.)

Dr. Ginn noted that Section 15.2 of the DTR recognizes that a WOE approach necessarily involves the use of best professional judgment (“BPJ”) to integrate the lines of evidence and assess the quality, extent, and congruence of data. He then discussed a recent study of the consistency of BPJ in the interpretation of Triad data that was published by Bay et al. (2007b). In that study, the authors relied on a panel of six individuals, whom they considered to be sediment experts, to independently evaluate Triad data from 25 California embayment sites and categorize each site according to its environmental condition (likely unimpacted, possibly impacted, likely impacted, etc.). Dr. Ginn noted that:

The results showed considerable inconsistencies in the categorical assignments of the various sites among panel members, and the differences among panel members were associated primarily with different approaches to weighting of the three lines of evidence. However, overall the panel members placed the greatest weight on the benthic community leg of the Triad.

(Ginn 3/11/11 Expert Report, at p. 14.)



Despite the fact the sediment quality experts gave the greatest weight to the benthic community leg of the Triad, the DTR WOE approach tends to place a greater weight on the sediment chemistry and sediment toxicity legs. Therefore the DTR is inconsistent with the evaluations conducted by the sediment quality experts in Bay et al. (2007b).

In discussing the variability in sediment quality categories that can arise from different experts with considerable experience in sediment assessments, Bay et al. (2007b) noted that:

...the expertise of personnel at state and local agencies responsible for conducting or interpreting sediment quality assessments is highly variable and can lead to different interpretations of the same data set.

As noted by Dr. Ginn, the identity or qualifications of any experts who exercised the BPJ that led to the WOE assessment presented in the DTR is unclear.

Inspection of the Sediment Quality Objectives (“SQOs”) for enclosed bays and estuaries in California (CSWRCB (2009)) shows that more weight is given to the benthic community leg of the Triad than the sediment toxicity leg. For example, Table 9 of CSWRCB (2009) presents the Severity of Biological Effects Matrix. Inspection of that matrix shows that the low, moderate, or high benthic condition categories determine the overall effects designation for a station, regardless of the toxicity categories. For example, if a station is in the Low Disturbance Category for benthic condition, its overall biological severity designation is Low Effects, regardless of whether the toxicity condition is in the Low, Moderate, or High Toxicity Categories. Therefore, although the Site is explicitly exempt from regulation by the SQOs, it is instructive that the SQOs are consistent with the sediment quality experts in Bay et al. (2006b), by giving greater weight to the benthic community leg of the Triad than the sediment toxicity leg.

Therefore, the failure of the DTR to give the benthic community leg of the Triad more weight than the sediment chemistry and sediment toxicity legs, ignored the greater importance of that leg, as documented in Bay et al. (2007b) and CWSWRCB (2009), and led to an overly conservative assessment that gave unwarranted weight, in particular, to the sediment chemistry leg of the Triad.

**Comment ID:** 118

**Organization:** BAE Systems

**DTR Section:** 18.3, 18.5

**Comment:**

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I. AQUATIC LIFE IMPAIRMENT (TCAO FINDINGS 14-20; DTR §§ 14-20)

C. The Results of the Bivalve Larvae Sediment Toxicity Test are Given an Inappropriate Amount of Weight in the Triad Analysis (TCAO Finding 18; DTR §§ 18.3, 18.5)

Dr. Ginn noted that that there were substantial discrepancies between the results for the bivalve larval development test, and the other two toxicity tests that were evaluated at all 30 Triad stations at the Site (i.e., the amphipod survival test and the sea urchin fertilization test). Table 18-

Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

8 of the DTR shows that significant toxicity was found at 12 of the 30 Triad stations for the bivalve larvae test. By contrast, significant toxicity was found at only one of the 30 Triad stations for the amphipod test, and at none of the 30 stations for the sea urchin test. Moreover, no significant toxicity was found for the other two toxicity tests at any of the 12 stations at which significant toxicity was found for the bivalve larvae test. In light of these major discrepancies, Dr. Ginn stated that:

Based on the low correspondence with other toxicity tests and with sediment chemistry, it is important to assess whether the bivalve larvae test is producing accurate and reliable results. Experience at other sites has shown that the bivalve larvae test does not have the same reliability as the amphipod test. For example, Thompson et al. (1997) found weak relationships between sediment contamination and the results of bivalve larvae tests in San Francisco Bay. In the same study, the authors reported significant relationships between mixtures of sediment contaminants and the results of the amphipod test using *Eohaustorius*, the same species used for the shipyard study. Bay et al. (2007a) note that the bivalve larvae sediment-water interface test has only fair reproducibility among laboratories and has a low relative precision of the response.

(Ginn 3/11/11 Expert Report, at p. 23.)

Inspection of the Quality Assurance and Quality Control Report ("QA/QC Report") for the bivalve larvae tests conducted at the 30 Triad stations at the Site (Appendix H of Exponent 2003) shows that problems were identified for this test, and that it was recommended that those problems be considered when the bivalve results were analyzed in the overall Triad analysis. Specifically, the QA/QC Report stated that:

Test organism responses in the second test batch may have been more sensitive to the fine-grained sediment than the test organisms in the first batch.

(Appendix H of Exponent 2003)

In addition, The QA/QC Report for the bivalve test stated that:

Examination of the abnormality results for each sample showed that results for several samples exhibited unusually high variability due primarily to a single outlier value.

(Appendix H of Exponent 2003)

Finally, the QA/QC Report for the bivalve test concluded that:

Unusually high variability was observed in the abnormality results for several samples. This variability is not clearly attributable to any aspect of laboratory performance or to specific conditions within the unusual replicates... The variability in the test results may reflect varying sensitivity within the group of test organisms. In addition, modification of the standard bivalve test method... to isolate the larvae from the sediment... may have introduced physical variations

within the test chamber that affect larval development. The lack of consistency among some bivalve test replicates may indicate problems with the bivalve test method or test conditions, and should be considered during data interpretation. Although the high variability does not appear to be a QA/QC issue, it could affect interpretation of the results, and should be considered during data analysis.

(Appendix H of Exponent 2003)

Therefore, the failure of the DTR to acknowledge or address the issues identified with the bivalve larvae test identified in the QA/QC Report, as well as the discrepancies in the toxicity designations based on the bivalve test compared with those based on the amphipod and sea urchin tests, resulted in an overly conservative analysis in which sediment toxicity was considered “Moderate” in Tables 18-1 and 18-9 of the DTR on the sole basis of the questionable results for the bivalve test.

**Comment ID:** 119  
**DTR Section:** 19.1

**Organization:** BAE Systems

**Comment:**

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I. AQUATIC LIFE IMPAIRMENT (TCAO FINDINGS 14-20; DTR §§ 14-20)

D. Bioaccumulation Data is Incorrectly Interpreted (TCAO Finding 19; DTR §19.1.)

Finding 19 of the TCAO states:

The San Diego Water Board evaluated initial laboratory bioaccumulation test data to ascertain the bioaccumulation potential of the sediment chemical pollutants at the Shipyard Sediment Site. Examination of laboratory test data on the chemical pollutant concentrations in tissue of the clam *Macoma nasuta* relative to the pollutant concentrations in sediment indicates that bioaccumulation of chemical pollutants is occurring at the Shipyard Sediment Site.

However, expert opinion disagrees with the expressed findings. “The Board has inappropriately interpreted the bioaccumulation data by not fully evaluating the consequences of any bioaccumulation through an appropriate risk assessment.” (Allen 3/11/11 Expert Report, at p. 18.) [Footnote 2 - Expert Report of Herbert E. Allen regarding Importance of Bioavailability for Risk Assessment of Sediment

Contaminants at the NASSCO Site – San Diego Bay, dated and submitted to the Regional Board on March 11, 2011.

(the “Allen 3/11/11 Expert Report).] More specifically, Dr. Allen opines:

5.2. Bioaccumulation at the Shipyard Sediment Site.

The Tentative Cleanup and Abatement Order (California Regional Water Quality Control Board - San Diego Region. 2010a) evaluates *Macoma nasuta*. It is correctly noted that concentrations of arsenic, copper, lead, mercury, zinc, TBT, total PCBs, and high molecular weight PAHs in the *Macoma nasuta* tissue increase with respect to their concentrations in the sediment. This leads to

the conclusions that these compounds are bioavailable at the Shipyard Sediment Site and that bioaccumulation is occurring at the site.

These conclusions regarding bioavailability and bioaccumulation are extended to further assessments regarding chemicals. For example, those chemicals that have been selected as Indicator Chemicals, arsenic, copper, lead, mercury, zinc, TBT, high molecular weight PAHs, and total PCB homologs were selected based solely on the results of Macoma tissue bioaccumulation. This is contrary to the narrative water quality objective for toxicity applicable to San Diego Bay and the Shipyard Sediment Site which provides that: “All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.” The Macoma tissue bioaccumulation testing does not assess the required toxicity or assessment of detrimental physiological responses that are specified in the water quality objective. It merely indicates that the chemicals are present in the exposed Macoma. To assess the responses specified in the water quality objective, an appropriate risk assessment must be carried out.

### 5.3 Conclusions.

Bioaccumulation is a normal process for both metals and organic compounds. High levels of bioaccumulation can lead to detrimental responses either in the organism that has bioaccumulated the compound or in consumer organisms. An appropriate risk assessment must be carried out to evaluate if the bioaccumulation produces risk to consumer organisms.

(Id. at pp. 19-20.)

BAE Systems concurs and joins in the opinions of Dr. Allen with respect to bioaccumulation and bioavailability. Based on Dr. Allen’s opinions, it is likely that the Regional Board’s risk assessment conclusions have been overstated for risks that certain chemicals pose to various Bay organisms.

**Comment ID:** 120

**Organization:** BAE Systems

**DTR Section:** 24.2.2, Table 24-6

**Comment:**

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II. AQUATIC-DEPENDENT WILDLIFE IMPAIRMENT ANALYSIS’ TIER II EXPOSURE PARAMETER ASSUMPTION REGARDING AREA USE FACTOR IS OVERLY CONSERVATIVE AND UNSUPPORTED (TCAO FINDING 24; DTR § 24.2.2, TABLE 24-6)

This “Tier II risk assessment objective was to more conclusively determine whether or not Shipyard Sediment Site conditions pose an unacceptable risk to aquatic-dependent wildlife receptors of concern.” (TCAO, Finding 24.) “Based on the Tier II results, as summarized in Table 24-1 and Table 24-2 [of the DTR], the San Diego Water Board determined that ingestion of prey caught within all four assessment units at the Shipyard Sediment Site poses a risk to all aquatic-dependent wildlife receptors of concern (excluding the sea lion).” (DTR, § 24.1.)

The DTR's aquatic-dependent wildlife Tier II impairment analysis includes an area-use factor ("AUF") assumption which is defined as the "fraction of the daily intake of a given dietary component or inert medium derived from the site (unitless area-use factor)." (DTR, § 24.2.2.) This Tier II analysis uses an AUF value of 1, which equate to an assumption that the receptors selected will catch and consume 100% of their prey from within the Shipyard Sediment Site. (Deposition of Tom Alo ("Alo Deposition"), Vol. II, at 329:7-12.)

With respect to Finding 24 and the associated sections of the DTR supporting that finding, expert opinions, as well as that of the Cleanup Team itself, are in accord: the DTR's use of a 100% AUF assumption in this Tier II analysis is overly conservative, unsupported by evidence or authority, and results in a significant overestimation of risk to aquatic-dependent wildlife.

Dr. Ginn addressed the 100% AUF assumption used by the DTR in this analysis:

#### Failure to Consider Actual Habitat Use

One of the primary risk-driving assumptions made by the Staff in their exposure assessment is selection of an area use factor (AUF) of 1.0 for all receptors. In other words, for purposes of risk evaluation, it is assumed by the Staff that all modeled receptors obtain 100 percent of their diet from within the confines of the [Shipyard Sediment Site]<sup>3</sup>, and that prey items sampled at [the Shipyard Sediment Site] stations are therefore representative of the entire diet for each receptor. This assumption is clearly unrealistic, and the resulting conclusions based on this model are an inaccurate representation of actual wildlife exposure and risk.

(Ginn 3/11/11 Expert Report, at p. 59.)

Dr. Ginn also explains that the aquatic-dependent wildlife ecological risk assessment ("ERA") set forth in the TCAO/DTR is "clearly not compliant with" federal or California regulatory guidance and standards for AUF application. (Id. at pp. 61-65.)

Tom Alo was designated by the Cleanup Team as its "Person Most Knowledgeable" regarding aquatic-dependent wildlife impairment, and was deposed in that capacity. (Alo Deposition, Vol. II at 303:3-9.) Speaking on behalf of the Cleanup Team in that capacity, Mr. Alo agreed that the 100% AUF assumption is "very conservative." (Id. at 331:16-19.) Mr. Alo further conceded that the Cleanup Team was not relying upon any guidance document or agency policy in selecting a 100% AUF assumption (id. at 333: 21-23), and agreed that it is "actually probable" that the selected receptors consume some amount of their diet from outside the Site. (Id. at 334:16-19.) Indeed, several of the receptors used in this analysis are migratory, and thus by definition cannot be permanent residents of Site. (Id. at 334:20-23.) And, importantly, Mr. Alo recognized that Tier II analyses should use site-specific and species-specific AUF data:

15 Q. Mr. Alo, in light of both EPA and state  
16 guidance on this subject, wouldn't you agree that it's  
17 reasonable to use site-specific and species-specific  
18 area use factors for Tier 2 aquatic dependent wildlife  
19 risk assessment?

20 MR. CARRIGAN: Documents speak for themselves.

21 Calls for a legal conclusion.

22 You can answer.

23 THE WITNESS: Yes.

(Id. at 340:15-23.)

Exponent (2003) calculated site-specific and species-specific AUFs for the same identified receptors. That data was reflected in Table 28-6 of the DTR for TCAO No. R9-2010-0002, released in December, 2009. With respect to the area identified as “Inside SWM”, the AUF for every receptor is less than 1%. [Footnote 4 - .6% for the East Pacific Green Turtle, .2% for all other receptors.] (Id.) The AUFs for “Inside NASSCO” are approximately the same. (Id.) Mr. Alo was questioned regarding the variance between the Exponent-calculated site-specific and species-specific AUFs, and the 100% AUF assumption used by the Regional Board in the DTR:

22 Q. Other than being very or overly protective, is  
23 there any other reason why this site-specific data based  
24 on receptors in San Diego Bay, based on the  
25 characteristics of the NASSCO leasehold and based on the 344  
1 scientific literature cited by Exponent in the  
2 development of this table, is there any reason why you  
3 would not use this in connection with your Tier 2 risk  
4 assessment?

5 A. Again, I would have to look into it further and  
6 consult with other experts such as the natural resource  
7 trustee agencies.

8 Q. Okay. Let's assume for a minute that the  
9 1.1 percent is an accurate estimation of the area use  
10 factor of the East Pacific green turtle inside the  
11 NASSCO leasehold.

12 The DTR used a factor of a hundred percent,  
13 correct?

14 A. Correct.

15 Q. So that would be roughly a hundred times this  
16 area use factor?

17 MR. CARRIGAN: Vague. Excuse me.

18 THE WITNESS: Roughly. Correct.

19 BY MR. RICHARDSON:

20 Q. 99 percent, is that closer? 99 times more?

21 So if the risk assessment were adjusted to  
22 account for the one-percent area use factor calculated  
23 by Exponent, what would that do to the overall risks  
24 calculated in the Tier 2 assessment?

25 A. That would likely lower the risk.

345

1 Q. By approximately a hundredfold. Correct?

Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

- 2 A. (Witness nods head.)  
3 Q. I'm sorry?  
4 A. Yes.  
5 Q. The reporter can't take down a head nod.  
6 That difference can be significant, right? I  
7 mean, it could be the difference between triggering a  
8 threshold and not triggering a threshold?  
9 A. That's correct.  
10 Q. Did the Cleanup Team conduct any study of the  
11 actual use of these receptors or other receptors at the  
12 shipyard?  
13 A. No, we did not.  
14 Q. Did the Cleanup Team calculate any  
15 site-specific area use factors for any species at the  
16 shipyard?  
17 A. No, we did not

(Alo Deposition, Vol. II at 344:22-346:17.)

With respect to BAE Systems' leasehold, if Exponent's site and species-specific data were used instead of the default 100% AUF assumption, then based on Mr. Alo's testimony the aquatic-dependent wildlife risk at the BAE Systems' leasehold is overstated by approximately 500% for five of the six receptors, and by approximately 167% for the East Pacific Green Turtle.

In conclusion, as stated by Dr. Ginn, "[t]he Tier II ERA in the DTR is unrealistically biased by the reliance on Tier I (screening level) assumptions about exposure (e.g., area use)." (Ginn 3/11/11 Expert Report, at p. 74.) "The ERA uses unrealistic and nonscientific estimates of wildlife use of the shipyard as foraging habitat. The use of these values in the ERA results in dramatic overestimates of risk to wildlife." (Id.) BAE Systems concurs and joins in Dr. Ginn's expert opinions with respect to the aquatic-dependent wildlife impairment analysis. (See *id.*, at pp. 59-75.) Those opinions are directly supported by the testimony of the Cleanup Team's person most knowledgeable on this topic, Mr. Alo, as set forth above.

**Comment ID:** 121

**Organization:** BAE Systems

**DTR Section:** 25-28

**Comment:**

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III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

A. Human Health Beneficial Uses REC-1 and REC-2 are Not Adversely Impacted by Concentrations of Pollutants Present in the Marine Sediment At the Site (TCAO Finding 25; DTR § 25.1)

Finding 25 of the TCAO concludes that four identified beneficial uses (REC-1, REC-2, SHELL, and COMM) are "impaired due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site." Section 25.1 of the DTR identifies the same four

beneficial uses, and states “concentrations of the pollutants present in the marine sediment within and adjacent to the Shipyard Sediment Site causes or threatens to cause a condition of pollution or contamination that adversely impacts these four beneficial uses and thereby constitutes a threat to the public health.” (DTR, § 25.1) (emphasis added).

Tom Alo was designated by the Cleanup Team as its “Person Most Knowledgeable” regarding human health impairment, and was deposed in that capacity. (Alo Deposition, Vol. I at 23:7-17.) Speaking on behalf of the Cleanup Team in that capacity, Mr. Alo testified that beneficial uses REC-1 and REC-2 present minimal risk to human health:

15 Q. Mr. Alo, it's my understanding that in light of  
16 U.S. EPA's position in an analysis conducted under the  
17 DTR, that the cleanup team concluded that contact water  
18 recreation and non-contact water recreation presented  
19 minimal risk to human health; is that correct?

20 A. That's correct.

21 Q. So the focus of the human health impairment  
22 section, as you stated previously, was on shellfish  
23 harvesting and commercial and sportfishing, correct?

24 A. Correct.

(Alo Deposition, Vol. I, at 66:25-68:24.)

Thus, Finding 25 of the TCAO and § 25.1 of the DTR should be revised to clarify that the Cleanup Team did not find human health risks associated with the beneficial uses Contact Water Recreation (REC-1) and Non-Contract Water Recreation (REC-2) to be impaired by the pollutants present in the marine sediment within and adjacent to the Site.

**Comment ID:** 122

**Organization:** BAE Systems

**DTR Section:** 26.1, 28.2.2.1

**Comment:**

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III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

B. Human Health Impairment Analysis' Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

The DTR's human health impairment Tier II analysis defines Fractional Intake as: “fractional intake of seafood consumed that originates from the Site.” (DTR at 28-4.) Key assumptions underlying the DTR's fractional intake analyses include, but are not limited to, (1) fractional intake value of 1 (100%), (2) complete exposure pathway for anglers at the site, (3) consumption rates of 21g/day for recreational anglers and 161g/day subsistence anglers, and (4) an exposure duration of 30 years. While leeway for overly conservative assumptions may be appropriate for a Tier I screening level assessment, they are entirely inappropriate for a Tier II assessment. (Ginn 3/11/11 Expert Report, at p. 79.)



The TCAO/DTR's human health Tier II analyses, and thus the resulting tentative decisions, are based on the stringing-together of overly conservative, implausible (if not impossible) assumptions that "an angler visits the leasehold on a daily basis (choosing not to fish at anywhere else in the bay), bypassing armed security, catches fish and lobster that contain the maximum arsenic and PCB concentrations, then takes his catch home and consumes the entire fish and lobster, entrails and all." (Finley 3/11/11 Expert Report, at p. 22.) [Footnote 5 - Expert Report of Brent L. Finley Regarding the Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 (San Diego Bay), dated and submitted to the Regional Board on March 11, 2011 (the "Finley 3/11/11 Expert Report").]

Dr. Ginn succinctly summarizes the result of these compounding errors:

[T]he overly-conservative assumptions used in the Tier II baseline risk assessment result in a meaningless and implausible assessment that is constructed under the guise of being "conservative." These overly-conservative and unsubstantiated assumptions have a dramatic effect on the resultant risk calculations. In effect, the DTR is combining a series of extreme assumptions, which result in a multiplicative effect on the final risk calculations.

(Ginn 3/11/11 Expert Report, at p. 81.)

BAE Systems concurs and joins in these concerns as expressed by experts Dr. Ginn and Dr. Finley. Several of said assumptions are addressed in more detail below.

**Comment ID:** 123

**Organization:** BAE Systems

**DTR Section:** 28.2.2.1

**Comment:**

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III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

B. Human Health Impairment Analysis' Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

1. Tier II Fractional Intake Assumption Value of 1 is Overly Conservative and Unsupported (TCAO Findings 28; DTR § 28.2.2.1)

The DTR's Tier II analyses assume that 100% of the fish and shellfish caught by the hypothetical receptor anglers would be sourced from the Shipyard Sediment Site. However, expert opinions, as well as that of Mr. Alo, are in accord: this assumption is overly conservative, unsupported by evidence or authority, and results in an overestimation of risk to human health.

"This assumption greatly overestimates Site chemical exposure to anglers." (Environ 3/11/11 Human Health Report, at p. 7.) [Footnote 6 - Expert Report of Environ entitled Evaluation of CRWQCB Human Health Risk Assessment for the San Diego Shipyard Sediment Site, dated and submitted to the Regional Board on March 11, 2011 (the "Environ 3/11/11 Human Health Report").] And it "is not reasonable because there is a lack of a complete exposure pathway."

(Id.) Environ concludes that the Regional Board's assumption of a fractional intake value of 1 "is not supported by applicable agency guidance or scientific evidence." (Id. at 8.)

Dr. Ginn is in accord:

The most unrealistic assumption used in the DTR Tier II assessment is the FI. FI represents the portion of the seafood diet that an angler would receive directly from the assessment area. In the DTR, FI is set to 100 percent, the same value used in the Tier I screening-level assessment. In other words, the baseline risk assessment (and determination of need for remediation) is entirely based on the assumption that both recreational and subsistence anglers catch all of the fish or lobster that they consume within the boundaries of the Site. This assumption is clearly unrealistic and does not reflect actual or potential usage of the Site by recreational or subsistence anglers.

(Ginn 3/11/11 Expert Report, at pp. 81-82.)

The Regional Board actually concedes the same in the DTR: "Since it is likely that anglers catch at least a portion of their seafood from other locations in San Diego Bay and/or the fish caught from the Shipyard Sediment Site comes from elsewhere, the actual site fractional intake is likely to be less than 100 percent." (DTR, § 28.2.6.) The 100% assumption is used by the Regional Board despite the acknowledgment in the DTR that fishing is unlikely and currently prohibited at the Site, as detailed in section III-B-2 below. Based upon these factors and others, Exponent (2003) used a fractional intake assumption for inside the BAE Systems leasehold of 2.3%. (DTR, § 28.2.6.) Exponent's assumption was calculated by taking the length of the shoreline and piers of the shipyards, and comparing it to the length of the shoreline of San Diego Bay. (Alo Deposition, Vol. I at 98:9-99:16.) That assumption itself was conservative considering Exponent assumed fishing inside the heavily-secured Site, where fishing is prohibited, would be at least as attractive as fishing elsewhere in San Diego Bay. (Id.)

In comparison to the Exponent-calculated fractional intake assumption of 2.3% to the DTR's assumption of 100%, Mr. Alo agreed that 100% is an "extremely conservative assumption." (Id., at 95:1-4.) And Mr. Alo does "not [dispute] the accuracy [of Exponent]. We just didn't agree with that fractional intake." (Id. at 97:18-21.) Mr. Alo defended the DTR's use of a 100% fractional intake assumption by reference to the considerations set forth in bullet point format in the DTR at pages 28-10 and 28-11, including (1) the possibility that despite the fishing prohibition, BAE Systems or Navy personnel may fish off of the piers, (2) although BAE Systems has a long term lease through 2034, it is possible BAE Systems may not occupy the site in the future and site usage may allow for fishing, and (3) the possibility that pollutants within the BAE leasehold may migrate to areas outside the leasehold where fishing is permitted. (Id. At 93:18-94:8.) As detailed in section III-B-2 below, those stated considerations should be disregarded in the human health impairment analysis, and consequently the DTR's AUF assumption is without justification.

**Comment ID:** 125  
**DTR Section:** 28.2.2.1  
**Comment:**

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**Organization:** BAE Systems

### III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

#### B. Human Health Impairment Analysis' Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

##### 2. Tier II Assumption of a Complete Exposure Pathway for Anglers at the Site is Overly Conservative and Unsupported (TCAO Findings 26, 28; DTR § 28.2.2.1)

Although it is recognized that “public fishing and shellfish harvesting are currently unlikely events at the Shipyard Sediment Site due to the current security measures,” the TCAO/DTR nonetheless assumes a complete exposure pathway exists for human anglers to catch shellfish and fish from within the Site. (DTR § 28.2.2.1.) In support of that assumption the Cleanup Team relied upon four recommended considerations provided by Mr. Brodberg of the Office of Environmental Health Hazard Assessment ("OEHHA"). (DTR, p. 27-5.)

The Environ 3/11/11 Human Health Report addressed, inter alia, the assumption in the TCAO/DTR of a complete exposure pathway for human anglers (see Section 2.1). For the reasons stated therein, and to conserve judicial and party resources by not re-stating the same here, BAE Systems joins in Environ’s evaluation and criticism of this assumption as stated in Section 2.1, 2.1.1, and 2.1.2 of the Environ 3/11/11 Human Health Report, as well as the resulting relevant portion of the Conclusion stated in Section 3 of the same. In sum, the assumption of a complete exposure pathway for anglers at the site is invalid, unsupported, and speculative. (Id.)

The four recommended considerations from Mr. Brodberg/OEHHA, relied upon by the Cleanup Team in the TCAO/DTR, suffer the same defects, as detailed by Environ. (Id.)

The Finley 3/11/11 Expert Report echoes and expands upon the DTR’s identified (but discarded) security measures precluding fishing at the Site. (Finley 3/11/11 Expert Report, at pp. 16-17). Dr. Finley also further undermines the recommended considerations relied upon by the Cleanup Team in discarding those security measures by noting the applicable regional governmental authorities’ plans for the Site. (Id. at p. 16.) For example, the Port’s Master Plan, dated January 2010, makes clear that the “Port Master Plan seeks to preserve and protect this unique coastal resource by limited uses to strictly marine oriented industrial ones.” (Alo Deposition, at 104:15-20; Ex. 1107 to Alo Deposition at p. 70.) The “Belt Street Industrial” area (including BAE Systems’ leasehold), a “heavy industrial district, south of the Tenth Avenue Marine Terminal, consists several well-established and highly important marine-related manufacturing, processing, and serving establishments.” (Id., at p. 72.) “The Precise Plan calls for the continued operation of the existing marine related industries.” (Id. at 73) (emphasis added.) Similarly, the City of San Diego’s General Plan, dated March 2008, mitigates against the land-use speculation contained in the DTR: “Land identified as prime industrial will undergo additional scrutiny if land use amendments are proposed that could diminish the potential role for base sector and related employment uses either before or after comprehensive community plan updates.” (Alo Deposition, at 105:12-106:20; Ex. 1108 to Alo Deposition at pp. EP-7.) The Shipyard Sediment Site is land identified as prime industrial. (Id.) Thus, the Site’s heavy marine industrial use,

including prohibition of and lack of access to angling, is extremely unlikely to change in the foreseeable future.

Moreover, the Regional Board is not aware of any literature or guidance that would instruct it to include speculative future land uses in calculating fractional intake assumptions:

11 Q. Are you aware of any guidance or literature  
12 that would instruct the cleanup team to include  
13 speculative future land uses in calculating the  
14 fractional intake?

15 MR. CARRIGAN: Vague.

16 THE WITNESS: No.

(Alo Deposition, Vol. II, at 392:11-16.)

BAE Systems is aware of no evidence in the Administrative Record, or otherwise, supporting the possibility of fishing or lobstering at the Site despite the security measures and prohibition. The Regional Board is aware of no such evidence or authority either:

5 Q. Mr. Alo, in light of your prior testimony that  
6 the administrative record is voluminous and that you are  
7 not aware of any CAO proceeding with a larger record,  
8 and because there is no evidence in this voluminous  
9 record that anyone has fished at the NASSCO site, and in  
10 light of the security measures that we just reviewed and  
11 the photographs that you saw and the discussion on  
12 page 28-10, wouldn't you agree that it's an unrealistic  
13 assumption to assume that someone fishes at the shipyard  
14 for 30 years and eats only fish caught at the shipyard?

15 MR. CARRIGAN: I'm going to object as vague.

16 But you can answer, if you understood the 17 question.

18 THE WITNESS: I agree.

(Alo Deposition, Vol. I, at 93:5-18; see also Cleanup Team's response to BAE System's Request for Admission Nos. 25-26.)

Without any evidence or authority to support them, the considerations identified in the first three bullet points on page 28-11 of the DTR do not provide a reasonable basis to discard the realities of the current and future site use and thereby assume a complete exposure pathway for the receptor anglers. Those identified considerations should thus carry no weight in the human health impairment analysis.

**Comment ID:** 126

**Organization:** BAE Systems

**DTR Section:** 28

**Comment:**

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III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

B. Human Health Impairment Analysis' Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

3. Tier II Consumption Rate Assumptions are Overly Conservative and Unsupported (TCAO Findings 26, 28; DTR § 28)

a. Expert Opinion Disagrees with the Assumed Consumption Rates (TCAO Findings 26, 28; DTR § 28)

The DTR assumes consumption rate assumptions of 21g and 161g per day for recreational and subsistence anglers, respectively. (See, e.g., DTR, Table 28-7.) These exposure assumptions are overly conservative and unrealistic. As stated by Dr. Finley:

o The RWQCB assumed that subsistence anglers would always consume the entire fish or shellfish (guts and all), which is completely unfounded and only serves to overestimate risk. It also runs counter to the information collected in a detailed study of anglers in the San Diego Bay (County of San Diego 1990).

o The RWQCB employed fish consumption rates from the anglers in the Santa Monica Bay. Considering the lack of access and industrial nature of the NASSCO shipyard, the use of fish consumption rates from the Santa Monica Bay, a highly accessible recreational area, is inappropriate and inconsistent with the practice of risk assessment in general and regulatory risk assessment guidance in particular.

(Finley 3/11/11 Expert Report, at p. 6) (emphasis in original.)

Dr. Finley further states:

The “current default EPA assumption for recreational and subsistence anglers is 2 and 6.8 g/day of the edible portions of caught fish ((USEPA, 1997); Table 10-52)” However, in their assessment, the RWQCB assumed that the subsistence angler would always consume the entire fish (sand bass) or shellfish (lobster), skin, guts, filter organs, and all, and not just the filet or edible portion. This is a critical (yet baseless) assumption that serves to artificially inflate the RWQCB risk (Finley 3/11/11 Expert Report, at p. 10) (emphasis in original.)

Dr. Finley concludes: “In summary, the RWQCB’s assumption that subsistence anglers would consume entire fish and/or shellfish following each and every trip (instead of just eating the edible portion) has resulted in risk estimates for subsistence anglers that are too high by at least an order of magnitude.” (Id. at 13.)

BAE Systems agrees and joins in the foregoing expert opinions, and the supporting data and rationale (id., at § 2-a), with respect to the consumption rates assumed in the TCAO/DTR’s Tier II human health impairment analysis.

**Comment ID:** 127

**Organization:** BAE Systems

**DTR Section:** 1.5.3.3

**Comment:**

III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

B. Human Health Impairment Analysis' Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

3. Tier II Consumption Rate Assumptions are Overly Conservative and Unsupported (TCAO Findings 26, 28; DTR § 28)

b. The EHC Fisher Survey Should be Disregarded Entirely (DTR § 1.5.3.3)

The Regional Board cites to the Environmental Health Coalition ("EHC") having conducted an "Opportunity" sample survey in 2002 of people fishing from piers near the Shipyard Sediment Site (the "EHC Fisher Survey"). (DTR, § 1.5.3.3.) The Regional Board adopts the EHC description of the survey as a "...selected sample that is highly exposed to fish from near the shipyards, Naval Station San Diego, and the Southern portion of the San Diego Bay. (Id.)

EHC Fisher Survey was not designed or conducted in a manner consistent with appropriate standards of survey design. (U.S. EPA 1992, 1998.) As a consequence, the survey results are most likely biased, are not representative, and do not provide any useful estimates of fish consumption.

The EHC Fisher Survey is based on a limited number of questionnaires conducted at three fishing sites in the San Diego Bay. Interestingly, the fishing pier closest to the NASSCO and BAE shipyards, the Coronado Pier, was not surveyed. (Deposition of Laura Hunter ("Hunter Deposition"), at 92:2-7.)

The survey authors did not consult any standard protocol in designing their survey. Neither of the survey designers were trained or educated in preparing appropriating protocol and surveys. (Id. at 95:5-15; 96:15-17.) It is not clear if EHC accounted for repeated surveys of the same individual. In a properly conducted survey, one of the first questions asked is whether or not the participant has been interviewed before. (U.S. EPA 1998; Finley 3/11/11 Expert Report, at p. 19.)

Certain methodological defects exist in the EHC Fisher Survey. The survey was introduced to participants in a way that likely biased responses. The scientific literature on survey techniques and validation documents that survey participants are susceptible to responding in a way that they believe the interviewer wants to hear. (U.S. EPA 1992.) The introduction of the questionnaire used by EHC here [Footnote 7 - "Our goal as an organization is to help communities resolve health issues and the contaminating toxins in the San Diego bay." (Ex. 604 to Hunter Deposition.)] makes it clear the interviewer believes that there are health issues associated with fish consumption. U.S. EPA (1992) guidance states, "The selection and phasing of questions to meet survey objections is critical." The narrative text raises alarms in

survey participants leading to non-impartial data likely being collected.

The survey does not state the total number of anglers at any of the piers or the fraction of those anglers who participated in the survey. Without this information the results of the survey apply only to the pier anglers who were actually surveyed and not to generalized pier anglers as a whole. The study's authors acknowledge the lack of statistical validity by saying that "[t]he survey group represents an opportunity sample of fishers from South Bay piers, it is not a randomized sample," and, "[i]t is not a representative sample of all San Diego Bay fishers or all South Bay residents." (Hunter Deposition, Ex. 603.)

EPA's Guidance for Conducting Fish and Wildlife Consumption Surveys (U.S. EPA 1998) includes nearly 70 references describing various issues related to survey design. This guidance document (U.S. EPA 1998) recommends that any one of five different statistical approaches be employed for interviews of anglers at their fishing site; these approaches are simple random sampling without replacement, stratified random sampling, systematic random sampling, two-stage sampling, and non-uniform probability sampling. EHC did not use any of these recommended approaches for selecting survey participants. EPA guidance (U.S. EPA 1998) provides further recommendations regarding the development of fish consumption rate data adequate for use in policy decisions stating:

Since consumption rates will "have a significant impact on the risk estimates and on the selection of fish consumption limits" (U.S. EPA 1992), it is important to consider carefully how the consumption rate will be determined from the questions asked. For example, consumption rates will be calculated from species-specific estimates of the frequency of fish consumption ("1 meal per week from May through July"). ... Insufficient delineation on the timing or details of consumption patterns will result in poor estimates of the consumption rate and consequently inaccurate estimates of risk.

Because of EHC's non-random selection of survey participants and poor questionnaire design, bias is almost certainly present in the survey results. The survey's conclusions regarding the frequencies of angling habits and ethnicity are therefore not verifiable indicators of the pier fishing community as a whole.

No actual consumption rates were determined or discussed. There are no measures or estimations of how frequently the fish caught are consumed. No questioning regarding the species or size of fish or sampling to determine concentrations of contaminants was performed in the fish that were consumed.

EHC results include some estimations of fishing frequency, but preparation habits are extrapolated from common cultural practices in Filipino and Asian cultures, not individual responses. (Finley 3/11/11 Expert Report, at p. 19.)

The EHC Fisher Survey emphasizes the risks associated with consumption of whole fish or fish organs. However, the survey did not ask survey participants if they consumed whole fish or fish organs. Similarly, the report emphasizes that not all anglers eat only the filet of fish, yet they never asked the participants if they fileted the fish prior to consumption. EHC equated "eating fish

skins” with “eating an entire fish,” which is clearly not appropriate since many filets are eaten with the skin on. (Deposition of Joy Williams (“Williams Deposition”), at 100:16-24, 103:21-24, 107:13-16; Hunter Deposition, at 137:3-6, 138:13-15.) The survey does not provide any data on subsistence fishing because it did not ask survey participants how much of the fish they caught they also consumed and because no information exists regarding concentration of contaminants contained in the fish eaten.

Thus, it is inappropriate to conclude that subsistence fishing or significance exposures occurred via the information obtained through the EHC surveys. The EHC Fisher Survey should be disregarded entirely for purposes of the human health impairment analyses.

**Comment ID:** 128

**Organization:** BAE Systems

**DTR Section:** 28.2.2, 28.2.2.1, Table 28-7

**Comment:**

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III. HUMAN HEALTH IMPAIRMENT (TCAO FINDINGS 25-28; DTR §§ 25-28)

B. Human Health Impairment Analysis’ Tier II Exposure Parameter Assumptions Regarding Fractional Intake Are Overly Conservative (TCAO Findings 26, 28; DTR §§ 26.1, 28.2.2.1)

4. Tier II Exposure Duration Assumption of 30 Years is Overly Conservative and Unsupported (TCAO Finding 28; DTR §§ 28.2.2, 28.2.2.1; DTR Table 28-7)

The DTR’s human health impairment Tier II analyses utilizes an exposure duration assumption as one component of the model used to estimate human exposure to contaminants in fish and shellfish collected at the Site. (DTR, p. 28-12.) The DTR assumes an exposure duration of 30 years for both types of receptor anglers. (DTR, Table 28-7.)

Expert Dr. Finley succinctly criticizes this exposure duration assumption:

The RWQCB used the highest EPA default point estimate for exposure duration with no discussion, no explanation, and no justification. The RWQCB could have reviewed local census or creel angler data to develop a more accurate and site-specific estimate. They also could have explored alternative (and lower) default EPA estimates or used a distribution of estimates. Current EPA guidance recommends using an estimate of 9 years, which represents the 50th percentile (USEPA 1997a). The studies that this value are derived from reported average exposure duration times ranging from 4.6 years to 12 years (Israeli and Nelson 1992; Johnson and Capel 1992; U.S. Bureau of the Census 1993). It should be noted that the EPA is currently proposing that the default average duration be lowered to 8 years (USEPA 2009). It does not appear that the RWQCB reviewed or considered any of this information.

(Finley 3/11/11 Expert Report, at p. 21) (emphasis added.)

Although that EPA-recommended 9 year period was posed to Mr. Alo during his deposition, he indicated he was not aware of that guidance, and defended (without explanation) the use of a 30 year period as a “reasonable duration rate.” (Alo Deposition, Vol. I, at 145:21-



147:11.) Moreover, Mr. Alo confirmed that the Cleanup Team lacks any site-specific data that would justify the use of a 30 year exposure duration period:

22 Q. Do you have any site-specific data that they  
23 would consume a whole fish and a whole lobster daily for  
24 30 years?  
25 A. No.

(Alo Deposition, Vol. I, at 121:22-25.)

9 Q. So with this site-specific study on San Diego  
10 Bay, is it unrealistic or overly conservative to assume  
11 that someone fishes every day at the shipyard for 30  
12 years?  
13 MR. CARRIGAN: Incomplete hypothetical.  
14 THE WITNESS: Yes.

(Alo Deposition, Vol. I, at 144:9-14.)

In sum, there is no reasonable or justifiable basis for the DTR's use of a 30 year exposure duration assumption in the Tier II human health impairment analysis. The DTR's resulting risk assessment for the Site is significantly overstated.

**Comment ID:** 129

**Organization:** BAE Systems

**DTR Section:** 30.1, 30.2, 35.3

**Comment:**

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IV. NATURAL RECOVERY IS NOT PROPERLY ACCOUNTED FOR IN REMEDY SELECTION (TCAO FINDINGS 30, 35; DTR §§ 30.1, 30.2, 35.3)

Finding 32 acknowledges that natural recovery has been a successful component of cleanup actions in San Diego Bay, yet the preliminary remedial design described in Finding 35 fails to allow for the effect of natural recovery at the Site. Currently available data from the BAE shipyard demonstrates that natural recovery is occurring, and its rate should be incorporated into remedy selection.

**Comment ID:** 130

**Organization:** BAE Systems

**DTR Section:** 4.3, 4.7, 30, 32.7, 34.4

**Comment:**

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IV. NATURAL RECOVERY IS NOT PROPERLY ACCOUNTED FOR IN REMEDY SELECTION (TCAO FINDINGS 30, 35; DTR §§ 30.1, 30.2, 35.3)

A. Source Control Issues Affect All Potential Primary Remedies (TCAO Findings 30, 32, 34; DTR §§ 4.3, 4.7, 30, 32.7, 34.4)

David Barker was designated as and deposed in his capacity as the “person most knowledgeable” for the Cleanup Team regarding alternative remedies analyses, including monitored natural attenuation. (Barker Deposition, Vol. II, at 255:19-256:1.) The DTR states that natural recovery is one of the “readily employable and proven remediation strategies.” (DTR, § 30.1.) Mr. Barker agrees with that statement. (Barker Deposition, Vol. II, at 262:23-263:1.) Natural recovery was not selected as the primary remedy for the Site because “[c]omplete control of site sources has not been fully demonstrated to a level that would assure adequate rates of recovery.” (DTR, at p. 30-3.) However, Mr. Barker testified that recontamination from off-site sources would affect all potential remedies:

6 Q. If we have off-site sources that are continuing  
7 to contaminate a site, it will continue to contaminate  
8 the site whether we do natural recovery, dredging,  
9 capping, or any other remedy; right?

10 A. Right. That's correct. Yeah.

11 Q. I'm having trouble understanding how that could  
12 influence a decision on which remedy to select.

13 A. Oh, you're having trouble where there are  
14 off-site sources?

15 Q. Why that would favor any type of dredging. For  
16 example -- I'll give you an example. If you dredge the  
17 site and there's recontamination, then you may simply  
18 have to dredge it again.

19 A. Yes.

20 Q. So that would be an ineffective remedy and you'd  
21 have remedy failure.

22 A. Yeah.

23 Q. So if you choose capping, as is the case with  
24 Convair Lagoon, where sources weren't controlled and  
25 there's additional pollution on top of the cap, there's  
278

1 further remediation necessary.

2 A. Yes.

(Barker Deposition, Vol. II, at 278:6-279:2.)

Thus, the perceived source control issue is not a factor that should favor one potential remedy over another. And, as discussed below, available recent data indicates natural attenuation is actively occurring at the site.

**Comment ID:** 131

**Organization:** BAE Systems

**DTR Section:** 30.1, 30.2, 35.3

**Comment:**

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IV. NATURAL RECOVERY IS NOT PROPERLY ACCOUNTED FOR IN REMEDY  
SELECTION (TCAO FINDINGS 30, 35; DTR §§ 30.1, 30.2, 35.3)

B. 2009 NOW Data Evidences Natural Attenuation is Actively Occurring (TCAO Findings 30, 35; DTR §§ 30.1, 30.2, 35.3)

In July of 2009, a supplemental triad study was conducted at the site evaluating five stations that had previously been sampled during the 2001/2002 period by Exponent. This supplemental study is often referred to as the “NOW” testing. The NOW results are shown in DTR Table 32-22.

At his deposition Mr. Barker was shown tables summarizing and comparing the data from the 2001/2002 investigation to the NOW data for the five primary constituents of concern ("COC"). (Barker Deposition, at 318-333; Exs. 1227, 1228.) Comparison of these two data sets shows that the concentrations of all such COCs have decreased over the period between 2001/2002 and the July 2009 NOW testing. Concentrations of copper have decreased from 183.3 to 167.8 mg/kg, corresponding to a rate of 1.1% per year (8.5% total decrease). Concentrations of mercury have decreased from 1.5 to 0.8 mg/kg, corresponding to a rate of 7.9% per year (49% total decrease). Concentrations of total PCB congeners have decreased from 247 to 188.7 µg/kg, corresponding to a rate of 3.4% per year (23.6% total decrease). Concentrations of HPAH have decreased from 2,823.4 to 2,293.3 µg/kg, corresponding to a rate of 2.6% per year (18.8% total decrease). Concentrations of TBT have decreased from 82.1 to 23.3 µg/kg, corresponding to a rate of 16.7% per year (71.6% total decrease). (Id.)

**Comment ID:** 132

**Organization:** BAE Systems

**DTR Section:** 30.1, 30.2, 35.3

**Comment:**

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IV. NATURAL RECOVERY IS NOT PROPERLY ACCOUNTED FOR IN REMEDY SELECTION (TCAO FINDINGS 30, 35; DTR §§ 30.1, 30.2, 35.3)

C. 2010 AMEC Data Evidences Natural Attenuation is Actively Occurring (TCAO Findings 30, 35; DTR §§ 30.1, 30.2, 35.3)

Data from the surface sediment sampling conducted by AMEC [Footnote 8 - The Cleanup Team is in the process of adding to the administrative record the AMEC Earth and Environmental Final Technical Report, Pre- and Post-Dredge Sediment Survey for BAE Systems San Diego Ship Repair, Inc., San Diego Bay, San Diego, California, March 2011.] prior to the dredging of the Pride of San Diego dry dock sump can be compared to the data presented by Exponent (2003) in the same area. The spatial coverage of the two data sets is not identical, but the data sets can be compared using only data from the spatial extent common to the two data sets. Specifically, data from Exponent stations SW03, SW06, SW07, SW10, SW11, SW12, SW15, SW18, SW19, SW25, SW26, SW27, SW30, SW31, SW32, SW33, SW34, and SW36 are in the same area as the locations sampled by AMEC.

PCBs were measured as Aroclors, homologs, and a subset of congeners in the 2001 data set, but only a more limited subset of PCB data, namely congeners, was measured in 2010. Therefore changes in PCB concentrations can only be evaluated using the sum of congeners. The list of

congeners analyzed in the two studies is almost identical, however, so use of the sum of congeners is appropriate for evaluating the rate of natural recovery.

Comparison of these two data sets shows that the median concentrations of all COCs have decreased over the period between 2001 and 2010 (the median is used for this comparison because it is a more stable measure of central tendency than the mean). Concentrations of copper have decreased from 170 to 160 mg/kg, corresponding to a rate of 0.7% per year (5.9% total decrease). Concentrations of mercury have decreased from 0.75 to 0.66 mg/kg, corresponding to a rate of 1.4% per year (12% total decrease). Concentrations of total PCB congeners have decreased from 200 to 44.5 µg/kg, corresponding to a rate of 17% per year (77.7% total decrease). Concentrations of HPAH have decreased from 4,450 to 1,843 µg/kg, corresponding to a rate of 9.8% per year (58.6% total decrease). Concentrations of TBT have decreased from 51 to 12 µg/kg, corresponding to a rate of 16 percent per year (76.5% total decrease).

The consistent decreases in concentrations of COCs in surface sediment, and the relatively high rate of decrease of PCBs, indicate that natural recovery is occurring in sediment of the Site. The CAO should therefore take natural recovery into account when establishing the cleanup footprint and during remedy selection. Given sufficient time, natural attenuation could be an appropriate remedy to reach the alternative cleanup levels set forth in the TCAO. Furthermore, given the decreased median concentrations of all COCs that have occurred over the last nine years, the risks to the beneficial uses of the Bay now are less than the risks calculated using the earlier 2001 gathered data than those expressed in the TCAO and DTR. Therefore, the remedial cleanup levels and resultant remedial footprint as expressed in the TCAO and DTR are more conservative than necessary to adequately protect the Bay's beneficial uses.

**Comment ID:** 133

**Organization:** NASSCO

**DTR Section:** 36.1.2

**Comment:**

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NOTE NASSCO'S COMMENTS No. 12 AND No. 13 ARE CONTAINED HEREIN

## II. REGULATORY FRAMEWORK

### A. California Porter-Cologne Water Quality Control Act (Finding 36)

#### II.A.2. Water Code Section 13304 Allows Dischargers To Cleanup or Abate The Effects Of Wastes [Comment No. 12, TCAO, at 36, DTR, at 36.1.2]

Further, under such circumstances, Section 13304, which requires a discharger to “cleanup or abate the effects of the waste,” provides that wastes need not be cleaned up if the effects can be abated, and implicitly acknowledges that cleanup levels can and should be based on site-specific science and risk assessments. [Comment No. 13, TCAO, at 36, DTR, at 36.1.2]. In light of these parameters and for the reasons discussed in detail below, active remediation at the NASSCO shipyard, as described in the TCAO and DTR, is not supported by the record.

**Comment ID:** 134

**Organization:** NASSCO

**DTR Section:** 30, 31.1, 32.1, 32.7, 36.4

**Comment:**

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NOTE NASSCO'S COMMENTS No. 14 AND No. 15 ARE CONTAINED HEREIN

## II. REGULATORY FRAMEWORK

II.B. State Water Resources Control Board Resolution No. 92-49: Policies and Procedures For Investigation and Cleanup and Abatement or Discharges Under Water Code Section 13304 (Findings 30-32, 36)

1. The Board Must Consider The Totality Of Factors Affecting Water Quality In Selecting Cleanup Levels Under Resolution No. 92-49, Including Economic And Technological Feasibility [Comment No. 14, TCAO, at 30-32, 36 DTR, at 30, 31.1, 32.1, 32.7, 36.4]

Resolution 92-49 provides guidance to Regional Boards concerning the application of Water Code Section 13304. The State Board has described the analysis required by Resolution 92-49 as follows:

Resolution 92-49 directs the RWQCBs to ensure that water affected by an unauthorized release attains either background water quality or the best water quality which is reasonable if background water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background . . . any such cleanup level shall (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less stringent than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

See Resolution 92-49, at III. G. See also, In the Matter of the Petition of Unocal Corporation, State Board Order No. WQ 98-12, at 2 (quoting Resolution 92-49); In the Matter of the Petition of Landis Incorporated, State board Order No. WQ 98-13, at 2 (same); In the Matter of the Petition of Unocal Corporation, Order No. 99-10, at 2; In the Matter of the Petition of Chevron Pipe Line Company, State Board Order No. WQ 2002-0002; In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, at 4.

Further, the text of Resolution 92-49 requires an analysis of cost-effectiveness and technological and economic feasibility in determining cleanup levels. See Resolution 92-49, at 6-7 (“The Regional Water Board shall . . . ensure that dischargers shall have the opportunity to select cost-effective methods for . . . cleaning up or abating the effects [of wastes discharged and] . . . require the discharger to consider the effectiveness, feasibility, and relative costs of applicable alternative methods for investigation, cleanup and abatement.”) (emphasis added). For the reasons discussed below, active remediation is not economically or technologically feasible within the meaning of Resolution 92-49; rather, monitored natural attenuation is the appropriate remedial alternative considering the demands being made and to be made on the waters at the Site, and the total values involved—beneficial and detrimental, economic and social, and

tangible and intangible. [Comment No. 15, TCAO, at 30-32, 36, DTR, at 30, 31.1, 32.1, 32.7, 36.4]

**Comment ID:** 135

**Organization:** BAE Systems

**DTR Section:** 30, 32, 25

**Comment:**

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IV. NATURAL RECOVERY IS NOT PROPERLY ACCOUNTED FOR IN REMEDY SELECTION (TCAO FINDINGS 30, 35; DTR §§ 30.1, 30.2, 35.3)

D. Natural Attenuation Is Likely to Achieve The TCAO's Proposed Cleanup Levels in a Reasonable Time Without Active Dredging (TCAO Findings 30, 32, 35; DTR §§ 30, 32, 25)

Pursuant to State Water Board Resolution 92-49, the Regional Board has prescribed alternative cleanup levels for the Site to protect aquatic life, aquatic-dependent wildlife, and human health beneficial uses. (TCAO, Finding 32.) Those levels are set forth in Table 2. (TCAO, at p. 15.) On a SWAC basis, comparison of the alternative cleanup levels for the five primary COCs to the levels reflected by the recent AMEC data reflects the results of natural attenuation at the Site:

[ Table displaying five primary COCs, Alt. Cleanup Level, and AMEC Data ]

The data from AMEC reflects significant decreases since the 2001/2002 timeframe. For the stations sampled by AMEC, four of the five primary COCs are below the post-remedial SWAC levels, while copper is negligibly above. This data suggests that the alternative cleanup levels prescribed by the Regional Board will be achieved within a reasonable time without active dredging.

That conclusion is in accord with recent expert opinion presented by Environ. [Footnote 9 - Expert Report of Environ entitled Comparison of 2001-2002 and 2011 Chemical Conditions in Surface Sediment at the San Diego Shipyard Sediment Site, dated and submitted to the Regional Board on March 11, 2011 (the "Environ 3/11/11 SWAC Expert Report").] Analyzing grab-samples obtained by AMEC at the BAE leasehold, Environ concludes that

concentrations of the five primary COCs in surface sediment have decreased 24 to 76%. Extrapolation of the proportionate decreases to the entire Site suggests that current (2011) Site-wide SWACs are below Site-specific risk-based sediment management criteria set by [the Regional Board] (2010) for restoration of aquatic dependent wildlife and human health Beneficial Uses. Thus, active remediation via dredging to meet chemical risk-based goals to address aquatic dependent wildlife and human health Beneficial Use Impairment is not required. Furthermore, 2011 results indicate natural recovery processes and/or source control may be sufficient to support a Monitored Natural Recovery management approach for addressing aquatic dependent wildlife and human health BUIs at the Site.

(Environ 3/11/11 SWAC Expert Report, at p. 5.)

While the only data available to evaluate whether natural attenuation is occurring is for samples outside the remedial footprint, it can be reasonably extrapolated that the same or greater natural attenuation is occurring within the shipyard areas designated for remediation. At a minimum, natural attenuation should be considered in evaluating the robustness of the remediation required. The remedial footprint as set forth in the TCAO and DTR does not adequately take into account the natural attenuation that has occurred. Furthermore, the evidence of natural attenuation demonstrates that, given the technical and economic feasibility factors of State Water Board Resolution 92-49, natural attenuation is an appropriate remedy for the Site.

**Comment ID:** 136

**Organization:** NASSCO

**DTR Section:** 18.4

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

c. The Benthic Community Assessment Shows That Shipyard Sediments Are Not Causing Impacts To Aquatic Life (Findings 14- 20)

(1) The Benthic Community Analysis Shows That The Number Of Organisms In Shipyard Sediments Is Not Significantly Different From Reference (Findings 14, 15, 16, 18, 20)

Comment No. 117-120

The benthic community analyses indicate that the assemblage of organisms in Site sediments is not significantly different from reference. DTR, Table 18-12; Ginn Report, at 34. [Comment No. 117, TCAO, at 18, DTR, at 18.4]. If substantial alterations of benthic communities were occurring, one would expect to see sparse communities, comprised of the few organisms and taxa able to tolerate chemical toxicity; however, such conditions were not observed at any of the NASSCO stations. Exponent Report, at 8-38. [Comment No. 118, TCAO, at 18, DTR, at 18.4]. Instead, communities at the Site are similar to communities in reference areas. Exponent Report, at 8-8; Ginn Report, at 34. [Comment No. 119, TCAO, at 18, DTR, at 18.4]. Of particular note, the number of crustaceans, which are known to be especially sensitive to sediment pollutants, are present in similar percentages at Site and reference stations, and the overall abundance of benthic macroinvertebrates in Site and reference stations are not statistically different. Ginn Report, at 33-34. [Comment No. 120, TCAO, at 18, DTR, at 18.4]

**Comment ID:** 137

**Organization:** NASSCO

**DTR Section:** 18.4

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

c. The Benthic Community Assessment Shows That Shipyard Sediments Are Not Causing Impacts To Aquatic Life (Findings 14- 20)

(2) The Benthic Community Analysis Shows That The Types Of Organisms In Shipyard Sediments Is Not Significantly Different From Reference (Findings 14-18)

Comment No. 121-123

The benthic community analyses indicate that the number of taxa in Site sediments is not significantly different from reference. DTR, at Table 18-12. The only station to show statistically significant differences from reference with respect to number of taxa is NA22. [Comment No. 121, TCAO, at 18, DTR, at 18.4]. As discussed above, the number of taxa at NA20 was incorrectly identified as statistically different, despite falling within the reference range. Id. [Comment No. 122, TCAO, at 18, DTR, at 18.4]. Accordingly, with the minor exception of NA22, which is not part of the cleanup footprint, none of the stations at NASSCO differed significantly from reference in terms of number of taxa. Id. [Comment No. 123, TCAO, at 18, DTR, at 18.4].

**Comment ID:** 138

**Organization:** NASSCO

**DTR Section:** 18.4

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

c. The Benthic Community Assessment Shows That Shipyard Sediments Are Not Causing Impacts To Aquatic Life (Findings 14- 20)

(3) Sediment Profile Images Confirm That The Benthos Is Mature And Thriving (Findings 14-20)

Comment No. 124



Photographs of sediments at the Site provide additional direct confirmation that the benthos is mature and thriving. Exponent Report, at 8-5. In addition to benthic community analyses, sediment profile images were collected throughout the Site and at reference stations. Exponent Report, at Appendix A. These photographs confirm the presence of mature benthic communities at the Site, and refute Staff's conclusions that benthic macroinvertebrates at the Site are impaired. [Comment No. 124, TCAO, at 14-16, 18, 20, DTR, at 14, 16, 18.1, 18.4, 18.5, 20]

**Comment ID:** 139

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

On March 11, 2011, San Diego Coastkeeper submitted the Expert Report of Donald D. MacDonald, of MacDonald Environmental Sciences, Ltd., entitled Review and Evaluation of Tentative Clean-up and Abatement Order (No. R9-2011-001) for the Shipyard Sediment Site, San Diego Bay, San Diego, California (the "MacDonald 3/11/11 Expert Report"). BAE Systems responds to the comments and conclusions of said report contained in Section "C" entitled "Expert Opinion #1: Proposed Remedial Footprint" which states:

The Proposed Remedial Footprint does not include all of the polygons that meet the requirements for clean-up according to the methodology described in the DTR. Therefore, the Proposed Remedial Footprint should be expanded to include all of the polygons that meet the selection criteria.

The responses to comments that are provided in the following sections show that, contrary to the assertion by MacDonald, the remedial footprint identified in the TCAO does meet the requirements of cleanup according to the methods described in the DTR. Therefore, there is no technical justification for expanding the footprint to include additional polygons.

**Comment ID:** 140

**Organization:** NASSCO

**DTR Section:** 18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

d. The TCAO Is Overly Conservative Because The CUT Did Not Adjust For Multiple Comparisons With The Reference Pool (Findings 15, 16, 18)

Comment No. 125-127

Staff's failure to adjust for multiple statistical comparisons is excessively conservative because it increases the probability of false-positive results. Ginn Report, at 51. As a result, some of the apparently significant results for toxicity and benthic community comparisons in the DTR may be erroneous, since failure to adjust for multiple comparisons across 15 comparisons for each toxicity and benthic community metric at NASSCO results in a 54% probability that at least one apparently significant result will occur as a result of chance alone. Id. [Comment No. 125, TCAO, at 18, DTR, at 18, Appendix 18]. Considering that only one station at NASSCO showed apparently significant differences from reference in the amphipod toxicity test, and only four stations (aside from NA22) showed apparently significant differences from reference in the bivalve larvae test under the DTR analysis, the overall triad results could be substantially affected if any of those hits were simply due to chance. Id. [Comment No. 126, TCAO, at 18, DTR, at 18]. This degree of "conservatism" is unwarranted, and extends beyond any reasonable or scientifically accepted means of achieving protectiveness. [Comment No. 127, TCAO, at 15, 16, 18, DTR, at 15, 16, 18].

**Comment ID:** 141

**Organization:** BAE Systems

**DTR Section:** 33, Appendix for Section 33, Table A33-3

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald's Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

1. Comment C.2.1 that "The sampling density is insufficient to accurately characterize the nature and extent of contamination at this type of site" Is Incorrect (DTR § 33; DTR Appendix for Section 33, TableA33-3)

The DTR presents analyses of information collected at 60 stations at the Site in 2001/2002 by Exponent (2003). Comment C.2.1 of MacDonald 3/11/11 Expert Report states "The sampling density is insufficient to accurately characterize the nature and extent of contamination at this type of site."

MacDonald states that "sediment sampling conducted at the Shipyards Sediment Site was inadequate to accurately characterize the nature and extent of sediment contamination." This assertion is incorrect. The station distribution scheme was consistent with the manner in which most schemes are designed at contaminated sediment sites. Stations are distributed with the highest density near sources where the highest COC concentrations are expected (especially in depositional environments), and with lower densities in areas removed from the sources, where contaminants are expected to be more widely dispersed by waves and currents. In fact, MacDonald described such a station distribution scheme when he stated that "to address

concerns regarding spatial variability in sediment chemistry, investigators frequently design sediment sampling programs to provide a high density of samples in the vicinity of point source discharges of contaminants."

At the Shipyard Sediment Site, it was expected that most contaminant sources would be located near the shoreline, and that the piers would create depositional environments that would facilitate deposition of contaminants near the sources, resulting in patchy distributions with elevated concentrations. In contrast, contaminant sources were not expected to be found outside the pier lines, and in those locations, contaminants would be expected to be dispersed by waves and currents in San Diego Bay, and their concentrations in sediments would be lower and more evenly distributed. Therefore, 43 of the 65 stations sampled at the Site in 2001/2002 were located within the pier line of the site, as estimated by the property boundaries presented in Attachment 1 of the TCAO. This area encompasses approximately 63 acres (See Sections 2.3.1 and 3.3.1 of the DTR). The station density within the pier line (i.e., where contaminant deposition would be expected to be greatest) was therefore 0.69 stations per acre, which is approximately 2.7 time greater than the station density outside the pier line (i.e., 0.26 stations per acre), where contaminants would be expected to be dispersed by waves and currents in San Diego Bay. Therefore, the station distribution scheme used at the Site was consistent with the scheme commonly used at contaminated sediment sites.

The sediment chemistry results of the 2001/2002 sampling at the Site confirmed the assumptions used to design the station distribution scheme. The chemical concentrations presented in Table A33-3 of the DTR and the concentration contours presented in Figures 4-3 to 4-21 of Exponent (2003) show that in general, the highest concentrations were found within the pier line and lower, more evenly distributed concentrations were found outside the pier line. Therefore, the station distribution scheme used at the Site is sufficient to characterize the nature and extent of sediment contamination.

There are no firm rules or agency guidance on the number of stations that should be sampled at a contaminated sediment site, because each site is unique. The number used to characterize a particular site is usually determined using the best professional judgment of the scientists, regulatory staff, and responsible parties involved with the site. These decisions take into account the site-specific nature of sources and transport mechanisms, and the effort and costs involved in both the site investigation and potential cleanup actions. This was the process used to develop the station distribution scheme for the Site. Therefore, the station densities used at the Site are considered sufficient to characterize the nature and extent of sediment contamination, and to develop a remedial footprint.

**Comment ID:** 142

**Organization:** NASSCO

**DTR Section:** 18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

e. Under The CUT's Triad Approach, Shipyard Sediments Generally Show "Low" Likelihood Of Impacts On Aquatic Life (Findings 14–20)

Comment No. 128-131

Despite the aforementioned structural biases that skew Staff's decision framework in favor of finding impacts on aquatic wildlife at the Site, Site sediments still generally show "low" likelihood of impacts on aquatic life under Staff's triad approach. [Comment No. 128, TCAO, at 18-20, DTR, at 18-20]. For example, Staff has concluded that the health of the benthic community is "unlikely" to be adversely impacted by Site sediments at a majority of NASSCO stations (8 of 15), and is either "possibly" or "likely" impacted at only 5 and 2 stations, respectively. DTR, at Table 18-1. [Comment No. 129, TCAO, at 18, DTR, at 18.1, 18.4, 18.5].

Moreover, as discussed in detail above, Staff's benthic community analysis—which is the most direct evidence of impacts to benthic macroinvertebrates—categorized 13 of 15 stations at NASSCO as having only a "low" likelihood of benthic community degradation, even under Staff's extremely conservative framework. Id.; see also Ginn Report, at 44-45 (concluding that these stations actually present "no" likelihood of adverse effects, due to the lack of significant difference from reference conditions for all benthic community metrics and the mature benthic communities observed). [Comment No. 130, TCAO, at 18-20, DTR, at 18.1, 18.4, 18.5, 19, 20].

NASSCO appreciates Staff's efforts to ensure that the TCAO is adequately protective of aquatic life beneficial uses; however, Staff's framework is replete with excessively conservative assumptions and structural biases towards finding impairment to aquatic life. As a result, the conclusions in the TCAO are not reflective of the true condition of the Site, and lead to an overly conservative result, which should instead have been based upon a realistic site-specific risk assessment, as is required under Section 13304 and Resolution 92-49. [Comment No. 131, TCAO, at 14-20, DTR, at 14-20].

**Comment ID:** 143

**Organization:** NASSCO

**DTR Section:** 24

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

Comment No. 132-134

The TCAO concludes that aquatic-dependent wildlife uses (Wildlife Habitat (WILD); Preservation of Biological Habitats of Special Significance (BIOL); and Rare, Threatened, or Endangered Species (RARE)) in San Diego Bay are impaired “due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site.” TCAO, at ¶ 21.

As noted above, however, the results of the sediment investigation indicate that, although contaminants of concern and other pollutants are present in Site sediments in elevated concentrations relative to reference, they do not pose risks to aquatic wildlife because they are not bioavailable, and because many constituents do not bioaccumulate. [Comment No. 132, TCAO, at 19, 21-24, DTR, at 19, 21-24].

By the same token, the two-tier risk assessment conducted for aquatic-dependent wildlife was overly conservative, employed unrealistic assumptions, and did not comply with relevant state and federal guidance in the process of concluding that “ingestion of prey items . . . within all four assessment units at the Shipyard Sediment Site poses an increased risk above reference to all receptors of concern (excluding the sea lion) . . . [including] BAP, PCBs, copper, lead, mercury, and zinc.” TCAO, at ¶ 24. [Comment No. 133, TCAO, at 21-24, DTR, at 21-24]. For the reasons set forth below, the TCAO and DTR should have concluded that sediment at the Shipyard Sediment Site poses no significant risk to aquatic-dependent wildlife. [Comment No. 134, TCAO, at 21-24, DTR, at 21-24].

**Comment ID:** 144

**Organization:** NASSCO

**DTR Section:** 24.2.2

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

a. Regional Board Staff’s Analysis Employs Assumptions That Are Overly Conservative And Unrealistic, And Bias The Results

Comment No. 135-148

In the process of conducting a Tier-II risk analysis, Staff made several assumptions that were overly conservative and biased the results of the analysis in a way that preordained the conclusion that aquatic-dependent wildlife uses were impaired by Shipyard sediment. [Comment No. 135, TCAO, at 24, DTR, at 24].

First, Staff assumed an area use factor (“AUF”) of 1.0 for all receptors. This means that Staff assumed that the six receptors of concern—including the California least tern, California brown pelican, Western grebe, Surf scoter, California sea lion, and East Pacific green turtle—all derived 100% of their diet from prey obtained from the Shipyard. DTR, at Section 24.2.2, Table 24-6. This assumption is wholly unrealistic for all six receptors, and significantly magnified the hazard quotient for every single receptor. Not only are the home ranges of all six species substantially greater than the 43 acre NASSCO Shipyard area, but also it defies belief that any receptor would choose to only forage an active industrial Shipyard where the habitat quality is low for all six indicator species. See Ginn Report, at 59-61. [Comment No. 136, TCAO, at 24, 32, DTR, at 24.2.2-24.2.4, 24.2.6, 32.2, Appendix 24].

As demonstrated in Table 6 of the Ginn Report, by assuming that the 43 acre NASSCO leasehold was the entire forage area of the six receptor species, as opposed to choosing the available habitat within San Diego Bay, the Staff ensured that the maximum hazard quotient for every receptor was well over 1.0. In contrast, using a realistic assumption of forage area based on San Diego Bay Habitat demonstrates that no hazard quotient would be over 0.20, well below 1.0. Accordingly, the TCAO/DTR conclusion that aquatic-dependent wildlife are impaired from sediment contamination at NASSCO is driven by this single policy decision. [Comment No. 137, TCAO, at 21-24, 32.2, DTR, at 21-24, 32.2].

Furthermore, Staff’s failure to consider the actual AUF for the six indicator species did not comport with U.S.E.P.A. or California Department of Toxic Substances Control guidance documents on how to perform an ecological risk assessment. Ginn Report, at 61-63. Nor did Staff rely on any studies, guidelines, or agency documents when it made this policy decision, or conduct any study of its own to determine the actual use of the six receptors at the NASSCO Shipyard. Alo Depo, at 333:11-334:2; 345:8-346:13. [Comment No. 138, TCAO, at 24, DTR, at 24.2]. Accordingly, not only did Staff’s resolve to utilize an AUF of 1.0 lead to the conclusion of impairment, but also it was an arbitrary policy decision, which neither comports with realistic assumption nor standard ecological risk assessment guidance. Therefore, it is an arbitrary and capricious determination in the TCAO and DTR that should be reversed, and aquatic-dependent wildlife conclusions reworked. [Comment No. 139, TCAO, at 24, DTR, at 24.2, Appendix 24].

**Comment ID:** 145

**Organization:** BAE Systems

**DTR Section:** 33.1.2, Table 33-1. Tables A33-1, A33-2, A33-3

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald’s Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

2. Comment C.2.2 that “The Composite SWAC Ranking Value provides a consistent, but incomplete, basis for ranking polygons for inclusion in the Proposed Remedial Footprint” is

Incorrect (DTR § 33.1.2, DTR Table 33-1; DTR Appendix for Section 33, Tables A33-1, A33-2 and A33-3)

The DTR used Composite SWAC Ranking Values as one line of evidence for identifying polygons to include in the remedial footprint at the Site. Comment C.2.2 of MacDonald 3/11/11 Expert Report states that “The Composite SWAC Ranking Value provides a consistent, but incomplete, basis for ranking polygons for inclusion in the Proposed Remedial Footprint.”

MacDonald states that “the index does not consider the concentrations of other contaminants that could be elevated in sediments from the site. Specifically, lead, zinc, low molecular weight (L)PAHs all exceed toxicity thresholds in surficial sediments at one or more sampling stations.” MacDonald then refers the reader to Table A33-3 of the DTR. Because LPAH is not addressed in Table A33-3, the basis of his assertion with respect to that group of chemicals is unclear. Also, MacDonald does not identify which toxicity thresholds he is referring to when he states that they were exceeded, so the basis of that assertion is also unclear. However, if 60% LAETs are calculated from the LAETs for lead and zinc presented in Table 9-10 of Exponent (2003), the resulting values of 150 and 720 mg/kg, respectively, are not exceeded for any of the polygons that are not included within the remedial footprint, as documented in Table 33-3 of the DTR. Therefore, MacDonald’s assertion that lead and zinc exceed toxicity thresholds outside of the remediation footprint is untrue based upon site-specific thresholds calculated in a manner consistent with how the thresholds for the primary COCs were calculated.

In addition to the fact that lead and zinc did not exceed their estimated 60% LAET values outside the remedial footprint, Section 29.3 of the DTR describes how it was verified that secondary COCs, such as lead and zinc, were highly correlated with the primary COCs, to ensure that they would be addressed in a common remedial footprint. Table 29-4 of the DTR shows that both lead and zinc exhibited strong positive correlations with several of the primary COCs. The highest correlations for lead and zinc were found with copper, for which both correlations coefficients were >0.90 (i.e., 0.90 and 0.94, respectively). Therefore, the co-occurrence evaluation conducted in the DTR ensured that the secondary COCs were accounted for in the remedial footprint.

**Comment ID:** 146

**Organization:** BAE Systems

**DTR Section:** 33.1.2 Table 33-1, 33-6, A33-1, A33-2, A33-3

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald’s Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

3. Comment C.2.3 that “The Composite SWAC Ranking Value was not applied consistently to identify polygons for inclusion in the Proposed Remedial Footprint” is Invalid (DTR Tables 33-1 and 33-6; DTR Appendix for Section 33, Tables A33-1, A33-2 and A33-3)

The DTR used Composite SWAC Ranking Values as one line of evidence for identifying polygons to include in the remedial footprint at the Site. Comment C.2.3 of MacDonald 3/11/11 Expert Report states that "The Composite SWAC Ranking Value was not applied consistently to identify polygons for inclusion in the Proposed Remedial Footprint."

MacDonald states the "a total of 15 stations with Composite SWAC Ranking Values higher than 5.5 were not included in the Proposed Remediation Footprint", and that "Table 33-6 fails to provide an explanation for excluding ten polygons with Composite SWAC Ranking Values greater than 5.5 from the Proposed Remediation Footprint." The DTR clearly states on Page 33-1 that "The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentrations for the five primary COCs, sitespecific median effects quotient (SS-MEQ) for non-Triad stations, and highest concentration of individual primary COCs." Therefore the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. The use of a weight-of-evidence approach based on multiple lines of evidence is consistent with the manner in which most sediment quality evaluations are currently conducted in the U.S. by sediment quality practitioners (e.g., Burton et al. 2002a,b; Chapman and Anderson 2005; Chapman et al. 2002; Forbes et al. 2004, SFF 2007; Weisberg and Bay 2011), and therefore was considered appropriate for use at the Site (see Section 15 of the DTR).

As shown in Table 33-1 of the DTR, the 23 polygons with the highest Composite SWAC Ranking Values were included in the remedial footprint (see third column of the table), and all of those polygons had values of 7.6 or greater. As an example, Polygon NA09 was added to this group primarily because it had the 10th highest concentration of mercury (i.e., a primary COC) of all the polygons (see Table 33-4 of the DTR). Therefore, the SWAC Value of 5.5 was not the primary line of evidence used to include NA09 in the remedial footprint, and a SWAC Value of 5.5 was not used as a standalone justification for including any polygon in the remedial footprint, as MacDonald's assertion implies. MacDonald's assertion is therefore invalid.

MacDonald also states that the HPAH concentration of Polygon NA07 was listed as 15.85 mg/kg in Table A33-3 of the DTR, that this value exceeds the 60% LAET value of 15.3 mg/kg, and that, as a consequence, the rationale for excluding that polygon from the remedial footprint is based on all COCs being less than 60% LAET values (Table 33-6 of the DTR) is incorrect. MacDonald's statement that the HPAH value for Polygon NA07 is 15.85 mg/kg is correct, and Table 33-6 is, therefore, in error. Nevertheless, the Triad results indicate that NA07 is not likely impaired, with low sediment toxicity and low benthic community effects being found (see Table 33-6 of the DTR). Therefore, it is likely that the bioavailability of the HPAHs are reduced at this location, and the empirical biological results should be given more weight than the bulk sediment chemistry results when deciding whether to include this polygon in the remedial footprint. The decision to not include this polygon in the footprint is therefore justified.

Although MacDonald states that benthic macroinvertebrate data for Polygon NA07 was not included in the database he was provided, benthic data are available for this polygon (see Table 18-1 of the DTR).



**Comment ID:** 147

**Organization:** NASSCO

**DTR Section:** 24

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

b. Direct Evidence Supports The Conclusion That Wildlife Are Not Impaired (Findings 15, 18, 21-24)

Comment No. 149-153

If direct evidence of observed conditions aquatic life uses are not impaired, it also stands to reason that aquatic-dependent wildlife uses also are not impaired. [Comment No. 149, TCAO, at 15, 18, 23, 24, DTR, at 15, 18.4, 23, 24, Appendix 15]. Direct evidence presented in the DTR demonstrates that when compared to reference conditions, the number of fish, crustaceans, polychaetes, mollusks, and other organisms found at the NASSCO Shipyard is not significantly different. See Ginn Report, at 34-35 (Figures 3-4). [Comment No. 150, TCAO, at 15, 18, 23, 24, DTR, at 15, 18.4, 23, 24]. Furthermore, the Exponent Report demonstrates that PCB concentrations in fish and lobsters are higher in reference areas and in the “outside NASSCO” area of the leasehold (furthest from NASSCO’s activities) than within the NASSCO Shipyard. Exponent Report, at Tables 10-2, 10-3, 10-4. [Comment No. 151, TCAO, at 24, 28, DTR, at 24, 28]. As described in Sections IV.A.2, above, there are very good reasons to conclude that aquatic life beneficial uses are not impaired at the NASSCO Shipyard, and the direct evidence to that effect supports that conclusion. [Comment No. 152, TCAO, at 14-20, 28 DTR, at 14-20, 28].

Moreover, it is worth noting that the neither the DTR nor the TCAO cite any studies demonstrating adverse impacts on the California least tern, California brown pelican, Western grebe, Surf scoter, California sea lion, or East Pacific green turtle in San Diego Bay. [Comment No. 153, TCAO, at 21-24, DTR, at 21-24].

**Comment ID:** 148

**Organization:** NASSCO

**DTR Section:** 15,21-24,28

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

c. Any Potential Negative Effects From Shipyard Contaminants Are Not Observed In Fish Beyond The Leasehold (Findings 15, 21-24, 28)

Comment No. 154-161

The DTR employed a weight-of-evidence approach to evaluate the exposure to and potential for adverse impacts from the Shipyard Site. As part of this approach, the DTR analyzed the tissue concentrations of contaminants of concern in fish caught inside the NASSCO leasehold, and compared them to concentrations in fish caught outside the leasehold and in reference conditions in San Diego Bay. DTR, at Table 28-9. The results demonstrated that there was no significant difference in the level of tissue concentrations for contaminants of concern between fish caught inside the NASSCO Shipyard, and at reference areas around San Diego Bay. Finley Report, at 28, 49-50 (Tables 13-14). [Comment No. 154, TCAO, at 21-24, 28, DTR, at 21-24, 28.3]. Rather, mercury in fish captured within the NASSCO leasehold was actually lower than reference conditions, and are not impacted for mercury at unsafe levels. DTR, at Table 28-9; Alo Depo, at 115:13 – 115:21, 116:8 – 116:20, 117:7 – 117:21. [Comment No. 155, TCAO, at 21-24, 28, DTR, at 21-24, 28.3]. In fact, the mercury levels of fillets from fish caught within the leasehold satisfy EPA’s recommended guidance threshold for what constitutes “lower levels of mercury in fish.” Alo Depo, at 116:8 – 116:20. [Comment No. 156, TCAO, at 21-24, 28, DTR, at 21-24, 28.3]. Additionally, the mean chemical concentrations measured in the edible fish tissues collected inside the NASSCO leasehold were not statistically different from those measured outside (but adjacent to) the leasehold. Finley Report, at 28-29, 50. Similarly, the mean chemical concentrations in fish caught outside (but adjacent to) the leasehold were not statistically different from those caught at reference stations, which were specifically selected to represent background conditions. Id. Thus, the fish tissue concentrations observed in fish did not vary significantly by location, suggesting that (1) spotted sand bass at the Site are meet regional background conditions and (2) shipyard chemicals do not adversely affect fish inside, or beyond, the leasehold. [Comment No. 157, TCAO, at 21-24, 28, DTR, at 21-24, 28.3].

**Comment ID:** 149

**Organization:** BAE Systems

**DTR Section:** 32.5.2, Table 32-21, 33.1.1, Table 33-2

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald’s Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

4. Comment C.2.4 that “There is insufficient evidence to demonstrate that the SS-MEQ threshold (0.9) provides a reliable basis for

identifying polygons that are ‘Likely’ impacted” is Incorrect (DTR § 32.5.2; DTR Table 32-21; DTR § 33.1.3; DTR Table 33-2)

The DTR identifies a SS-MEQ threshold value of 0.9 for the five primary COCs as one line of evidence for evaluating potential benthic impairment at the Site. Comment C.2.4 of MacDonald 3/11/11 Expert Report states that “There is insufficient evidence to demonstrate that the SS-MEQ threshold (0.9) provides a reliable basis for identifying polygons that are ‘Likely’ impacted.”

MacDonald states that the technical basis for selecting the 0.9 threshold is not presented in Section 32.5.2 of the DTR and that the underlying data with which the reliability calculations were made are not provided. However, the methods used to develop and evaluate the SS-MEQ are clearly described in the text of Section 32.5.2 of the DTR, and all of the related underlying data are presented in Table A32-11 of the DTR. As McDonald correctly noted, the data presented in Table 32-21 of the DTR show that a threshold value of 0.9 has an overall reliability of 70 percent, which was erroneously stated as 73 percent in the text of Section 32.5.2 of the DTR. The reduction in reliability of 3 percent is not statistically meaningful nor does the reduction diminish the SS-MEQ as a reliable basis for identifying polygons that are “likely” impacted.

The other measures of predictive reliability of the SS-MEQ threshold of 0.9 presented in Tables 32-21 and A32-11 of the DTR show that the threshold is biased toward being environmentally protective. Its ability to accurately predict locations that are not “likely impaired” (referred to as non-likely efficiency in Table A32-11 of the DTR) was 94 percent (i.e., 16 of 17 predictions). The only polygon erroneously predicted not to be likely impaired was NA22, which had a SS-MEQ value of only 0.35. However, as stated in Section 32.5.2 of the DTR, there is substantial evidence of non-COC related impairment from physical disturbance in that polygon. The ability of the threshold SS-MEQ of 0.9 to accurately predict “likely impairment” (referred to as likely efficiency in Table A32-11 of the DTR) was only 38 percent (i.e., 5 of 13 predictions). That is, the SS-MEQ threshold of 0.9 predicted impairment at a substantial number of locations without actual impairment (i.e., 62 percent of the stations), as well as stations with impairment.

The predictive reliability results for the SS-MEQ value of 0.9 indicate that there is a very high degree of confidence that polygons with SS-MEQ values less than 0.9 are not likely to be impaired. Therefore, the decision to exclude all polygons with SS-MEQ values less than 0.9 in the remedial footprint is environmentally protective. In contrast, there is much less confidence that polygons with SS-MEQ values greater than 0.9 are likely to be impaired. Therefore, the conservative decision to include all polygons with SS-MEQ values greater than 0.9 in the remedial footprint is also environmentally protective, because over half of those polygons may not be impaired.

Contrary to the assertion of MacDonald that there is insufficient evidence to demonstrate that the threshold SS-MEQ is reliable, the information presented above indicates that the threshold SS-MEQ of 0.9 is an environmentally protective predictor of both the presence and absence of impairment at the Site.

**Comment ID:** 150

**Organization:** NASSCO

**DTR Section:** 28

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

Comment No. 162-163

The TCAO concludes that human health beneficial uses for San Diego Bay (Contact Water Recreation (REC-1); Non-contact Water Recreation (REC-2); Shellfish Harvesting (SHELL); and Commercial and Sport Fishing (COMM)) are impaired “due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site.” TCAO, at ¶ 25.

Although the results of the sediment investigation indicate that contaminants of concern and other pollutants are present in Site sediments in elevated concentrations relative to reference, they do not pose risks to human health because the NASSCO Shipyard is a secured facility that prohibits the public from engaging any of these beneficial uses, fish and shellfish beyond the NASSCO Shipyard do not exhibit elevated levels of Shipyard contaminants, and even if the public were able to catch fish and shellfish in the Shipyard, using well-established and reasonable assumptions to assess risk demonstrates that fish and shellfish from the Shipyard do not pose a threat to human health. [Comment No. 162, TCAO, at 25-28, DTR, at 25-28, Appendix 28].

As observed above for aquatic-dependent wildlife, Staff’s two-tier risk assessment conducted for human health was overly conservative, employed unrealistic assumptions, and did not comply with relevant state and federal guidance. [Comment No. 163, TCAO, at 27-28, DTR, at 27.2, 28.2]. For the reasons set forth below, there TCAO and DTR should have concluded that sediment at the Shipyard Sediment Site poses no significant risk to human health.

**Comment ID:** 151

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

a. Human Health Cannot Be Impacted From Contamination In Fish Because Fishing Does Not Occur In The Shipyard (Findings 15-28)

Comment No. 164-170

The NASSCO Shipyard is a high-security area due to its work for the U.S. Navy, and is characterized by a lack of public access. In San Diego Bay, a security boom prevents unauthorized vessels from approaching any closer than 300 feet from the Shipyard. Expert Report of Brent L. Finley, Prepared in Regards to the California Regional Water Quality Control Board's Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 (San Diego Bay) (March 11, 2011) ("Finley Report"), at 4. From the shore, unauthorized personnel are prohibited from accessing the Shipyard by security guards, buildings, eight foot fences with razor wire, video surveillance, and alarm systems, and even approved guests are escorted around the site at all times. *Id.* These security measures absolutely prevent any unauthorized access to the NASSCO Shipyard. [Comment No. 164, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2].

Furthermore, there is no documented instance of any fishing or shellfish collection – beyond that required by the Regional Board as part of the sediment investigation – taking place at the NASSCO Shipyard, and fishing is strictly prohibited at the NASSCO Shipyard. *Alo Depo*, 88:4-7. [Comment No. 165, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2]. Accordingly, there is no justification for the DTR's assertion that "it is possible that NASSCO or BAE Systems employees or U.S. Navy personnel may fish off of the piers, bulkheads, riprap, ships, etc." DTR, at 28-10. [Comment No. 166, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2]. By the same token, although the Environmental Health Coalition has maintained that fishing has taken place at the Shipyards, that assertion is based completely on an unsubstantiated conversation that Ms. Laura Hunter claims to have had with some person at some point over the past twenty years. *Deposition of Laura Hunter ("Hunter Depo")*, at 20:24-22:2; 151:15-153:14. [Comment No. 167, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2].

Furthermore, there is no indication that the security measures at the NASSCO Shipyard will be relaxed any time soon. NASSCO lease with the Port of San Diego continues through the year 2040, and the Port Master Plan indicates that the area is intended to be used as an industrial shipyard for the foreseeable future. *Alo Depo*, at 106-21-107:8. [Comment No. 168, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2]. Furthermore, if at any point in the future the land use plan for the NASSCO Shipyard changed, the Regional Board could at that time determine whether the risk to human health posed by the new land use would change in any way. *Id.* at 107:23-108:6. [Comment No. 169, TCAO, at 27-28, DTR, at 27.2.1, 28.2.2].

Accordingly, it is completely unrealistic to expect that the public will engage in any of the beneficial uses found to be impaired in Finding 25 at the NASSCO Shipyard. [Comment No. 170, TCAO, at 25, 27-28, DTR, at 25, 27-28].

**Comment ID:** 152

**Organization:** NASSCO

**DTR Section:** 28

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

b. Fish Beyond The Shipyard Do Not Exhibit Significantly Elevated Levels Of Shipyard Contaminants And Do Not Present Risks To Human Health Relative To Reference Conditions (Finding 28)

Comment No. 171-172

It would be a concern if fish and shellfish picked up contaminants at the NASSCO Shipyard, and then migrated into areas where they could be caught by San Diego Bay anglers. Accordingly, fish and lobster were caught inside the NASSCO Shipyard and at reference areas around San Diego Bay, and tissue concentrations of contaminants of concern were compared. The results demonstrated that there was no significant difference in the level of tissue concentrations for contaminants of concern between fish caught inside the NASSCO Shipyard, and at reference areas around San Diego Bay. Finley Report, at 49-50 (Tables 13-14). [Comment No. 171, TCAO, at 28, DTR, at 28, Appendix 28]. The fact that fish tissue data collected from the NASSCO Shipyard is no different from tissue data collected from the reference areas “strongly suggests the discharges from the leasehold do not appear to have influenced fish tissue concentrations.” Id. at 28. [Comment No. 172, TCAO, at 28, DTR, at 28, Appendix 28]

**Comment ID:** 153

**Organization:** NASSCO

**DTR Section:** 27

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

c. The Tier I Risk Assessment Employed In the DTR Inappropriately used Macoma Nasuta Tissue (Findings 26, 27)

Comment No. 173-174

The Tier I Risk Assessment conducted by Staff used *Macoma nasuta* tissue from laboratory exposures to conduct the screening level assessment for human health risk. This was inappropriate because an appropriate “surrogate” species should show ecological and physiological similarities to a species that would naturally occur at the Shipyard and be harvested by humans. Ginn Report, at 77-78. [Comment No. 173, TCAO, at 26-27, DTR, at 26, 27.2]. In fact, *Macoma nasuta* is relatively rare at the NASSCO Shipyard, and is not subject to recreational harvesting by humans in California or elsewhere. Id. at 78. [Comment No. 174, TCAO, at 26-27, DTR, at 26, 27.2].

**Comment ID:** 154

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff’s Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Comment No. 175-198

Staff were aware that U.S.E.P.A guidance indicates that Tier II Risk Assessment exposure assumptions “should be based on an estimate of the reasonable maximum exposure (RME) expected to occur under both current and future conditions at the site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.” DTR, at 28-12 (emphasis added). Yet Staff’s Tier II Risk Assessment assumes “that a person will somehow visit the NASSCO leasehold (despite the lack of access from both land and water) and consume fish/shellfish containing the maximum measured concentrations every day for 30 years. This clearly does not fit the definition of a reasonable maximal exposure and is in fact a worst-case screening analysis.” Finley Report, at 9. [Comment No. 175, TCAO, at 28, DTR, at 28.2.2, 28.2.6].

Under the guise of being “conservative,” Staff ignored relevant federal guidance and presented a Tier II Risk Assessment that is based on “a series of high-end, implausible exposure assumptions that do not involve common sense or reasonableness . . . .” Ginn Report, at 80. [Comment No. 176, TCAO, at 28, DTR, at 28]. As explained below, assumptions employed in Staff’s Tier II Risk Assessment flawed it to such an extent that it “does not provide scientifically valid estimates of risk associated with the NASSCO site, and is of no value in making risk management decisions for the site.” Id. at 80-81. [Comment No. 177, TCAO, at 28, DTR, at 28].

The Ginn Report succinctly summarizes four compounding assumptions employed by Staff:

1. All of the fish or shellfish tissue consumed each day comes from the shipyard site (i.e., FI [Fractional Intake] = 1.0)
2. Four percent of the arsenic in seafood is in the inorganic form
3. Risks for subsistence anglers are unrealistic
  - a. The only species consumed are spotted sand bass and spiny lobster.
  - b. The theoretical subsistence angler consumes only the whole-bodies of the fish and invertebrate species
4. Anglers have complete access to the highly-restricted shipyard site.

Ginn Report, at 81. The Finley Report concurs with Ginn's recitation of errors, and identifies several additional compounding errors:

- a) There is no basis for assuming that a subsistence angler would only consume entire fish or shellfish,
- b) The use of maximum chemical concentrations to represent tissue chemical concentrations yields a biased and potentially inaccurate estimate of health risk,
- c) Considering the lack of access and industrial nature of the shipyard leasehold, the use of unmodified fish consumption rates from the Santa Monica Bay Study, which was conducted in a highly accessible recreational area, is inappropriate and inconsistent with EPA guidance,
- d) The assumption that 4% of the measured arsenic in fish/lobster tissue is inorganic is unjustified, and
- e) There is no basis for the assumption of a 30-year exposure duration at this location.

Finley Report, at 22.

**Comment ID:** 155

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

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NOTE NASSCO'S COMMENTS No. 16 THRU No. 26 ARE CONTAINED HEREIN

### III. THE TENTATIVE CLEANUP AND ABATEMENT ORDER RESULTS IN THE DISPARATE TREATMENT OF NASSCO, CONTRARY TO LAW

A. In Violation Of The Mandate Of State Board Resolution 92-49, And Principles Of Due Process And Equal Protection, The Order Would Treat NASSCO Differently Than Similarly Situated Dischargers (Findings 2, 6, 32, 36)

Resolution 92-49 provides that the "Regional Water Board shall . . . prescribe cleanup levels which are consistent with appropriate levels set by the Regional Water Board for analogous discharges that involve similar wastes, site characteristics, and water quality considerations." See also Barker Depo, at 345:12-345:17 (recognizing that a goal of Resolution 92-49 is to ensure that Regional Boards treat similar sites similarly). Principles of due process and equal protection also require both fundamental fairness, and that persons subject to legislation or regulation who



are in the same circumstances be treated alike. U.S. Const. amend. XIV, §1; Cal. Const. art. I, §§ 7, 15.

Over the past decade, the Regional Board has prescribed cleanup levels for sediments at other shipyard and boatyard locations on San Diego Bay with analogous discharges involving similar circumstances as the Site. See e.g., San Diego Regional Board Order Nos. 88-86, 88-78, 89-31, 84-100, 94-101, 94-102, 95-21, 97-63, 99-06, 2001-303, R9-2002-0072. Barker Depo, Ex. 1210 at Exhibit A. However, despite substantial similarities between these sites and NASSCO, the Regional Board now seeks to impose radically more stringent cleanup levels upon NASSCO in departure from prior precedent and in violation of both due process and equal protection principles, and the consistency requirement expressly stated in Resolution 92-49. TCAO, at ¶ 32, DTR, at 32-1. [Comment No. 16, TCAO, at 32, 36, DTR, at 32, 36.4].

#### 1. The Proposed Cleanup Levels Are Unprecedented Compared To Other Sediment Remediation Projects In San Diego Bay (Findings 32, 36)

Although similar sites are required to be treated similarly, Staff has proposed unprecedented cleanup levels for the Site, while setting much less stringent levels at other similarly situated sites. Response to NASSCO's RFAs, at 56. [Comment No. 17, TCAO, at 32, 36, DTR, at 32, 36.4]. Since the early 1990s, the Regional Board has remediated sediments at a number of shipyards, boatyards and other industrial sites in San Diego Bay. Many of these sites, including the Commercial Basin Boatyards, Paco Terminals, Convair Lagoon, and Campbell Shipyard, are similar to NASSCO in many respects, including but not limited to geographical location, water quality considerations, uses, wastes, beneficial uses, and receptors of concern. Barker Depo, at 118:14 – 140:1; 346:25 – 352:15; 354:22 – 361:18; 385:17 – 387:4, 564:25 – 565:23, 567:7 – 567:16; see also Barker Depo, Ex. 1210 at Exhibit A. [Comment No. 18, TCAO, at 32, 36, DTR, at 32, 36.4]. In particular, Campbell and NASSCO have similar physical, biological and chemical conditions, locations, site activities, waste materials and matrices, offsite pollutant inputs, and hydrodynamic and biogeographic zones. Barker Depo, at 362:15 – 365:5. [Comment No. 19, TCAO, at 2, 6, 32, 36, DTR, at 2.3, 6.3, 32, 36.4]. Yet, in spite of these similarities, the cleanup levels proposed for NASSCO are far more stringent than those of the other sites, including Campbell Shipyard, for the same constituents. See e.g., Barker Depo, 365:8 – 365:23. [Comment No. 20, TCAO, at Comment No. 21, TCAO, at 32, 36, DTR, at 32, 36.4].

For example, at Paco Terminals, Campbell Shipyard, and the Commercial Basin Boatyards requiring cleanup, the copper cleanup levels were 1000 mg/kg, 810 mg/kg, and 530mg/kg, respectively. Thus the copper cleanup levels for all of these sites are well above the post-remedial Surface-Area Weighted Average Concentration ("SWAC") (159 mg/kg) and dredge concentrations (121 mg/kg) proposed for NASSCO. Similarly, the mercury cleanup levels set for the Commercial Basin boatyards that required remediation were 4.8 mg/kg, which is once again almost ten times above the post-remedial SWAC (0.68) and dredge concentration (0.57) proposed for NASSCO. Cleanup levels for primary risk drivers, such as PCBs and TBT, are also significantly more stringent at NASSCO compared with Campbell. Barker Depo, Ex. 1210 at Exhibit A. [Comment No. 22, TCAO, at Comment No. 23, TCAO, at 32, 36, DTR, at 32, 36.4].

To reach these low cleanup levels, Staff has introduced excessive levels of conservatism in its analysis. [Comment No. 24, TCAO, at 14-28, 32, DTR, at 14-28, 32]. For example, Staff calculated cleanup levels for Campbell using an apparent effects approach; however, at NASSCO, Staff used the lowest apparent effects threshold, and then introduced a 40% safety buffer to further reduce the cleanup level, resulting in exceptionally low cleanup levels compared to other sites in the bay. Barker Depo, 373:14 – 374:22. [Comment No. 25, TCAO, at 14-28, 32, DTR, at 14-28, 32]. Moreover, cleanup levels at NASSCO are also more stringent than similar sites elsewhere in the nation. Barker Depo, at 944:18 – 947:11, 47:16 – 949:21. [Comment No. 26, TCAO, at 32, 36, DTR, at 32, 36.4].

**Comment ID:** 156  
**DTR Section:** 12

**Organization:** NASSCO

**Comment:**

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V. MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

A. Natural Attenuation Is Occurring And Should Be The Preferred Remedy (Findings 30, 36)

3. Site-Specific Circumstances Support Monitored Natural Attenuation As The Preferred Remedy (Finding 18, 23-24, 27-28, 30)

In addition to the fact that monitored natural attenuation is already occurring, the following site-specific circumstances support monitored natural attenuation as the preferred remedy for the Site:

a. The NASSCO Site Will Remain A Secured Shipyard Until At Least 2040 (Findings 28, 30)

The fact that NASSCO will remain a secured shipyard until at least 2040 supports implementation of monitored natural attenuation because security measures will prevent human exposure to site contaminants and wildlife during the recovery period. Exponent Report, at 18-6; Finley Report, at 6. [Comment No. 236, TCAO, at 28, 30, DTR, at 28.2, 30]. Additionally, the demands being made, and to be made, on the waters at the Site, given its use as an active shipyard, also support monitored natural attenuation. [Comment No. 237, TCAO, at 28, 30, DTR, at 28.2, 30].

Based on the operative land use plans, NASSCO property is required to be used for marine-oriented industrial uses, and is classified as prime industrial land. Finley Report, at 3; Alo Depo, at 106:21 – 107:8. Further, under the terms of NASSCO's current lease, NASSCO will remain a secured shipyard until at least 2040. Attachment C, San Diego Unified Port District Lease to NASSCO, and Amendments thereto ("Lease"). As an active industrial facility, the shipyard does not permit fishing, swimming, recreation, or other such uses at the Site. Armed military personnel, and other safeguards, including a 300 foot security boom, ensure that these restrictions are enforced. [Comment No. 238, TCAO, at 28, 30, DTR, at 28.2, 30]. Moreover, there is no indication that NASSCO will be used as a recreational area in the foreseeable future, indicating that existing security measures will continue to prevent exposure to humans during the recovery period. See Finley Report, at 3. [Comment No. 239, TCAO, at 28, 30, DTR, at 28.2, 30]. It is both common and appropriate to take these types of land use considerations into account in choosing an appropriate remedy. Alo Depo, at 107:23 – 108:6, 109:4 – 109:7. Yet,

the TCAO is based upon conservative assumptions that account for recreational, and other uses that are simply not relevant to the Site, especially considering that monitored natural attenuation is expected to remediate the sediments to the proposed levels long before NASSCO's lease expires. [Comment No. 240, TCAO, at 12, 18, 23-24, 27-28, 30, DTR, at 12, 18, 23-24, 27-28, 30].

**b.NASSCO Implements Extensive Pollution Prevention Mechanisms To Eliminate The Possibility Of Direct Releases Of Contaminants (Finding 2, 30)**

The shipyard has incorporated extensive pollution prevention controls to eliminate the possibility of direct releases of contamination, Exponent Report, at 18-6. These measures include (1) the collection and treatment of all rainwater and other liquids released within the shipyard's paved areas, with subsequent discharge to the sewer system; (2) onsite treatment of bilge and ballast water; (3) the implementation of state of the art Best Management Practices; and (4) ongoing training of all personnel in pollution prevention practices. Id. As a result, any significant future contribution of contaminants from shipyard sources is unlikely. Id. [Comment No. 241, TCAO, at 2, 30, DTR, at 2.3.1, 2.5, 30].

Taken together, the site-specific factors present at NASSCO strongly support monitored natural attenuation, and meet the criteria identified in the DTR that indicate that a site is "particularly conducive" to monitored natural attenuation. See DTR, at 30-2. [Comment No. 242, TCAO, at 2, 28, 30, DTR, at 2.3.1, 2.5, 28, 30].

**Comment ID:** 157

**Organization:** NASSCO

**DTR Section:** 34

**Comment:**

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NOTE NASSCO'S COMMENTS No. 27 THRU No. 28 ARE CONTAINED HEREIN

**III. THE TENTATIVE CLEANUP AND ABATEMENT ORDER RESULTS IN THE DISPARATE TREATMENT OF NASSCO, CONTRARY TO LAW**

III.2. The Remedial Monitoring and Post-Remedial Monitoring Programs are unprecedented compared to other sediment remediation projects throughout SD Bay, and California (Findings 34, 36)

Staff has also proposed extensive remedial and post-remedial monitoring programs that are far more stringent than those required for other similar sediment remediation projects in San Diego Bay. Gibson Depo, at 103:23 – 104:12, 133:17 – 135:7 (testifying that the remedial and post-remedial monitoring programs described in the TCAO and DTR are more extensive than any other projects in San Diego Bay). For example, the Regional Board has never before required the implementation of a five- to ten-year post-remedial monitoring plan for a site not involving an engineered cap. Id. [Comment No. 27, TCAO, at 34, 36, DTR, at 34.2, 36.4].

In sum, by requiring significantly more stringent cleanup levels and monitoring programs for NASSCO and failing to regulate NASSCO in the same manner as other similarly situated shipyards and boatyards, the TCAO violates the consistency requirement expressly stated in

Resolution 92-49, as well as principles of due process and equal protection. [Comment No. 28, TCAO, at 32, 36, DTR, at 32, 36.4].

**Comment ID:** 158

**Organization:** NASSCO

**DTR Section:** 14 to 28

**Comment:**

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**IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE**

**A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)**

The Regional Board is authorized to adopt CAOs based only on sound scientific evidence that a potentially responsible party has “discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance . . . .” Cal. Water Code §13304(a) . Here, Staff alleges that NASSCO “caused or permitted the discharge of waste to the Shipyard Sediment Site, resulting in an accumulation of waste in the marine sediment [that] has caused conditions of contamination or nuisance in San Diego Bay that adversely affect aquatic life, aquatic-dependent wildlife, human health, and San Diego Bay beneficial uses.” TCAO, at ¶ 1. However, extensive scientific investigation conducted at the Site, including the sediment quality investigation upon which the findings and conclusions of the TCAO are purportedly based, indicates that beneficial uses at the Site are not unreasonably impaired and that active remediation, beyond monitored natural attenuation, is not warranted. Exponent Report, at 19-12 – 19-13; TCAO, at ¶ 13. [Comment No. 29, TCAO, at 13-28, DTR, at 13-28]

**1. The Sediment Investigation Was Extensive and Unparalleled (Finding 13) [Comment No. 30, TCAO, at 13, DTR, at 13.1]**

As documented in the TCAO and DTR, Staff’s findings are based primarily upon the results of a “detailed” sediment investigation that was conducted at the site in 2001 and 2002 by NASSCO and BAE Systems San Diego Ship Repair Facility (“BAE Systems”), under the direction and supervision of staff. TCAO, at ¶ 13; DTR, at 13-1 – 13-4. The investigation included sampling of five reference areas selected by Regional Board staff and fifteen triad stations within NASSCO’s leasehold alone, resulting in a comprehensive data set that measured sediment chemistry, sediment toxicity, benthic macroinvertebrate communities, bioaccumulation in fishes and invertebrates, and fish health using multiple independent indicators. Evaluation of Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 for the NASSCO Shipyard Sediment Site, Expert Report of Thomas C. Ginn, Ph.D. (“Ginn Report”), at 11-12. For each sampling station, synoptic measurements were made of sediment chemistry, sediment toxicity, and the structure of benthic macroinvertebrate communities. Id. Sediment toxicity was evaluated using three different toxicity tests, and the structure of benthic

macroinvertebrate communities was assessed by analyzing five replicate samples from each station. Id. In addition, bioaccumulation was measured in invertebrates and fish that are prey to aquatic-dependent wildlife, and fish health was assessed by comparing the condition of 100 fishes caught at, and near the NASSCO leasehold, across a variety of indicators, including weight, length, age, and microscopic evaluation of organs for evidence of lesions or other abnormalities. Id. As a result, the investigation—which was conducted with substantial oversight and input from Staff, stakeholders, and the public—contains ample site-specific evidence, and has been described by Staff as “the most extensive sediment investigation ever conducted for a site in San Diego Bay,” if not California. Exponent Report, at 1-2 – 1-4 (summarizing the directives and guidance provided by Regional Board staff throughout the planning and execution of the sediment investigation and Exponent Report); Deposition of David Barker (“Barker Depo”), at 80:2 – 80:22, 82:3 – 82:4, 2:14 – 83:23 (discussing the scope, quality, and Staff involvement in the sediment investigation); DTR, at 13-2 – 13-3 (summarizing Staff and stakeholder involvement in the sediment investigation).

The results of this extensive and unparalleled investigation, as discussed in detail below, found that risks to human health and aquatic-dependent wildlife at the shipyards “are well within acceptable levels” and that the sediment toxicity and adverse effects on benthic communities observed at certain locations are attributable to pesticides, not metals, butyltins, PCBs, or PAHs. Exponent Report, at 19-1. Moreover, the report found that aquatic life, aquatic-dependent wildlife, and human health beneficial uses are at approximately 95 percent of ideal conditions, and that any benefits from active remediation, such as dredging, would provide minimal incremental benefit at a very high cost. Id. at 19-13. As a result, the report concluded that “monitored natural recovery is therefore the most technically and economically feasible approach to addressing current sediment conditions at the shipyard.” Id. Yet, despite the favorable results and recommendations from this comprehensive multimillion dollar sediment investigation, overseen by Regional Board Staff, the Cleanup Team now seeks to require large-scale dredging of sediments within, and adjacent to, NASSCO’s leasehold to achieve cleanup levels that are unprecedented in San Diego Bay. [Comment No. 31, TCAO, at 14-32, 36, DTR, at 14-32, 36]. This aggressive approach violates the legal principles embodied in Section 13304 and Resolution 92-49, is contrary to existing scientific and technical evidence, and is not supported by the record. [Comment No. 32, TCAO, at 14-32, 36, DTR, at 14-32, 36].

**Comment ID:** 159

**Organization:** NASSCO

**DTR Section:** 30, 32, 34

**Comment:**

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V. MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

B.Implementing The Order Will Cause Greater Harm To Beneficial Uses Than No Action  
(Findings 30, 32, 34)

Implementing the large-scale dredging described in the TCAO will result in greater harm to beneficial uses than leaving sediments in place and allowing contaminants to attenuate naturally. See Exponent Report, at § 18. [Comment No. 243, TCAO, at 30, 32, 34, DTR, at 30, 32, 34].

First, sediments buried below approximately 10 cm do not impact the water or marine environment because they are below the biologically active zone, and are therefore not biologically available. Gibson Depo, at 156:3 – 157:12. However, if dredging is required, these contaminants may be re-suspended in the water column, causing the concentrations of contaminants in the water phase to increase. Response to NASSCO’s RFAs, at RFA No. 42 – 43. [Comment No. 244, TCAO, at 32, 34, DTR, at 32.5, 32.7, 34].

Second, Site sediments are currently supporting a mature and thriving benthic community, with total abundance and richness comparable to reference areas. See discussion at Section III.A.2.c., supra. Sediment profile imaging also shows that the benthic community has attained a “mature equilibrium,” as classified by an independent testing organization. Id. Dredging sediments from portions of the leasehold would (1) result in the immediate destruction of many of the existing mature benthic macroinvertebrate communities located at the Site; (2) destroy existing eelgrass beds; (3) risk re-suspension of buried contaminants; and (4) risk re-colonization of Site sediments by invasive species. See Exponent Report, at 18-9; Barker Depo, at 306:22 – 307:21. Accordingly, if significant portions of the leasehold are dredged, there is no guarantee that the healthy, mature benthic communities presently occupying the Site will return. Barker Depo, at 912:6 – 915:19 (confirming that Staff is unable to predict with any level of confidence what type of benthic community may be reestablished after dredging). [Comment No. 245, TCAO, at 18, 32, 34, DTR, at 18.4, 32.5, 32.7, 34].

Further, any positive impacts resulting from dredging would depend on the extent and timeframe in which dredged sediments recover to the equivalent of reference conditions following the cleanup. Id. at 18-8. Because observed impairments are attributable to continuing off-site discharges from storm drains and Chollas Creek, the recovery of benthic communities in dredged areas could be impeded as contaminants from urban runoff continue to be deposited at the Site, resulting in minimal benefits. Id., at 18-9. [Comment No. 246, TCAO, at 4, 12, 30, 32, 33, 34, DTR, at 4, 12.1, 30.1, 30.2, 32.5, 32.7, 33.1-33.4, 34].

Thus, dredging confers minimal benefits over natural attenuation, and risks serious detriment to beneficial uses. These negative impacts can and should be avoided, without compromising beneficial uses, by selecting monitored natural attenuation as the recommended remedy. [Comment No. 247, TCAO, at 30, 32, 33, 34, DTR, at 30, 32, 33, 34].

**Comment ID:** 160

**Organization:** BAE Systems

**DTR Section:** 32.5.2, Tables 32-19, 32-20, 32-21, 32-22

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald’s Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

5. Comment C.2.5 that “There is insufficient evidence to demonstrate that the 60% LAET values provide a reliable basis for identifying

polygons that are ‘Likely’ impacted” is Invalid (DTR § 32.5.2; DTR Tables 32-19, 32-20, 32-21 and 32-22)

The DTR uses 60% LAET values for the five primary COCs as one line of evidence for evaluating potential benthic impairment at the Site. Comment C.2.5 of MacDonald 3/11/11 Expert Report states that “There is insufficient evidence to demonstrate that the 60% LAET values provide a reliable basis for identifying polygons that are “Likely” impacted.”

MacDonald states that “the 60% LAET values presented in Table 32-19 are substantially higher than the sediment quality guidelines that were used in the Triad assessment presented in the DTR and those that have been routinely used to evaluate sediment quality conditions at marine and estuarine sites throughout the United States.” He then presents a table that compares the 60% LAET values with the ERM values of Long et al. (1995). (It should be noted that McDonald is a co-author of the Long article and as such the reference point is suspect.)

The statement and comparisons made by MacDonald are flawed, because the 60% LAET values were derived as site-specific sediment quality values that reflect the mixtures of chemicals at the Site, in addition to other important factors such as the site-specific bioavailability of those chemicals. By contrast, the ERM values were derived from sediment chemistry and toxicity data collected throughout the U.S., without any consideration of bioavailability. They are therefore more suitable as initial screening values for a site, rather than values that can reliably predict the presence or absence of sediment toxicity on a site-specific basis. In fact, Long et al. (1995) recognized the limited usefulness of the ERM values when they concluded that the values “should be used as informal screening tools in environmental assessments”, and “they are not intended to preclude the use of toxicity tests or other measures of biological effects.”

Because the ERM values are generic screening values that do not consider bioavailability, it is not surprising that the 60% LAET values are greater than the ERM values, as the former values reflect the site-specific conditions that occur at the Site. Therefore, MacDonald’s statement described above has no bearing on the usefulness of the site-specific 60% LAET values for identifying polygons that are likely impaired at the site.

The development of LAET values for the Site in Exponent (2003) provided conservative site-specific effects levels with which potential sediment toxicity can be evaluated. As described in Exponent (2003), the LAET values represented the lowest of the AET values calculated for the four biological tests evaluated at the Site: 10-d amphipod survival test, 48-h bivalve normality test, 15-min echinoderm fertilization test, and alterations of in situ benthic macroinvertebrate communities. All four of these tests are considered sensitive indicators of sediment toxicity, and three of the tests (i.e., all except the echinoderm test) are identified as the preferred tests for the use as part of the California Sediment Quality Objectives (SQOs, CSWRCB 2009) although, as described in the DTR, the Site is explicitly exempt from regulation by the SQOs. Therefore, as discussed in Exponent (2003), selection of the lowest AET of the four tests as the site-specific effects level for each COC, is a conservative and protective method for evaluating potential sediment toxicity. There is strong precedent for using LAETs as conservative effects levels, as they form the basis of the Sediment Management Standards for Washington State (Ecology

1995), and have been successfully used to manage contaminated sediments in that state for over 15 years. In addition, the approach used to develop the LAETs, has been reviewed and approved for site-specific use by EPA's Science Advisory Board (EPA 1989).

Given that the LAETs can be considered conservative and protective effects levels for evaluating potential sediment toxicity at the Site, the selection of the 60% LAET values for use in the DTR and TCAO provides an even greater layer of protectiveness for the sediment quality evaluations conducted at the site. MacDonald's assertion that there is insufficient evidence to demonstrate that the 60% LAET values provide a reliable basis for evaluating sediment toxicity at the Site is, therefore, invalid.

With respect to the supplemental Triad analysis conducted in 2009 at five stations outside the remedial footprint at the Site (and described in Section 35.5.2 of the DTR), MacDonald states that the conclusions resulting from that analysis are invalid because too few stations were evaluated, and the maximum COC concentrations were substantially below both the 60% LAET values and the SS-MEQ threshold value of 0.9. As described in Section 35.5.2 of the DTR, the five stations evaluated for the supplemental Triad analysis were selected because they had not been sampled for sediment toxicity or benthic community alterations in 2001/2002, were outside the remedial footprint, and had among the highest primary COC concentrations of all stations outside the footprint. The supplemental Triad analysis, therefore, provided valuable new information on whether adverse biological effects would potentially be found in unremediated areas after remediation was completed.

MacDonald states that more than five stations are needed to conduct a reliability analysis. However, he fails to recognize that the five supplemental Triad stations are supplemental to the 30 original Triad stations, and that there are a total of 35 stations with which the reliability of the 60% LAET and SS-MEQ evaluations can be determined. That is, the five supplemental stations provide additional information to that provided by the 30 original stations. MacDonald states that for the Tri-State Mining District and Calcasieu Estuary sites (MESL 2002, MacDonald et al. 2009) he used 70-100 stations to evaluate the reliability of toxicity thresholds. This statement is misleading because inspection of those reports shows that he actually used those stations and the reliability calculations to develop the site-specific toxicity thresholds, rather than to independently evaluate them. This is analogous to the manner in which the original 30 Triad stations were used to develop the site-specific thresholds for the Site. MacDonald did not conduct reliability evaluations of the site-specific thresholds using independent data that were not included in the development of the thresholds, as was done with the supplemental Triad stations for the Site. In addition, the Tri-State Mining District study addressed water bodies within a geographic area of over 3,500 square miles (i.e., 2,176,000 acres), and the Calcasieu Estuary study addressed water bodies within a geographic area of over 19 square miles (i.e., 12,400 acres). Given that those sites are vastly larger than the Site (i.e., approximately 144 acres), it is not surprising that larger numbers of sediment samples were collected to develop and validate the site-specific effects thresholds.

Because none of the stations located outside the remedial footprint at the Site had exceedances of the 60% LAETs for one or more of the primary COCs (see Table A33-2 of the DTR), it was not possible to sample sediments with such elevated COC concentrations, given the



station selection criteria described above. In addition, the only station outside the remedial footprint where the threshold SS-MEQ value of 0.9 was exceeded was NA07 (i.e., 0.91), which was found to be not likely impaired based upon the original Triad evaluations for both sediment toxicity and benthic community effects. Therefore, it also was not possible to sample sediments outside the remedial footprint with SS-MEQ values greater than 0.9 for the supplemental Triad analysis.

Given the information presented above, the five stations selected for the supplemental Triad analysis had some of the highest concentrations of one or more of the primary COCs found outside the remedial footprint (see Table A33-2 of the DTR). The COCs for which concentrations were considered elevated for the five stations are as follows:

SW06: HPAH, PCBs, TBT

SW19: Hg

SW30: Cu, Hg, HPAH, PCBs, TBT

NA23: Cu, Hg, HPAH, PCBs, TBT

NA24: Cu, Hg, PCBs.

As stated in Section 32.5.2 of the DTR with respect to the results of the supplemental Triad analysis, "at all five stations, the SS-MEQ/60% LAET thresholds successfully predicted the absence of "Likely" benthic community impacts." This statement confirms that these thresholds are environmentally protective, and is consistent with the conclusions described above in the response to Comment C.2.4, that the SS-MEQ threshold of 0.9 is biased to be environmentally protective. Its ability to accurately predict the absence of impairment (referred to as non-likely efficiency in Table A32-11) was 94 percent (i.e., 16 of 17 predictions). If the results for the five supplemental Triad stations are added to those of the original Triad stations, the accuracy of the SS-MEQ in predicting the absence of impairment would increase to 95.5 percent (i.e., 21 of 22 predictions).

MacDonald states that "the samples that were collected to support the reliability assessment had SS-MEQ values that were substantially below the threshold that was used to identify "Likely" impacted samples: they ranged from 0.38 to 0.69 compared to the threshold of 0.9. Therefore, lower values than the selected SS-MEQ would also have provided a reliable basis for classifying these sediment samples as not "Likely" impacted." Considering that the SS-MEQ values ranged from 0.34 to 4.22 for the 30 original Triad stations (see Table A32-11 of the DTR), it is misleading to state that the difference between 0.9 and 0.69 is "substantial." In addition, three of the original Triad stations with non-likely effects had an SS-MEQ value of 0.69 and an additional four original Triad stations with non-likely effects had SS-MEQ values of 0.66 to 0.68. Those results provide considerable support that the threshold SS-MEQ should be greater than 0.69, and it is highly unlikely that the results of the sediment quality evaluations would differ if the threshold SS-MEQ was adjusted to be another value within the narrow window between 0.69 and 0.9.

Based on all of the information presented above, MacDonald's assertion that the 60% LAET/SS-MEQ values are not reliable for evaluating sediment toxicity at the Site is invalid.

**Comment ID:** 161

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

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V. MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

C.Implementing The Tentative Cleanup And Abatement Order Would Have Significant Negative Economic and Social Impacts On NASSCO And The Community (Findings 30, 31, 32, 37)

Under Resolution 92-49, the Regional Board must take into account the total values involved, including economic and social values. The DTR concludes that dredging to alternative cleanup levels is technologically and economically feasible. TCAO, at ¶¶ 30, 31, DTR, at 30-7, 31-3. However, extensive dredging at NASSCO would result in significant negative impacts to NASSCO and the surrounding community; thus, taking these values into account, dredging is costly and unjustified, especially since there are little or no corresponding benefits to human health or the environment. [Comment No. 248, TCAO, at 30, 31, 32, 37, DTR, at 30, 31, 32, 37].

In particular, dredging in certain areas at NASSCO may jeopardize the integrity of slopes and structures at the leasehold, and is technologically infeasible in certain areas. Barker Depo, at 154:25 – 155:22, 156:23 – 157:16. For example, there are significant structural stability problems associated with dredging around piers, pilings, and steep slopes, such as those surrounding the floating drydock sump, which render dredging in such areas technologically infeasible. Id. Further, vital ship repair and construction activities will be significantly disrupted by dredging, and could result in delays or contractual breaches with the U.S. Navy and other customers. See, e.g., Exponent Report, at §§ 18.2, 18.4. [Comment No. 249, TCAO, at 30, 32, 33, DTR, at 30, 32.7, 33.1].

Large-scale dredging will also impact the surrounding community, and potentially present environmental justice issues, due to impacts including, but not limited to increased truck traffic, diesel emissions from trucks and heavy equipment, noise, accident risks, transportation of large volumes of waste through the neighborhood, increased traffic on local streets, and the need to establish large staging areas for dewatering activities. Id. [Comment No. 250, TCAO, at 32, 33, 37, DTR, at 32.7, 33.3, 37].

**Comment ID:** 163

**Organization:** BAE Systems

**DTR Section:** 18.3, Table 18-7

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald's Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

6. Comment C.2.6 that “The procedures that were used to designate sediment samples from the Shipyard Sediment Site as ‘Likely’ impacted are not protective” is Misleading and Unsupported (DTR § 18.3; DTR Table 18-7)

The methods used in the DTR to evaluate sediment at the Site were selected in large part to be consistent with those recommended by EPA, as well as those commonly used to evaluate contaminated sediment sites in the U.S. by sediment quality practitioners. Comment C.2.6 of MacDonald 3/11/11 Expert Report states that “The procedures that were used to designate sediment samples from the Shipyard Sediment Site as “Likely” impacted are not protective.”

MacDonald states that “the approach to defining the normal range of amphipod responses is not consistent with the practices that are currently recommended by the Science Advisory Group on Sediment Quality Assessment”, and cites Sustainable Fisheries Foundation (2007) as the basis for that assertion. This statement is highly misleading because it provides the impression that there exists a formal science advisory group (potentially with governmental agency endorsement), and that the citation is a substantive document. In his October 2010 deposition, MacDonald stated that this advisory group was “an informal group of individuals who have a common interest in sediment quality assessments, that share information, meet from time to time to discuss technical issues.” (MacDonald Deposition, at pp. 82-85.) He also stated that “all of the participants fund their own participation”, “there is no headquarters”, and “there is no website.” (Id.) MacDonald further acknowledged that there is no formal group structure, no president, and no official list of members other than an email list. The citation provided by MacDonald is the unpublished proceedings of a workshop convened in British Columbia by the Sustainable Fisheries Foundation, a non-profit environmental organization of which MacDonald is one of the two Executive Directors. The purpose of the workshop was to advise the British Columbia Ministry of the Environment on sediment quality issues.

The “Science Advisory Group” referred to by MacDonald is simply an informal group of people with a common interest in sediment quality that has no formal charter, no endorsement or support by a governmental resource agency, no independent funding, no regulatory authority, and no formal advisory role. In addition, the citation referred to by MacDonald above is an unpublished summary of a workshop designed to advise a Canadian governmental agency, and sponsored by a non-profit environmental organization of which MacDonald is an Executive Director. It is clear that there is little independent and substantive support for MacDonald’s assertion that the methods used for the Site are inconsistent with the common practice.

In contrast to MacDonald’s assertion and citation discussed above, EPA has provided clear guidance on the selection of reference areas for environmental assessments (e.g., U.S. EPA 1994, 1997, 1999, 2000, 2005, 2006). A number of these EPA guidance documents are summarized in Section 17.2 of the DTR. Briefly, the EPA guidance recommends that reference areas reflect the habitat conditions and background levels of chemical contamination that would exist at a study site in the absence of site-related sediment contamination. The background conditions can incorporate levels of chemical contamination or biological responses that are considered representative of the general conditions in a water body removed from major contaminant sources. Therefore, consistent with EPA guidance (and stated Section 17.2 of the DTR), the selection of the reference areas for the Site was “consistent with the San Diego Water

Board’s goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination.” MacDonald’s assertion that the selection of reference areas for the Site was inconsistent with current guidance is therefore incorrect, because the selection process was consistent with EPA guidance.

MacDonald states that the inclusion of reference stations with values of amphipod survival less than 80 percent is inappropriate. However, if such a selection criterion was used at the Site, it could potentially ignore the full range of amphipod responses that may occur in valid reference areas of San Diego Bay, and bias the reference envelope to fit a pre-conceived notion of what the minimum level of survival in a reference area should be. In contrast, the Washington State Sediment Management Standards (Ecology 1995), recognize that survival in the 10-d amphipod test based on *Rhepoxynius abronius* from reference areas can be as low as 75 percent, based on a survey conducted in multiple reference areas of Puget Sound, Washington. In addition, Phillips et al. (2001) identified control-adjusted survival thresholds as low as 75 and 77 percent for amphipod tests based on *Eohaustorius estuarius* and *Rhepoxynius abronius*, respectively.

In addition to MacDonald’s unwarranted definition of the acceptable levels of amphipod survival in reference areas, his focus only on the sediment toxicity results for the reference stations is inappropriate because it ignores the additional information on sediment chemistry and benthic macroinvertebrate communities that was used to identify the reference stations for the Site. As documented in Table 17-2 of the DTR, each reference station was carefully evaluated using multiple lines of evidence before it was selected for use. MacDonald’s focus on a single line of evidence (i.e., sediment toxicity) is therefore inconsistent with a weight-of-evidence evaluation and therefore inappropriate.

**Comment ID:** 165

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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#### V. MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

D.The Difference In Risk Reduction Between The Proposed Footprint And Monitored Natural Attenuation Is Insignificant And Does Not Meet The State Board’s Test For Economic Feasibility (Finding 30-32, 36)

Resolution 92-49 requires that Regional Board “shall concur with any . . . cleanup and abatement proposal which the discharger demonstrates and the Regional Board finds to have a substantial likelihood to achieve compliance, within a reasonable time frame, with cleanup goals and objectives” that implement permanent solutions that do not require ongoing maintenance, wherever feasible. Resolution 92-49, at III.A. Further, the selected alternative must be economically feasible. Id. Economic feasibility refers to the objective balancing of the incremental benefit of attaining more stringent cleanup levels compared with the incremental cost of achieving those levels.; it does not refer to the discharger’s ability to pay the costs of the

cleanup. DTR, at 31-1. According to the DTR, the benefits of remediation are best expressed as the reduction in exposure of human, aquatic wildlife, and benthic receptors to site-related contaminants of concern. Id.

Applying this standard, it is clear that the difference in risk-reduction between dredging and monitored natural attenuation is insufficient to justify the ample additional costs associated with dredging. Dredging the NASSCO site alone in accordance with the TCAO is expected to cost many millions of dollars; however, there are minimal, if any, benefits associated with dredging that will not also be achieved through monitored natural attenuation. [Comment No. 251, TCAO, at 30, 31, 32, 36, DTR, at 30, 31, 32.7, 36.4].

First, as shown extensively throughout this letter and in the record, current conditions are protective of aquatic wildlife, aquatic-dependent wildlife, or human health when examined using realistic, risk-based assumptions under a neutral and scientifically appropriate decision framework. See Section III. [Comment No. 252, TCAO, at 14-28, DTR, at 14-28]. Second, observed risks generally are not correlated to shipyard chemicals. See Section III.B.1. Sediment toxicity is not statistically associated with any shipyard-associated chemicals, and causation analysis demonstrates that LAET exceedances are not the cause of observed reductions in aquatic life beneficial uses; rather, such effects are attributable to off-site sources and should abate once those sources are controlled. Id. Likewise, alterations of benthic macroinvertebrate communities are generally not related to shipyard chemicals. Id. Given these already favorable site conditions, any incremental benefits associated with dredging will be minimal, and not justified by the incremental costs, particularly where there is evidence that such dredging will cause greater environmental harm than leaving the sediment in place. [Comment No. 253, TCAO, at 30, 31, 32, 34, DTR, at 30, 31, 32, 34].

Additionally, the June 2009 sediment testing suggests that monitored natural attenuation is already occurring at rates that will attain the proposed post-remedial SWACs within a reasonable time; in fact, such levels have already been achieved through monitored natural attenuation at certain stations for the five primary contaminants of concern. See Section V.A.1. [Comment No. 254, TCAO, at 30, 32, DTR, at 30.1.1, 32.2 – 32.6]. The DTR also estimates that new sediments are deposited at a rate of 2 cm/yr, suggesting that clean sediments will quickly bury any residual contamination. Response to NASSCO's RFAs, at RFA No. 56. [Comment No. 255, TCAO, at 30, DTR, at 30.1]. Accordingly, the incremental benefits of dredging, if any, are minimal, and do not justify the substantial additional financial, social, and environmental costs associated with dredging. [Comment No. 256, TCAO, at 30, 31, 32, 36, DTR, at 30, 31, 32.7, 36.4].

**Comment ID:** 167

**Organization:** BAE Systems

**DTR Section:** 33.1.1

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald's Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

7. Comment C.2.7 that "The rationale for excluding polygon NA22 from the Proposed Remedial Footprint is inappropriate" is Invalid and Unsupported (DTR § 33.1.1)

The DTR stated the Polygon NA22 will be evaluated as part of a separate TMDL process and therefore was not considered part of the Shipyards Site for the TCAO. Comment C.2.7 of MacDonald 3/11/11 Expert Report states that "The rationale for excluding polygon NA22 from the Proposed Remedial Footprint is inappropriate."

MacDonald states that "NA22 should be remediated because COCs in sediments are likely adversely affecting benthic invertebrates within this polygon", and that "the suggestion that the TMDL process will provide a more effective basis for making a decision on NA22 is invalid." However, these statements are invalid. As stated in Section 33 of the TCAO, "portions of polygons NA20, NA21, and NA22 as shown in Attachment 2 were omitted from this analysis because it falls within an area that is being evaluated as part of the TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas Creek TMDL and is not considered part of the Shipyard Sediment Site for purposes of the CAO." The decision to remove these polygons from the Site was therefore an administrative one, rather than a technical one, and therefore does not require technical justification as MacDonald implies. In addition, because MacDonald is not participating in the design of the TMDL process for these polygons he has no direct knowledge of what the process will include. Therefore, MacDonald's assertion regarding the manner in which NA22 will be addressed is unsupported.

**Comment ID:** 168

**Organization:** NASSCO

**DTR Section:** 18, 32

**Comment:**

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VI.ADDITIONAL ISSUES

NASSCO offers the following points as additional clarification of the findings reached in the TCAO and the DTR.

A.The TCAO and DTR Should Be Corrected To Identify The Correct Number of Likely Stations (Findings 18, 32)

Table 18-1 in Volume II of the DTR, and the sections that follow, correctly summarize the outcome of the DTR Triad analysis. According to this analysis, there are six "likely" stations, two of which are at NASSCO (NA19 and NA22), and four of which are at BAE (SW04, SW13, SW22, and SW23). NA22 is footnoted in Table 18-1 as being excluded from the TCAO.

In Volume III of the DTR, however, there is a discussion of the Site-Specific Median Effects Quotient (SS-MEQ) derivation in Section 32.5.2, where these six "likely" stations are incorrectly described as three "likely" and three "possible" stations.

The SS-MEQ was derived by calculating the median concentration of individual COCs at 6 of the 30 Triad stations (Table 32-20). Three of the six included stations identified as likely impaired under the weight of evidence analysis described in Section 18 of this Technical Report (NA22, SW04, and SW13). Three possibly-impaired stations with the highest potential for chemically-associated effects (among possibly-impaired stations) were also included in SS-MEQ derivation (NA19, SW22, and SW23). These stations exhibited both “Moderate” toxicity and chemical concentrations just below levels indicative of the “High” LOE category by the Triad sediment chemistry ranking criteria (Table 18-1). The SS-MEQ threshold was then established by conservatively optimizing the performance of the quotient in predicting likely effects or the three most chemically-impaired possible stations (true positives) while minimizing false negatives.

DTR, at pp. 32-31 – 32-32 [Comment No. 257, TCAO at 32, DTR, at 32].

To correct any potential for misunderstanding, pages 32-31 and 32-32 of the DTR should be amended to reflect the following changes:

The SS-MEQ was derived by calculating the median concentration of individual COCs at 6 of the 30 Triad stations (Table 32-20). Three of the All six included stations were identified as likely impaired under the weight of evidence analysis described in Section 18 of this Technical Report (NA19, NA22, SW04, SW13, SW22, and SW123). Three possibly-impaired stations with the highest potential for chemically-associated effects (among possibly-impaired stations) were also included in SS-MEQ derivation (NA19, SW22, and SW23). These stations exhibited both “Moderate” toxicity and chemical concentrations just below levels indicative of the “High” LOE category by the Triad sediment chemistry ranking criteria (Table 18-1). The SS-MEQ threshold was then established by conservatively optimizing the performance of the quotient in predicting likely effects onr the threesix most chemically-impaired possible stations (true positives) while minimizing false negatives.

The TCAO correctly describes the Triad results. Finding 18 correctly summarizes that the Triad analysis resulted in six “likely” stations. Although the SS-MEQ derivation text is not directly reproduced, there is a footnote on page 17 that references this text, so the discrepancy is indirectly reproduced in the TCAO. So long as the edits to pages 32-31 and 32-32 are implemented, the TCAO’s reference to Section 32.5.2 will not introduce any confusion.

**Comment ID:** 169

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

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VI.ADDITIONAL ISSUES

B.The Use of Lowest Apparent Effects Threshold (LAETs) and Site-Specific Median Effects Quotient (SS-MEQ) Benchmarks Ensured That The Remediation Footprint Was Overly Protective (Finding 32)

The site-wide Triad study measured synoptic chemistry, toxicity, and surveyed the benthic community at 30 of the 66 Shipyard sediment investigation stations. Potential impacts of sediment chemicals to the benthic community at the 36 Non-Triad stations, for which no

biological data were collected, was inferred through the use of site-specific chemistry benchmarks, developed from the Triad data. Two independent benchmarks were developed: The Site-Specific Median Effects Quotient (SS-MEQ) and Lowest Adverse Effects Threshold (LAET).

The SS-MEQ is a multiple chemical benchmark calculated from the median sediment concentration of the five primary COCs at the six stations that were scored as “likely impacted” in the DTR Triad analysis (NA19, NA22, SW04, SW13, SW22, and SW23). For each station, effects quotients (the ratio of measured concentration to median “likely impacted” concentration) were calculated for each of the primary COCs, and these were averaged to yield the multi-chemical SS-MEQ. See DTR at 32.5.2. Furthermore, for each primary COC, apparent effects thresholds (AETs) were developed for each of the seven biological endpoints evaluated in the DTR Triad analysis (three toxicity tests and four benthic community parameters or indices). The AET is simply the concentration above which adverse effects always occur. Accordingly, the lowest adverse effects threshold (LAET) is the lowest concentration of any of the seven AETs calculated for a given chemical.

Both the SS-MEQ and LAET values were used as benchmarks to identify the possibility of adverse effects on benthos at the non-Triad stations. Both benchmarks were tested and determined to be conservative measures for benthic community conditions at non-Triad stations. To test the protectiveness of the SS-MEQ and LAET values, SS-MEQ and LAET values were calculated for the 30 Triad stations (for which actual benthic condition assessment had been performed) to determine how well the SS-MEQ and LAET values predicted “likely” impacts to benthic communities. When compared to the 30 Triad stations, the 60% LAET results were completely protective with respect to predicting “likely” benthic impairment, since an AET is, by definition, a no-effect level, while inaccurately identifying one “false positive” (at NA07, as discussed above), where the LAET analysis suggested possible benthic impairment but the Triad analysis demonstrated no such impairment. Notably, the DTR used a benchmark equal to 60% of the LAET, which is highly protective because it builds in a buffer below the established no-effect level.

The SS-MEQ benchmark (which was set equal to 90% of the SS-MEQ) had only one false negative out of 30 Triad stations, with respect to predicting “likely” impairment of the benthic community (at Station NA22, which is being addressed outside the current remedial design), and eight false positives, which indicates that using 90% of the SS-MEQ is overly protective by including stations that were not in fact likely impaired stations.

Accordingly, the proposed cleanup was judged to be protective of benthos because it includes all non-Triad stations that exceed either of the 60% LAET or 90% SS-MEQ benchmarks, and both metrics incorporate a significant safety factor.

It is worth noting that the highest LAET and SS-MEQ multiples found outside the cleanup footprint at NASSCO occur at Station NA07 (HPAH = 63% LAET; SS-MEQ = 0.91). Station NA07 is a Triad station for which no impacts to the benthic community were identified, however, and a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks. In fact, NA07 is one of the “false positives” identified above, because the benthic community assessment demonstrates “unlikely” benthic impacts. Therefore,



no risk-based justification for remediating NA07 exists, and NA07 was properly excluded from the proposed remedial footprint in the DTR. See Attachment B, Exponent Memorandum (May 25, 2011) at 10.

On behalf of San Diego Coastkeeper, Donald D. MacDonald submitted a report entitled, “Review and Evaluation of Tentative Clean-up and Abatement Order (No. R9-2011-001) for the Shipyard Sediment Site, San Diego Bay, San Diego, California” (March 11, 2011) (March MacDonald Report). At page 11, Mr. MacDonald notes that Table 33-6 is incorrect in that it states that for NA07, “All COCs [fall] below 60% LAET values.” DTR, at Table 33-6. As described above, Mr. MacDonald is correct, and Table 33-6 should be edited to state, “Only one All COCs slightly above below 60% LAET values (HPAH = 63% LAET).” Triad data demonstrates that there are no impacts to aquatic life at this station. [Comment No. 258, TCAO at 33, DTR, at 33.1].

**Comment ID:** 170

**Organization:** NASSCO

**DTR Section:** 33

**Comment:**

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VI. ADDITIONAL ISSUES

#### C. The March MacDonald Report Improperly Interprets Composite SWAC Ranking Values As A Remediation Trigger

In the March MacDonald Report, Mr. MacDonald alleges that the DTR does not adequately explain why ten Shipyard Site stations with Composite SWAC Ranking Values greater than 5.5 were excluded from the proposed remedial footprint. (footnote) March MacDonald Report, at 11. Although he does not identify the ten stations, it appears that Mr. MacDonald is referring to Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11. See DTR Appendix for Section 33, at Table 33-1 (excluding the five stations identified in DTR, Table 33-6). Accordingly, Mr. MacDonald asserts that the DTR’s rationale “for excluding stations with Composite SWAC Ranking Values greater than 5.5 is arbitrary and does not justify the exclusions.” Id.

Mr. MacDonald’s allegation is premised on his assumption that a Composite SWAC Ranking Value of 5.5 or greater alone is a remediation trigger sufficient to include a station in the remedial footprint. This is a foundational misunderstanding of the analysis performed in the DTR. In fact, the station-by-station Composite SWAC Ranking analysis (Section 33.1.2), station-by-station SS-MEQ analysis (Section 33.1.3), and the highest concentrations of individual COCs analysis (Section 33.1.4) were all considered simultaneously, along with Triad data and feasibility issues, to determine the remedial footprint. A brief review of the station-by-station SWAC Composite Ranking analysis found at DTR Section 33.1.2 (and supported by Table 33-1 in Appendix 33), demonstrates that it cannot alone be considered a remediation trigger. For example, if a SWAC Composite Ranking of 5.5 or greater alone had been considered a remediation trigger, then Station NA09 (currently part of the remedial footprint) would have been excluded because its SWAC Composite Ranking is only 5.4. DTR, Appendix for Section 33, at Table 33-1. [Comment No. 259, TCAO at 33, DTR, at 33.1, Appendix 33].

By the same token, there would be no discussion of Station NA22 with its low SWAC Composite Ranking of only 3.6. Id.

Furthermore, based on the weight of the evidence approach employed by the DTR, the ten stations with Composite SWAC Rankings of greater than 5.5 (including Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11) identified were properly excluded from the remedial footprint. In fact:

- None of the ten stations have a SS-MEQ value greater than the 0.90 benchmark. See DTR, Appendix for Section 32, at Table A32-12. In fact, none of the stations have SS-MEQ values of greater than 0.71. Id.
- None of the ten stations have high individual concentrations of COCs. See DTR, Tables 33-3, 33-4, and 33-5 (demonstrating that none of the ten stations rank among those stations with the highest concentrations of COCs).
- None of the ten stations exceed the 60% LAET benchmark. See DTR, Table 32-23 (no LAET exceedence for SW29 or SW30); Appendix to Section 32, Table A32-9.
- None of the ten stations have a “Likely” impaired Triad ranking.

Accordingly, it is of no moment that the DTR does not offer an explanation why the ten stations with SWAC Composite Rankings greater than 5.5 (including Stations SW29, SW25, SW15, NA01, SW18, NA16, NA03, SW30, NA04, and SW11) are not included in the remedial footprint simply because the SWAC Composite Ranking is not a remedial trigger, and numerous other analyses in the DTR demonstrate why those stations were not included in the remedial footprint. [Comment No. 260, TCAO at 33, DTR, at 33.1, Appendix 33].

(footnote) . Mr. MacDonald appears to have picked 5.5 as his cut-off value for Composite SWAC Ranking, because Station NA09’s 5.5 Composite SWAC Value is the lowest Composite SWAC Value of all the stations included in the remedial footprint.

**Comment ID:** 171  
**DTR Section:** 32

**Organization:** NASSCO

**Comment:**

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VI.ADDITIONAL ISSUES

D.Stations NA07, NA08, NA23, and NA27 Were Properly Excluded From the Remediation Footprint Because Dredging There Is Technologically Infeasible

The March MacDonald Report asserts that the DTR’s exclusion of Stations NA07 and NA23 from the remedial footprint based on technical infeasibility was erroneous. March MacDonald Report, at 17. According to the March MacDonald Report:

In order to be scientifically valid, these conclusions of technical infeasibility must be supported by detailed engineering studies of the existing slope and the impacts that various dredging techniques would have on the slope. The DTR provides no information about the existing sediment slope and includes no engineering studies to support its conclusion that dredging these

polygons is technically infeasible. For this reason, the technical infeasibility conclusion for these polygons is not scientifically defensible.

Id.

Contrary to the March MacDonald Report's assertion, the DTR does provide information about the technical infeasibility posed by dredging in Stations NA07, NA08, NA23, and NA27 (see DTR, Section 33.1.4). Furthermore, as discussed in the attached memorandum from Anchor QEA, no engineering studies are necessary to conclude that dredging in these stations is technologically infeasible. In fact, it is possible to determine that dredging is technically infeasible due to site characteristics alone. Attachment D, Memorandum by Michael Whelan, Anchor QEA (May 25, 2011) (Anchor QEA Memo), at 2-4. [Comment No. 261, TCAO at 33, DTR at 33].

**Comment ID:** 172

**Organization:** BAE Systems

**DTR Section:** 33.1.4, Table 33-6

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald's Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

8. Comment C.2.8 that "The rationale provided in Table 33-6 of the DTR for excluding certain polygons from the Remedial Footprint is not sufficient" is Misleading and Invalid (DTR Table 33-6; DTR §33.1.4)

The DTR provides substantial information on why various polygons at the Site were or were not included in the remedial footprint. Comment C.2.8 of MacDonald 3/11/11 Expert Report states that "The rationale provided in Table 33-6 of the DTR for excluding certain polygons from the Remedial Footprint is not sufficient."

MacDonald states that "the polygon SW03 was excluded from the Proposed Remedial Footprint, even though sediments within this polygon had elevated levels of cadmium." This statement is misleading because it implies that decisions about whether a polygon should be included in the remedial footprint are based solely on a single line of evidence. However, in considering the multiple lines of evidence collected at SW03, including direct measures of biological effects, this polygon was found to have a low potential for both sediment toxicity and benthic community effects and was therefore determined not to be likely impaired (see Table 18-1 of the DTR). Therefore, although cadmium concentrations may have been elevated in Polygon SW03, they did not result in moderate or high levels of biological effects, potentially due to reduced bioavailability. Because the weight-of-evidence scheme used at the Site identified SW03 as not likely impaired, that polygon was appropriately excluded from the remedial footprint. MacDonald's assertion is therefore invalid.

MacDonald also states that “technical infeasibility was identified as the rationale for excluding NA07, NA08, NA23, and NA27 from the Remedial Footprint”, and that this was “not supported by evidence in the record, such as engineering assessments, that would render these conclusions scientifically valid.” MacDonald’s assertion regarding the determinations of technical infeasibility are invalid, because those determinations were made by a group comprised of multiple parties with a range of backgrounds and expertise, including resource agencies and shipyard operations personnel. Furthermore, there is no formal requirement that engineering studies be conducted to make a determination of technical infeasibility. In addition, NA07 and NA23 were found not to be likely impaired based on the original or supplemental Triad analyses (see Tables 18-1 and 32-22 of the DTR, respectively). In addition, all primary COCs were below their 60% LAET values and SS-MEQs were less than the threshold value of 0.9 at NA08 and NA27. Therefore none of these four polygons warrant inclusion in the remedial footprint, regardless of concerns related to technical feasibility. MacDonald’s statement regarding technical infeasibility is therefore inappropriate, and ultimately irrelevant based on the chemical and biological indicators measured in the four polygons.

MacDonald also states that “no rationale was provided for excluding NA01, NA04, NA06, NA16, NA16 [sic], NA21, SW25, or SW29 from the Remedial Footprint.” This statement was apparently derived largely from MacDonald’s erroneous assumption that polygons should be included in the remedial footprint based solely on Composite SWAC Ranking Values higher than 5.5. As discussed in the response to Comment C.2.3 above, the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. In addition, the SWAC Value of 5.5 was not intended to be a threshold value. MacDonald’s assertion is therefore an artifact of his misunderstanding of how the Composite SWAC Ranking Values were used along with other lines of evidence, and is therefore invalid.

There are two discrepancies in MacDonald’s list. He erroneously identified Polygon NA06 as being excluded from the remedial footprint when, in fact, it is included in the footprint (see Attachment 4 of the TCAO). In addition, MacDonald erroneously listed Polygon NA16 twice. The reasons why the remaining six polygons in the above list were not included in the remedial footprint are found in various sections of the DTR and are summarized below:

- NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.
- NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.
- NA16: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.
- NA21: No primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.50) was less than the threshold value of 0.9.
- SW25: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.67) was less than the threshold value of 0.9.

SW29: No primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.71) was less than the threshold value of 0.9.

MacDonald's assertion that the rationale for excluding the above six polygons was not provided in the DTR is therefore invalid.

**Comment ID:** 173

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

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VII.CONCLUSION

For the reasons discussed herein, NASSCO proposes that the Site be addressed using monitored natural attenuation, as recommended in the Exponent Report.

**Comment ID:** 174

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

A. Responses to MacDonald's Evaluation of the Methodology Used (TCAO Finding 33; DTR § 33)

9. Comment C.2.9 that "The DTR failed to explicitly consider the potential effects on fish with small home ranges associated with exposure to contaminated sediments during the development of the Proposed Remedial Footprint" is Inaccurate (DTR § 33)

The DTR provided a detailed evaluation of potential effects of sediment contamination of fish at the Site. Comment C.2.9 of MacDonald 3/11/11 Expert Report states that "The DTR failed to explicitly consider the potential effects on fish with small home ranges associated with exposure to contaminated sediments during the development of the Proposed Remedial Footprint."

MacDonald states that "this represents a major limitation of the Proposed Remedial Footprint because fish with small home ranges are known to utilize benthic habitats at the site."

MacDonald also states that "the polygons with concentrations of PCBs in sediments sufficient to adversely affect fish reproduction include NA01, NA04, NA07, NA16, SW06, SW18, and SW29 (see Table 1 of this document for more information on the hazard quotients that were calculated for these polygons)."

MacDonald's assertions are both inaccurate. As part of the 2001/2002 sampling at the Site, an extensive effort was made to capture gobies at the site in addition to other fish species. As stated on Page 2-7 of Exponent (2003), "attempts were also made to collect gobies, without success at

either site." Representatives from the California Department of Fish and Game observed the fish collection effort, and agreed that gobies were absent or rare at the Site. During his deposition, MacDonald was asked if he was aware that gobies were searched for at the Site without success and he responded that "I am not aware of that." (MacDonald Deposition at 414.) During his deposition, MacDonald also conceded that he had not cited Exponent (2003) in his remediation footprint report (MacDonald 2009), and that he had conducted only a limited review of that document. (Id.) MacDonald also did not cite Exponent (2003) in his more recent MacDonald 3/11/11 Expert Report, and provided no indication in that report that he had reviewed Exponent (2003). Therefore, MacDonald failed to adequately review the foundational technical document for the Site (i.e., Exponent 2003), and has provided no other evidence to support his assertion that gobies are known to utilize the Site.

In MacDonald's statements described above, he identified seven polygons that he asserts should be included in the remediation footprint at the Site based on hazard quotients calculated for PCBs, as summarized in Table 1 of his expert report. However, inspection of his Table 1 shows that the hazard quotients for the first five of the seven polygons did not match the results presented in MacDonald (2009). Closer inspection of MacDonald (2009) showed that the results in Table 1 were due to the absence of the numeral 1 in front of the hazard quotients presented for the first five polygons.

Despite the fact that the corrected hazard quotients in Table 1 range from 1.0 to 2.59, there is no appropriate technical basis for including those polygons in the remediation footprint, because the analyses conducted by MacDonald (2009) to develop those hazard quotients are flawed. Many of the problems with the hazard quotient determinations conducted by MacDonald (2009) were identified in his October 2010 deposition, and are discussed below.

A fundamental flaw in the fish analyses conducted by MacDonald (2009) was the assumption that gobies represent an appropriate indicator species for evaluating risks to benthic fish at the Site. As discussed above, gobies were not found at the Site after an extensive sampling effort conducted as part of the 2001/2002 sampling events. Therefore, the use of gobies as an appropriate indicator species for the site by MacDonald was inappropriate. Also discussed above was the fact that MacDonald provided no documentation that gobies occur at the Site, and that he admitted that he had not reviewed Exponent (2003) in sufficient detail to know the results of the fish survey conducted at the Site.

The species selected for detailed evaluation at the Site was the spotted sand bass (*Paralabrax maculatofasciatus*) because, as stated in Exponent (2003), this species preys primarily on benthic macroinvertebrates, exhibits limited spatial movements, and is abundant in numerous kinds of habitats within San Diego Bay, including the Site (i.e., as documented during the fish sampling effort prior to the 2001/2001 sampling events). These characteristics of the spotted sand bass make it an appropriate species for assessing contaminant exposure at the Site. This determination is reinforced by the results of tissue chemistry analyses. Spotted sand bass were collected at four locations, inside and outside the leaseholds of both shipyards, and the results showed that chemical concentrations in fish tissue from inside the leaseholds were greater than concentrations in fish collected immediately outside the leaseholds (Exponent 2003). The data therefore clearly indicate that spotted sand bass are sensitive to spatial differences in

sediment chemistry concentrations at the Site. Despite the evidence that spotted sand bass should be, and are, responsive to sediment chemistry at the Site, MacDonald ignored this information and inappropriately asserts that gobies should be used as the indicator species for fish at the Site.

During MacDonald's October 2010 deposition, numerous methodological flaws in his analysis of PCBs in gobies were identified, all of which add considerable uncertainty to the results of the analysis, and call into question many of his conclusions. Each of those methodological flaws is briefly summarized below:

- Indicators Species: As discussed above, the selection of gobies as the indicator species for fish at the Site was inappropriate because they are not found at the site, and because the spotted sand bass was shown to be an effective indicator species for the site.
  
- Toxicity Reference Value (TRV): MacDonald (2009) used a study by Orn et al. (1998) to develop the TRV of 1.95 mg/kg wet weight for PCBs in fish. The study was based on zebrafish (*Danio rerio*) which, as a tropical freshwater species, does not occur in San Diego Bay, and therefore has questionable relevance to the marine fish species that reside in the bay. MacDonald first calculated a NOAEL<sub>10</sub> and LOAEL<sub>11</sub> for PCBs of 0.7 and 5.5 mg/kg dry weight, which spans a large range. He then calculated the TRV as the geometric mean of the NOAEL and LOAEL as 1.95 mg/kg. However, the mean value (i.e., 3.1 mg/kg) would have been considerably greater. In addition, in his October 2010 deposition, MacDonald stated that the TRV should have been 1.96 mg/kg (Page 236). Using a TRV of 1.96, the hazard quotient of 1.0 in Table 1 of MacDonald's expert report would decline to 0.99, which would remove the affected polygon from the high risk category defined by MacDonald (2009).
  
- Toxicity Endpoint: MacDonald selected reproduction as the endpoint for developing the TRV for PCBs, and developed the TRV based on ovary weight and the gonad somatic index (GSI). However, he ignored the fact that other reproductive endpoints (i.e., percentage spawning females, mean number of eggs per female, and median hatching time) showed no significant reductions in response to exposure to PCBs.
  
- Biota Sediment Accumulation Factor (BSAF): MacDonald used the BSAF of 1.61 determined for spotted sand bass at the Site in a memorandum by Zeeman (2004) that has not been published in the peer-reviewed literature.
  
- Lipid Content: MacDonald assumed that the lipid content of the gobies was 4 percent, based on the naked goby (*Gobiosoma bosc*), and presented in an unpublished presentation by Lederhouse et al. (2007).
  
- Moisture Content: MacDonald assumed a whole-body moisture content of 80 percent for fish, to convert the wet-weight PCB concentrations presented in Orn et al. (1998) to dryweight concentrations.

In summary, MacDonald predicted PCB concentrations in gobies, a species that does not occur at the Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on

sand bass, a lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above items has uncertainties attached to it, which MacDonald (2009) did not acknowledge or attempt to quantify. If all the uncertainties are combined, it is clear that hazard quotients only marginally greater than 1.0 cannot be considered indicative of high risk to fish with any degree of confidence.

Inspection of Table 1 of the MacDonald 3/11/11 Expert Report shows that all of the hazard quotients were relatively low (i.e., less than 2.6), with SW18 being less than 1.0 (i.e., using the corrected TRV of 1.96 mg/kg), four polygons being less than 1.3 (i.e., NA01, NA07, NA16, SW06), one polygon being less than 1.8 (i.e., NA04), and the final polygon being less than 2.6 (i.e., SW29). Given the multiple uncertainties that were not acknowledged or quantified in the hazard quotient analysis conducted by MacDonald (2009), none of these observed hazard quotients can be considered high enough to indicate a high risk to fish at the Site with any statistically meaningful certainty. In addition, the results for the spotted sand bass that were evaluated at the Site by Exponent (2003) provide additional support for the conclusion that none of these polygons require remediation based on risks to fish. Therefore, MacDonald's assertion that the six polygons pose high risks to fish and should be included in the remedial footprint at the Site is based on hypothetical and technically questionable analyses, and is inconsistent with the empirical data on fish collected from the site. His assertion is therefore invalid.

**Comment ID:** 175

**Organization:** BAE Systems

**DTR Section:** 33, Appendix for Section 33, Table A33-3

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

1. Conclusion C.3.1 that "Developing the Proposed Remedial Footprint using Thiessen Polygons...is a scientifically valid method....However, the polygons developed at the Shipyard Sediment Site using this method are unusually large" is Invalid (DTR § 33; DTR Appendix for Section 33, Table A33-3)

The DTR developed polygons for the Site based on the 60 stations sampled in 2001/2002. Conclusion C.3.1 of MacDonald 3/11/11 Expert Report states that "Developing the Proposed Remedial Footprint using Thiessen Polygons...is a scientifically valid method." "However, the polygons developed at the Shipyard Sediment Site using this method are unusually large."

This conclusion is invalid, as described in detail in the response to Comment C.2.1. That is, the station distribution scheme was consistent with the manner in which sampling is commonly conducted at most contaminated sediment sites, with the highest density of stations located near sources where the highest COC concentrations are expected, and with lower densities in areas



removed from the sources, where contaminants are expected to be more widely dispersed by waves and currents.

**Comment ID:** 176  
**DTR Section:** 33.1.2

**Organization:** BAE Systems

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald’s Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

2. Conclusion C.3.2 that “SWACs do not provide a basis for accurately assessing the impacts on benthic invertebrates or benthic fish” is Invalid (DTR § 33.1.2)

The DTR used SWACs to evaluate risks to fish and wildlife that may utilize the Shipyards Site. Conclusion C.3.2 of the MacDonald 3/11/11 Expert Report states that “SWACs do not provide a basis for accurately assessing the impacts on benthic invertebrates or benthic fish.”

This conclusion is invalid because SWACs are commonly used to evaluate risks to benthic fish at contaminated sediment sites, as they were at the Site. Contrary to MacDonald’s assertion, other tools were used to evaluate risks to benthic invertebrates at the Site, including evaluations of sediment chemistry, sediment toxicity, in situ benthic macroinvertebrate communities, measures of chemical bioavailability, contaminant breakdown products in fish bile, and fish histopathology.

**Comment ID:** 177  
**DTR Section:** 32.5, 32.5.1, 32.5.5, 33.1.3

**Organization:** BAE Systems

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald’s Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

3. Conclusion C.3.3 that “Evaluating risks to benthic invertebrates using a sediment quality triad (SQT) approach is a scientifically valid approach” and “the procedures described in the DTR for interpreting such data are not always consistent with the best current guidance” is Invalid (DTR §§ 32.5, 32.5.1, and 32.5.2; DTR Tables 32-17 through 32-22; DTR § 33.1.3; Table 33-2)

The methods used in the DTR to evaluate sediment at the Site were selected in large part to be consistent with those recommended by EPA, as well as those commonly used to evaluate contaminated sediment sites in the U.S. by sediment quality practitioners. Conclusion C.3.3 of MacDonald 3/11/11 Expert Report states that "Evaluating risks to benthic invertebrates using a sediment quality triad (SQT) approach is a scientifically valid approach." "The procedures described in the DTR for interpreting such data are not always consistent with the best current guidance."

This conclusion is invalid, as described in detail in the responses to Comments C.2.4, C.2.5, and C.2.6. The methods used for the Site are consistent with EPA guidance and with the methods commonly used at contaminated sediment sites. In addition, they are both conservative and protective of benthic macroinvertebrate communities at the site.

**Comment ID:** 178

**Organization:** BAE Systems

**DTR Section:** 32.5, 32.5.1, 32.5.2, 33.1.3

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

4. Conclusion C.3.4 that "Virtually all of the SQT stations evaluated had concentrations of contaminants that indicated the benthic invertebrates receive moderate to high exposure to contaminants at the Shipyard Sediment Site" is Invalid (DTR §§ 32.5, 32.5.1, and 32.5.2; DTR Tables 32-17 through 32-22; DTR § 33.1.3; Table 33-2)

The DTR used multiple lines of chemical and biological evidence to evaluate potential benthic impairment at the Site. Conclusion C.3.4 of MacDonald 3/11/11 Expert Report states that "Virtually all of the SQT stations evaluated had concentrations of contaminants that indicated the benthic invertebrates receive moderate to high exposure to contaminants at the Shipyard Sediment Site."

This conclusion is invalid because exposure of benthic macroinvertebrates to certain contaminant concentrations at a site does not necessarily imply that ecological effects will result, as MacDonald implies. A major reason for this lack of direct relationship between exposure and effects is that the bioavailability of contaminants at a site often is less than 100 percent. Despite the fact that consideration of contaminant bioavailability is a fundamental concept in sediment quality assessments (e.g., Ankley et al. 1996; Di Toro et al. 1991, 2001, 2005; Maruya et al. 2011), MacDonald failed to adequately consider it in the present expert report, as well as in his independent assessment of the remedial footprint for the Site (MacDonald 2009). During his

October 2010 deposition, MacDonald was asked if he considered contaminant bioavailability in preparing his footprint report and he replied: "I have not done an evaluation to determine whether or not one or more of the chemicals of potential concern or contaminants of concern at the Shipyard Sediment Site are more or less bioavailable than they are in other locations in San Diego Bay." Therefore, although it is considered essential by many sediment quality practitioners to evaluate chemical bioavailability when assessing sediment quality, MacDonald (2009) ignored this important consideration for the Site. This is a fundamental flaw in MacDonald (2009), and is contrary to the emphasis placed on evaluations of contaminant bioavailability at the site by Exponent (2003).

The fact that the SQT relies on two kinds of biological indicators, in addition to sediment chemistry, is related largely to uncertainties regarding contaminant bioavailability. A major use of the two kinds of biological indicators (i.e., sediment toxicity tests and evaluations of in situ benthic macroinvertebrate communities) is to determine whether the measured chemical concentrations in bulk sediment are sufficiently bioavailable to result in adverse ecological effects. Therefore, because the use of sediment contaminant concentrations as standalone indicators of sediment toxicity is invalid for definitive assessments of sediment quality, MacDonald's assertion is incorrect.

**Comment ID:** 179

**Organization:** BAE Systems

**DTR Section:** 18.3, Tables 18-7, 18-8, 18-9

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

5. Conclusion C.3.5 that "The calculations of the 95% prediction limits were unduly influenced by inclusion of data for reference sediment samples that had unacceptably low amphipod survival, bivalve normal development, and/or sea urchin fertilization...For the bivalve toxicity test endpoint, insufficient data were compiled to support calculation of a valid reference envelope" is Invalid (DTR § 18.3; DTR Tables 18-7, 18-8 and 18-9)

The DTR describes how the reference stations for the sediment toxicity tests were carefully selected to represent the range of chemical concentrations and biological responses found in areas removed from contaminant sources in San Diego Bay. Conclusion C.3.5 of MacDonald 3/11/11 Expert Report states that "The calculations of the 95% prediction limits were unduly influenced by inclusion of data for reference sediment samples that had unacceptably low amphipod survival, bivalve normal development, and/or sea urchin fertilization." "For the bivalve toxicity test endpoint, insufficient data were compiled to support calculation of a valid reference envelope."

These conclusions are invalid, as described in detail in the response to Comments C.2.6. The methods used for the Site are consistent with EPA guidance, as well as the methods commonly used to assess sediment toxicity at contaminated sediment sites in the U.S. In addition, as described in Section 17.2 of the DTR, the methods are “consistent with the San Diego Water Board’s goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination.” MacDonald’s assertion regarding the reference area data is therefore invalid.

**Comment ID:** 180

**Organization:** BAE Systems

**DTR Section:** 32.5.2, 33.1.3

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald’s Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

6. Conclusion C.3.6 that “The DTR switched assessment methods from the SQG1 to SS-MEQ to assess impacts on the benthic invertebrate community”, and “SS-MEQ does not provide an effects-based tool for predicting adverse effects on the benthic community” is Invalid (DTR § 32.5.2; DTR Table 32-21; DTR § 33.1.3; DTR Table 33-2; DTR Table 18-6)

The DTR describes how the SS-MEQ was developed to be an effects-based, site-specific indicator of potential benthic impairment at the Shipyards Site. Conclusion C.3.6 of MacDonald 3/11/11 Expert Report states that “The DTR switched assessment methods from the SQG1 to SSMEQ to assess impacts on the benthic invertebrate community”, and “SS-MEQ does not provide an effects-based tool for predicting adverse effects on the benthic community.”

This conclusion is invalid, as described in detail in the response to Comments C.2.4, in which it was shown that the SS-MEQ is an environmentally protective predictor of both nonlikely and likely impairment at the Site. The switch from the SQG1 to the SS-MEQ was justified because the SQG1 is based on generic sediment quality values that do not explicitly consider the site-specific conditions at the Site. By contrast, the SS-MEQ was based exclusively on chemical and biological data collected at the site and, therefore is a more appropriate site-specific sediment assessment tool than the SQG1.

MacDonald’s assertion that the SS-MEQ does not provide an effects-based tool for predicting adverse effects on benthic macroinvertebrate communities is incorrect, as the SS-MEQ was specifically developed to be a site-specific effects-based assessment tool. As described in Section 32.5.2 of the DTR, the SS-MEQ was developed using the median sediment concentrations of the primary COCs at Stations NA19, NA22, SW04, SW13, SW22, and SW23. Inspection of Table

18-1 of the DTR shows that this set of stations included all six of the likely impaired stations found at the Site. Therefore, calculation of the median COC concentrations from the six likely impaired stations at the Site was directly analogous to the manner in which Long et al. (1995) developed the ERM values. In addition, the predictive reliability of the SSMEQ was evaluated, and the threshold value of 0.9 was selected, using the site-specific effects determinations for the 30 Triad stations, as well as the 5 supplemental Triad stations sampled at the Site. MacDonald's assertion that the SS-MEQ is not effects-based is, therefore, invalid.

**Comment ID:** 181

**Organization:** BAE Systems

**DTR Section:** 33 Tables 33-1, 33-6, A33-1, A33-2, A33-3

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

7. Conclusion C.3.7 that "The Proposed Remedial Footprint excludes polygons with composite SWAC Ranking Values greater than 5.5" is

Invalid (DTR Tables 33-1 and 33-6; DTR Appendix for Section 33, Tables A33-1, A33-2 and A33-3)

The DTR describes how the selection of polygons to include in the remedial footprint was based on multiple lines of evidence. Conclusion C.3.7 of MacDonald 3/11/11 Expert Report states that "The Proposed Remedial Footprint excludes polygons with composite SWAC Ranking Values greater than 5.5."

This conclusion is invalid, as described in detail in the response to Comments C.2.3. The DTR clearly states on Page 33-1 that "The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentrations for the five primary COCs, site-specific median effects quotient (SS-MEQ) for non-Triad stations, and highest concentration of individual primary COCs." Therefore the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. MacDonald's assertion is, therefore, invalid.

**Comment ID:** 182

**Organization:** NASSCO

**DTR Section:** 28

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A.Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

e. A Tier II Risk Assessment Using Reasonable Assumptions Demonstrates That Even If Fish Were Caught Within The Shipyard, They Do Not Present A Significant Risk To Human Health (Finding 28)

Even if Staff assume that security restrictions do not make it impossible for the public to fish and collect shellfish in the NASSCO Shipyard, using realistic exposure estimates to prepare a Tier II Risk Assessment reveals that fish and shellfish caught at the NASSCO Shipyard do not pose a significant risk to human health. [Comment No. 199, TCAO, at 28, DTR, at 28, Appendix 28]. The Finley Report performs just this analysis, and concludes that a properly conducted Tier II Risk Assessment, with reasonable but conservative assumptions, demonstrates that fish and shellfish caught at the NASSCO Shipyard do not pose a significant risk to human health. Finley Report, at 23-28. Accordingly, the DTR and TCAO should be revised to incorporate this analysis, and the conclusion that human health beneficial uses are impaired should be removed. [Comment No. 200, TCAO, at 28, DTR, at 28, Appendix 28].

**Comment ID:** 183

**Organization:** BAE Systems

**DTR Section:** 33 Tables 33-1, 33-6, A33-1, A33-3

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald’s Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

8. Conclusion C.3.8 that “The Proposed Remedial Footprint excludes polygons, like NA07, with concentrations of contaminants in sediment that likely pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the Proposed Remedial Footprint” is Unsupported (DTR Tables 33-1 and 33-6; DTR Appendix for Section 33, Tables A33-1, A33-2 and A33-3)

Conclusion C.3.8 of MacDonald 3/11/11 Expert Report states that “The Proposed Remedial Footprint excludes polygons, like NA07, with concentrations of contaminants in sediment that likely pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the Proposed Remedial Footprint.” However, MacDonald provided no technical basis for this assertion in Section C.2.

**Comment ID:** 184

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

9. Conclusion C.3.9 that "Proposed Remedial Footprint excludes polygons with concentrations of contaminants in sediment that likely pose high risks to benthic fish" is Invalid (DTR § 33)

The DTR describes how the remedial footprint was developed to be protective of fish, in addition to other ecological receptors. Conclusion C.3.9 of MacDonald 3/11/11 Expert Report states that "The Proposed Remedial Footprint excludes polygons with concentrations of contaminants in sediment that likely pose high risks to benthic fish."

This conclusion is invalid, as described in detail in the response to Comments C.2.9. The fish species selected for detailed evaluation at the Site (i.e., spotted sand bass) was appropriate because it preys primarily on benthic macroinvertebrates, exhibits limited spatial movements, and is abundant in numerous kinds of habitats within San Diego Bay. By contrast, MacDonald conducted a hypothetical evaluation of a species (i.e., goby) that was not found at the Site during fish collection efforts, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, a lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Because each of the above items has uncertainties attached to it, which MacDonald did not acknowledge or attempt to quantify, the results of MacDonald's hypothetical evaluation are highly questionable, and cannot be interpreted with any degree of confidence. MacDonald's assertion that the remedial footprint does not include polygons that likely pose a high risk to benthic fish is therefore invalid.

**Comment ID:** 185

**Organization:** BAE Systems

**DTR Section:** 33.1.1

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

10. Conclusion C.3.10 that "The Proposed Remedial Footprint excludes polygons of portions of polygons, like NA20, NA21, and NA22, which are being considered in the Mouth of Chollas Creek TMDL" and "The TMDL process will not provide a vehicle for remediating contaminated sediment" is Invalid (DTR § 33.1.1)

The DTR describes how portions of the Site were removed from the site because they will be addressed in a separate TMDL evaluation. Conclusion C.3.10 of MacDonald 3/11/11 Expert Report states that "The Proposed Remedial Footprint excludes polygons or portions of polygons, like NA20, NA21, and NA22, which are being considered in the Mouth of Chollas Creek TMDL." "The TMDL process will not provide a vehicle for remediating contaminated sediment."

This conclusion is invalid, as described in detail in the response to Comments C.2.7. The decision to remove these polygons from the Site was an administrative decision, rather than a technical decision, and therefore does not require technical justification as MacDonald implies. In addition, because MacDonald is not participating in the design of the TMDL process for these polygons he has no direct knowledge of what the process will include. Therefore, MacDonald's assertion that the manner in which these polygons will be addressed is both invalid and uninformative.

**Comment ID:** 186

**Organization:** BAE Systems

**DTR Section:** 33.1.4, Table 33-6

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

11. Conclusion C.3.11 that "In order to be scientifically valid, these conclusions of technical infeasibility must be supported by detailed engineering studies" is Invalid (DTR Table 33-6; DTR § 33.1.4)

The DTR describes how potential remediation of several polygons was considered technically infeasible. Conclusion C.3.11 of MacDonald 3/11/11 Expert Report states that "In order to be scientifically valid, these conclusions of technical infeasibility must be supported by detailed engineering studies."

This conclusion is invalid, as described in detail in the response to Comments C.2.8. MacDonald's assertion regarding the determinations of technical infeasibility are invalid, because those determinations were made by a group comprised of multiple parties with a range of backgrounds and expertise, including resource agencies and shipyard operations personnel. In addition, there is no formal requirement that engineering studies be conducted to make a determination of technical infeasibility. In addition, none of the affected polygons warranted inclusion in the remedial footprint, regardless of concerns related to technical feasibility. MacDonald's statement regarding technical infeasibility is therefore invalid, and ultimately irrelevant based on the chemical and biological indicators measured in the affected polygons.



**Comment ID:** 187

**Organization:** NASSCO

**DTR Section:** 12

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

B. The Tentative Cleanup and Abatement Order Is Technically Infeasible to Achieve Because Uncontrolled Sources Of Pollution Unrelated To NASSCO Are Impacting Sediment At The Shipyard (Findings 12, 30, 32, 33)

Contrary to Staff's conclusion in Finding 30 of the TCAO, it is neither technically feasible, nor prudent, to carry out the proposed cleanup while uncontrolled sources of pollution continue to impact the Site. See TCAO, at ¶ 30, DTR, at 30-7. [Comment No. 201, TCAO, at 30, DTR, at 30, 32.7.1]. Chollas Creek has been recognized as contributing to the accumulation of pollutants observed in marine sediments at the Site, and is not expected to be fully controlled for decades. Deposition of Craig Carlisle ("Carlisle Depo"), at 200:5-200:13. [Comment No. 202, TCAO, at 12, 33, DTR, at 12.1, 33.1.1]. If source control of Chollas Creek is not achieved before the cleanup is conducted, pollutants from Chollas Creek "could influence contaminant levels in sediment" and possibly cause the Site to become recontaminated. Barker Depo, 172:4 – 174:11. [Comment No. 203, TCAO, at 33, DTR, at 33.1-33.4].

Regulators have long recognized that "control[ing] other sources of contamination is crucial to successful remediation, regardless of the remedy selected, and should be implemented by regulatory agencies as a component of remedial action." Committee on Contaminated Marine Sediments, National Research Council, Contaminated Marine Sediments: Assessment and Remediation (1989), at 15, 17, 29. Ideally, source control should be achieved prior to active remediation because "the long-term effectiveness of any remedial option can be reduced if sediment transport acts to recontaminate the site." Interim Guide for Assessing Sediment Transport at Navy Facilities, SAR373164; see also Transcript, Meeting, State of California Lands Commission (October 20, 2007) (statement of Sylvia Rios), at 248:18 – 250:1 ("It is reasonable to conclude that storm water/urban runoff is now the most significant contributor of contamination into San Diego Bay. It is also reasonable to conclude that ongoing contamination from urban runoff must be resolved in order to effectively address the sediment contamination in this area. To do . . . otherwise, . . . is . . . to simply spend large amounts of money cleaning sediment of the bay only to find that stormwater runoff from upland sources has over time recontaminated the same area that has just been cleaned."). [Comment No. 204, TCAO, at 12, DTR, at 12.1].

**Comment ID:** 188

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

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V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

12. General Conclusion #1 that "The results of an independent evaluation of the available data and information that I performed in 2009 indicate that additional polygons should be included in the sediment remedial footprint for the Shipyard Sediment Site (MacDonald 2009)" is Invalid (DTR § 33)

The DTR provides detailed justification as to why each polygon at the Site was or was not included in the remedial footprint. General Conclusion #1 of MacDonald 3/11/11 Expert Report states that "The results of an independent evaluation of the available data and information that I performed in 2009 indicate that additional polygons should be included in the sediment remedial footprint for the Shipyard Sediment Site (MacDonald 2009).

This conclusion is invalid, because the methods, results, and conclusions of MacDonald (2009) have come under severe technical criticism both at his October 2010 deposition, and in follow-up expert reports. The use of that report to justify that additional polygons should be included in the remedial footprint is therefore inappropriate from a technical standpoint.

**Comment ID:** 189

**Organization:** BAE Systems

**DTR Section:** 33.1 to 33.1.4, Tables 33-1 to 33-6

**Comment:**

V. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION C OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 33; DTR § 33)

B. Responses to MacDonald's Conclusions Regarding the Proposed Remedial Footprint (DTR § 33)

13. General Conclusion #2 that "The following polygons pose unacceptable risks to fish and would likely or possibly adversely affect the benthic community: NA01, NA04, NA07, NA16, SW06, SW18, and SW29" and "In addition, polygon NA22 should be included in the Remedial Footprint because it...is not valid to exclude it based on its consideration in the TMDL process for the Mouth of Chollas Creek" is Invalid (DTR §§ 33.1 through 33.1.4; DTR Tables 33-1 through 33-6).

The DTR provides detailed justification as to why each polygon at the Site was or was not included in the remedial footprint. General Conclusion #2 of MacDonald 3/11/11 Expert Report states that "The following polygons pose unacceptable risks to fish and would likely or possibly adversely affect the benthic community: NA01, NA04, NA07, NA16, SW06, SW18, and SW29." "In addition, polygon NA22 should be included in the Remedial Footprint because it...is not valid to exclude it based on its consideration in the TMDL process for the Mouth of Chollas Creek."

This conclusion is invalid with respect to fish, as described in detail in the response to Comment C.2.9, and also in abbreviated form in the response to Conclusion C.3.9. With respect to benthic macroinvertebrate communities, the comment is invalid because multiple site-specific indicators of sediment quality showed that the polygons do not pose risks to benthic macroinvertebrate communities, as follows:

- NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.
- NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ values (0.69) was less than the threshold value of 0.9.
- NA07: Not likely impaired based on Triad analysis.
- SW06: Not likely impaired based on the supplemental Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ values (0.63) was less than the threshold value of 0.9.
- SW18: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.62) was less than the threshold value of 0.9.
- SW29: No primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.71) was less than the threshold value of 0.9

Based on the information presented above, MacDonald's assertions that the six polygons pose risks to fish, and potentially risks to benthic macroinvertebrate communities, are both invalid.

**Comment ID:** 190

**Organization:** NASSCO

**DTR Section:** 4

**Comment:**

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IV.THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

B.The Tentative Cleanup and Abatement Order Is Technically Infeasible to Achieve Because Uncontrolled Sources Of Pollution Unrelated To NASSCO Are Impacting Sediment At The Shipyard (Findings 12, 30, 32, 33)

1.To The Extent Minor Impacts Are Observed, Shipyard Contaminants Are Not The Source (Findings 4, 14-18, 30, 32, 33)

Sediment conditions at the Site are generally favorable; however, to the extent minor impacts are observed at NASSCO, triad results suggest that contaminants from Chollas Creek, not the shipyards, are linked to the observed environmental impacts. Ginn Report, at 44-45. [Comment No. 206, TCAO, at 4, DTR, at 4.3.1, 4.5, 4.7]. For example, stations NA20 and NA22—which are not associated with shipyard-related chemicals, but are within the area of apparent sediment

deposition from the Chollas Creek storm water plume—are the only stations in the NASSCO leasehold with apparent benthic effects under the DTR analysis. *Id.* [Comment No. 207, TCAO, at 33, DTR, at 33.1-33.4]. Further, as discussed in detail below, toxicity results indicate that the observed sediment toxicity is correlated with pesticides, rather than shipyard chemicals.

a. There Is No Correlation Between Concentrations of Shipyard Contaminants And Sediment Toxicity (Findings 14 – 18)

Chemicals potentially associated with the shipyards are generally not correlated with sediment toxicity and benthic macroinvertebrate community effects, even where such chemicals are present in concentrations above reference—suggesting that observed toxicity and benthic effects are not due to shipyard chemicals. Exponent Report, at 13-2. [Comment No. 208, TCAO, at 14-18, DTR, at 14-18]. Moreover, there are no demonstrable causal relationships between shipyard-associated chemicals and observed biological effects. *Id.*; see also DTR, at Table 20-1. [Comment No. 209, TCAO, at 14-18, DTR, at 14-18].

b. Correlations Are Observed Between Pesticide Concentrations And Sediment Toxicity (Findings 14 – 18)

By contrast, there is clear evidence that pesticides—which are not shipyard-associated chemicals—may be responsible for adverse biological effects observed at the shipyards, particularly adverse effects to bivalves. Exponent Report, at 9-6 – 9-7. [Comment No. 210, TCAO, at 18, DTR, at 4.7.1.3, 18.1-18.5]. Pesticide concentrations, specifically of chlordanes and DDTs, are more strongly correlated with impacts to aquatic life (including adverse effects on bivalve development and bivalve abundance) than are any of the shipyard-associated chemicals. *Id.* [Comment No. 211, TCAO, at 4, 18, DTR, at 4.7.3, 4.7.1.3, 18.1-18.5]. These results are consistent with the results of the SFEI Study, which also found correlations between pesticide concentrations and sediment toxicity in San Diego Bay, and suggest that observed toxicity responses, particularly at NA20 and NA22, are attributable to Chollas Creek. Exponent Report, at 9-6 – 9-7, 13-2; Thompson et al., *Estimated Sediment Contaminant Concentrations Associated with Biological Impacts at San Diego Bay Clean-up Sites*, at 6 (Jul. 2009) (“[C]hlordanes and DDTs had the highest correlations with all biological and SQO indicators.”); *Cleanup Team’s Responses and Objections to Designated Party NASSCO’s Second Set of Requests For Admissions (“Response to NASSCO’s RFAs”)*, at RFA No. 28 (admitting that correlations between pesticide concentrations in sediment and sediment toxicity have been observed in San Diego Bay). [Comment No. 212, TCAO, 18, DTR, at 18.1-18.5].

c. Uncontrolled Sources of Contamination Unrelated to NASSCO Impact the Shipyard (Findings 4, 30, 32, 33)

Taken together, these results confirm that uncontrolled storm water and municipal separate storm sewer discharges, have impacted, and will continue to impact, the shipyard. DTR, at 4-1, et seq. [Comment No. 213, TCAO at 4, 30, 32, 33 DTR, at 4.1-4.7.3, 30, 32.7, 33.1.1]. Moreover, as discussed below, the ongoing Chollas Creek TMDL proceedings indicate that such discharges are unlikely to be controlled for decades:

(1) Urban Runoff From Chollas Creek Is A Significant Contributor Of Pollutants To The Shipyard (Findings 4, 30, 32, 33)

Significant regulatory efforts aimed at addressing conditions at Chollas Creek affirm that Chollas Creek is heavily polluted and a significant contributor of metals, pesticides, and other pollutants to sediments at the Site. DTR, at 4-1, 4-19. Since 1994, Chollas Creek storm water samples have frequently exceeded Basin Plan narrative water quality objectives for toxicity, and California Toxics Rule criteria for copper, lead, and zinc. DTR, at 4-12. As a result, Chollas Creek was placed on the Clean Water Act Section 303(d) List of Water Quality Limited Segments in 1996 for cadmium, copper, lead, zinc, and toxicity, with zinc, copper, and diazinon subsequently identified as causes of observed toxicity. Chollas Creek TMDL for Metals, Background, (available at [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/tmdls/chollascreekmetals.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/chollascreekmetals.shtml)). It was also designated as a priority hot spot due to the presence of copper, DDT, chlordane, and diazinon in the sediments, and the presence of impacts to aquatic life. SDRWQCB, Proposed Regional Hot Spot Cleanup Plan (Dec. 1997), at 1-16; Exponent Report, at 1-16 -1-17. In 2002 and 2005, respectively, TMDLs were adopted for diazinon and metals in Chollas Creek, and the Regional Board is currently in the process of developing TMDLs for PCBs, PAHs, and chlordane at the mouth of Chollas Creek. Id.

These TMDLs and other regulatory efforts document severe pollution problems in Chollas Creek that ultimately affect the Site, since “each season’s major storms will effectively remove any metals accumulated in the creek sediment and transport then downstream to San Diego Bay.” Total Maximum Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek Tributary to San Diego Bay, Draft Technical Report (Dec. 1997), at 1-16. [Comment No. 214, TCAO, at 4, DTR, at 4.7.12]. Such plumes “are toxic to marine life and can introduce a large fraction of the total storm event’s production of suspended solids, copper, zinc, and lead to the Shipyard Sediment Site through settling of particles.” DTR, at 4-10; see also Barker Depo, at 921:14 – 922:15 (confirming that storm water outflows from Chollas Creek have contributed to the accumulation of pollutants in marine sediment at the Shipyard Sediment Site, and reach the inner portion of the leasehold). [Comment No. 215, TCAO, at 4, 30, 32, 33, DTR, at 4.1-4.7, 30, 32.7, 33.1.1]. Further, there is evidence that these discharges could influence the inner portions of the leasehold, including the areas slated for remediation. Barker Depo, at 923:8 – 923:15 (confirming that NA19, NA06, NA15 and NA17 are potentially subject to influence from Chollas Creek); Carlisle Depo, at 104:5 – 105:3 (same). [Comment No. 216, TCAO, at 4, 30, 32, 33, DTR, at 4.1-4.7, 30, 32.7, 33.1.1].

(2) Observed Toxicity And Benthic Community Effects Are Attributable To Discharges Of Municipal Storm Water (Findings 4, 14 – 18, 30, 32, 33)

Notably, the toxicity and benthic community hits described in the DTR occur at stations located in the vicinity of Chollas Creek or other discharges of municipal storm water, suggesting that non-shipyard sources are responsible for observed impacts to sediments at NASSCO. DTR, at Table 18-8; DTR at 4-5. By contrast, sediment toxicity is not statistically associated with shipyard chemicals; thus, elevated concentrations of shipyard chemicals (as measured by exceedance of LAET) were determined not to be the cause of any observed reductions in beneficial uses. Exponent Report, at 18-5. [Comment No. 217, TCAO, at 4, 15, 16, 18, DTR, at 4, 15, 16, 18]. Instead, the presence of pesticides, and the observed correlations between pesticides and toxicity, suggest that Chollas Creek and storm sewer discharges from areas outside the shipyards are contributing toxic levels of pesticides (and other chemicals) to shipyard sediments, and are responsible for any observed effects. Exponent Report, at 13-2 – 13-3, 18-5;

see also DTR, at 4-19. [Comment No. 218, TCAO, at 4, 30, 32, 33, DTR, at 4.1-4.7, 30, 32.7, 33.1.1].

**Comment ID:** 191

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

BAE Systems responds to the comments and conclusions of the MacDonald 3/11/11 Expert Report contained in Section “D” entitled “Expert Opinion #2: Alternative Cleanup Levels which states:

Limitations on the establishment and implementation of the Alternative Clean-Up Levels make it difficult to determine if San Diego Bay beneficial uses will be unreasonably affected by the post-remedial contamination levels. To assure that beneficial uses are protected, Remediation Monitoring and Post Remedial Monitoring must be improved to ensure that the Shipyard Sediment Site is remediated to the Alternative Clean-Up Levels.

(MacDonald 3/11/11 Expert Report, at p. 18.)

**Comment ID:** 192

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

B. The Tentative Cleanup and Abatement Order Is Technically Infeasible to Achieve Because Uncontrolled Sources Of Pollution Unrelated To NASSCO Are Impacting Sediment At The Shipyard (Findings 12, 30, 32, 33)

2. Remediation Goals Cannot Be Met Due To Re-Contamination From Other Sources (Findings 30, 32, 33, 36)

It is axiomatic that source control should be achieved prior to active remediation of sediment. See, e.g., Resolution 92-49, at ¶ III.E.1; EPA’s Contaminated Sediment Management Strategy, EPA-823-R-98-001 (Apr. 1998), at 54 (recognizing pollution prevention and source control as methods that will allow contaminated sediments to recover naturally without unacceptable impacts to beneficial uses). [Comment No. 219, TCAO, at 36, DTR, at 36.4].

As discussed above, the administrative records both in this proceeding and the various Chollas Creek TMDL proceedings demonstrate unequivocally that Chollas Creek is adversely impacting sediments at NASSCO. See Section III. B. 1. supra. [Comment No. 220, TCAO, at 4, 30, 32,

33, DTR, at 4.1-4.7, 30, 32.7, 33.1.1]. Staff also admits that discharges from Chollas Creek impact sediment quality within the leasehold, that pesticide discharges to San Diego Bay are uncontrolled and correlated with toxic effects, and that sediment at NASSCO is adversely affected by sources of pollution unrelated to NASSCO or its operations. Response to NASSCO's RFAs, at 11, 13, 15, 17. [Comment No. 221, TCAO, at 4, 30, 32, 33, DTR, at 4.7.1.3, 4.7.3, 30, 32.7, 33.1.1]. However, despite extensive regulatory efforts, it is clear that complete source control cannot, and will not, be achieved in the foreseeable future. No reductions are required under the Chollas Creek metals TMDL until 2018, and full compliance is not required until October of 2028. Barker Depo, at 925:19 – 927:25 (admitting that Chollas Creek TMDL is not expected to be fully implemented until 20 years after adoption, and that no reduction is required for the first ten year period). [Comment No. 222, TCAO, at 12, DTR, at 12.1]. Further, it is “probable” that full compliance with the TMDLs will not be achieved within the timeframe set forth in the TMDL, because existing technology cannot reliably meet the TMDL and is cost-prohibitive. Deposition of Benjamin Tobler (“Tobler Depo”), at 90:6 – 92:5 (“[W]ithout getting into space-age technology, which is extremely cost-prohibitive, the only possible fix for the problem is sand filters. Sand filters do filter out metals, but even sand filters only get you into the general ballpark for meeting compliance. In other words, the best sand filters right now only just barely get you to the ballpark of compliance. There’s no margin of safety with it.”). [Comment No. 223, TCAO, 30, DTR, at 30.1-30.2]. Thus, according to Staff, it is “probable” that full compliance will not be achieved, even after 20 years and significant infrastructure improvements, “unless technology comes to the rescue.” Id. [Comment No. 224, TCAO, at 12, DTR, at 12.1].

In sum, it is nonsensical to require massive dredging of site sediments before sources are fully controlled. Failing to fully implement source control risks recontamination from upland sources and Chollas Creek, and may end up requiring enormous sums of public and private money to be spent on successive CAOs, without achieving significant permanent changes in sediment conditions. (footnote) [Comment No. 225, TCAO, at 4, 30, 32, 33, DTR, at 4.7.1.3, 4.7.3, 30, 32.7, 33.1.1, 33.4].

(footnote) A prime example of the need for source control prior to remediation is the Convair Lagoon site: after significant funds were expended constructing a cap to remediate PCBs, PCBs were subsequently found on top of the cap, due to incomplete source control. The Board must avoid the risk of repeating a similar outcome at NASSCO by ensuring that Chollas Creek and other municipal storm water discharges are fully controlled prior to any active remediation.

**Comment ID:** 193

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald’s Comments Regarding “Uncertainties Associated with the Alternative Clean-Up Levels” (TCAO Finding 32; DTR § 32)

MacDonald argues the “appropriateness and protectiveness of the Alternative Clean-Up Levels described in Section 32 of the TCAO and Finding 32 of the DTR are uncertain for several reasons” and proceeds to set forth comments. (Id.) BAE Systems responds to each comment.

1. Comment D.2.1 that “The Alternative Clean-Up Levels are substantially higher than background levels of the primary COCs in San Diego Bay” is Unsupported and Invalid (TCAO Finding 32; DTR § 32)

MacDonald states that “Clean-Up Levels that correspond with background conditions in San Diego Bay would provide the highest, practically achievable, level of protection to ecological receptors utilizing habitats in the vicinity of the Shipyard Sediment Site.” However, because he fails to evaluate or even define his term “practically achievable”, he provides no support for his assertion. By contrast the DTR provided extensive evaluations of both the protectiveness of the Alternative Cleanup Levels, as well as the technical and economic feasibility of cleaning up the entire site to background levels.

As stated in Section 32.2.3 of the DTR, “Protectiveness of the beneficial uses represented by aquatic-dependent wildlife and human health was assessed via estimation of post-remedial SWAC values of the remedial footprint. Post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint would be remediated to background concentrations.” The protectiveness of this approach for aquatic dependent wildlife was then evaluated, and it was concluded that “HQs for all receptors evaluated at the Site had a value less than 1.0 (Table 32-8), indicating that the COCs are unlikely to cause adverse ecological effects and that the post-remedial sediment chemistry conditions are protective of aquatic dependent wildlife and their associated beneficial uses.” In addition, in Section 31 of the DTR, it was determined that “Based on these incremental costs versus incremental benefit comparisons, cleanup to background sediment quality levels is not economically feasible.” Based on the considerations discussed above, the SWAC values identified in Section 32 of the DTR were selected as the Alternative Cleanup Levels for the Site (see Table 2 of the TCAO). It therefore is appropriate that the Alternative Cleanup Levels exceed background values, and MacDonald’s assertion is invalid.

**Comment ID:** 194

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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V.MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

A.Natural Attenuation Is Occurring And Should Be The Preferred Remedy (Findings 30, 36)

Resolution 92-49 provides that, in determining the appropriate cleanup level, the Regional Board shall take into account the demands being made and to be made on the waters and the total values involved—beneficial and detrimental, economic and social, and tangible and intangible. Resolution 92-49 does not require, however, that the requisite level of water quality be met at the time of site closure; rather, a site may be closed if the level will be attained “within a reasonable



time frame,” such as through monitored natural attenuation. Resolution 92-49, at III.A. [Comment No. 226, TCAO, at 36, DTR, at 36.4]. Site conditions and factors conducive to monitored natural attenuation include: (1) the presence of relatively low contaminant levels; (2) evidence that natural attenuation is occurring, or is reasonably certain to occur; (3) bioavailability and toxicity to benthic organisms under current conditions; (4) site activities and anticipated land uses; (5) stable sediment beds; and (6) the ability to monitor sediment concentrations and limit short-term exposure during the recovery period. DTR, at 30-2, Gibson Depo, at 151:1 – 153:8, 152:14 – 153:9; Attachment B, Exponent Memorandum (May 25, 2011). Based on these factors, monitored natural attenuation following source control is the appropriate remedy for the Site for the following reasons [Comment No. 227, TCAO, at 30, DTR, at 30.1.1].:

**Comment ID:** 195

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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#### V.MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

A.Natural Attenuation Is Occurring And Should Be The Preferred Remedy (Findings 30, 36)

1.Source Control Issues Affect All Potential Primary Remedies (Findings 4, 30, 32, 34)

The DTR acknowledges that monitored natural attenuation is a “readily employable and proven remediation strateg[y],” and that natural recovery processes are “active” at the Site. DTR, at 30-1, 30-3; see also Barker Depo, at 255:19 – 256:1. Although, Staff did not recommend natural recovery as the primary remedy for the Site because “[c]omplete control of site sources has not been fully demonstrated to a level that would assure adequate rates of recovery,” Staff’s “person most knowledgeable” on the issue testified that recontamination from off-site sources would affect all potential remedies. DTR, at 30-3; Barker Depo, at 278:6 – 279:2. Thus, lack of source control should not serve to favor dredging, at the expense of monitored natural attenuation. Barker Depo, at 278:6 – 279:2. [Comment No. 228, TCAO, at 4, 30, 32, 34, DTR, at 4.3, 4.7, 30, 32.7, 34.4].

**Comment ID:** 196

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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#### V.MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

A.Natural Attenuation Is Occurring And Should Be The Preferred Remedy (Findings 30, 36)

2.The 2009 Testing Demonstrates That Natural Attenuation Is Occurring (Findings 30, 32, 36)

Recent testing conducted by Exponent on behalf of the Parties in 2009 (“2009 Testing”) confirms that the already favorable sediment conditions observed in 2002 are improving through natural attenuation. [Comment No. 229, TCAO, at 30, 32, DTR, at 30.1.1, 32.2 – 32.6]. Specifically, the 2009 Testing indicates that the SWACs for the five primary contaminants of

concern have decreased substantially since 2001/2002, and in many cases are only slightly higher than post-remedial SWACS, suggesting that Staff's cleanup goals can be achieved in a reasonable time through monitored natural attenuation. Barker Depo, Ex. 1228. [Comment No. 230, TCAO, at 30, 32, DTR, at 30.1.1, 32.2 – 32.6]. In fact, for the locations sampled in 2009, which were selected because they are considered representative of site-wide conditions, three of the five SWACs for primary contaminants of concern have already attained the post-remedial SWACs that would be required by the TCAO, and the remaining two are only slightly above the post-remedial SWACs. [Comment No. 231, TCAO, at 30, 32, DTR, at 30, 32].

For example, the copper SWAC at the five 2009 Testing stations decreased from 183.3 mg/kg in 2001/2002 to 167.8 mg/kg in 2009, representing an 8.5% decrease attributable to monitored natural attenuation. Barker Depo, Ex. 1228, at A. Further, the 2009 copper SWAC for these locations was only slightly higher than the required post-remedial SWAC of 159 mg/kg, suggesting that Staff's site-wide cleanup goals are likely to be achieved for copper in a reasonable time simply by allowing natural attenuation to continue. *Id.* The results are even more dramatic with respect to other primary contaminants of concern, where the 2009 sampling data showed that: (1) the mercury SWAC has decreased by 49% to 0.8 mg/kg, only slightly above the required post-remedial SWAC of 0.68 mg/kg; (2) the HPAH SWAC has decreased by 18.8% to 2,293.3 ug/kg, and is actually lower than the required post-remedial SWAC of 2,451 ug/kg indicating that the post-remedial HPAH SWAC has already been achieved for at least five stations via natural processes; (3) the PCB SWAC has decreased by 23.6% to 188.7 ng/g, which is already lower than the required SWAC of 194 ng/g indicating that the post-remedial PCB SWAC has already been achieved for at least five stations via natural processes; and (4) the TBT SWAC has decreased by 71.6% to 23.3 ug/kg and is already substantially lower than the required post-remedial SWAC of 110 ug/kg indicating that the post-remedial TBT SWAC has already been achieved for at least five stations via natural processes. *Id.* at B – E. In fact, the latter data for TBT is also consistent with previous Regional Board findings at the Commercial Basin boatyards, where TBT was found to naturally degrade quickly and was therefore not actively remediated. RWQCB Order No. 88-79, at ¶¶ 18- 19. [Comment No. 232, TCAO, at 30, 32, 36, DTR, at 30, 32, 36.4].

Additionally, NASSCO incorporates by reference the arguments and evidence submitted by BAE with respect to the AMEC sampling conducted in late 2010, which shows similar results as the 2009 Testing and further confirms that natural attenuation is occurring at the Site. [Comment No. 233, TCAO, at 30, 32, 36, DTR, at 30, 32, 36.4].

Based on these data, it is clear that on a SWAC basis, natural remediation is already occurring at the site for all five primary contaminants of concern, suggesting that Staff's proposed cleanup levels will be achieved in a reasonable time without active dredging. [Comment No. 234, TCAO, at 30, 32, DTR, at 30, 32]. This is particularly true considering that natural attenuation is occurring despite the physical disturbances associated with shipyard activities. Since Site contaminants are also not generally bioavailable, and toxicity to benthic organisms under current conditions is low, the Site is a prime candidate for natural attenuation. Because natural attenuation is already occurring and is expected to achieve the cleanup levels in the TCAO within a reasonable time, requiring dredging would be inappropriately conservative. [Comment No. 235, TCAO, at 18, 19, 30, 32, DTR, at 18, 19, 30, 32].

**Comment ID:** 197

**Organization:** NASSCO

**DTR Section:** 30

**Comment:**

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V. MONITORED NATURAL ATTENUATION IS THE PROPER REMEDY

A. Natural Attenuation Is Occurring And Should Be The Preferred Remedy (Findings 30, 36)

3. Site-Specific Circumstances Support Monitored Natural Attenuation As The Preferred Remedy (Finding 18, 23-24, 27-28, 30)

In addition to the fact that monitored natural attenuation is already occurring, the following site-specific circumstances support monitored natural attenuation as the preferred remedy for the Site:

a. The NASSCO Site Will Remain A Secured Shipyard Until At Least 2040 (Findings 28, 30)

The fact that NASSCO will remain a secured shipyard until at least 2040 supports implementation of monitored natural attenuation because security measures will prevent human exposure to site contaminants and wildlife during the recovery period. Exponent Report, at 18-6; Finley Report, at 6. [Comment No. 236, TCAO, at 28, 30, DTR, at 28.2, 30]. Additionally, the demands being made, and to be made, on the waters at the Site, given its use as an active shipyard, also support monitored natural attenuation. [Comment No. 237, TCAO, at 28, 30, DTR, at 28.2, 30].

Based on the operative land use plans, NASSCO property is required to be used for marine-oriented industrial uses, and is classified as prime industrial land. Finley Report, at 3; Alo Depo, at 106:21 – 107:8. Further, under the terms of NASSCO's current lease, NASSCO will remain a secured shipyard until at least 2040. Attachment C, San Diego Unified Port District Lease to NASSCO, and Amendments thereto ("Lease"). As an active industrial facility, the shipyard does not permit fishing, swimming, recreation, or other such uses at the Site. Armed military personnel, and other safeguards, including a 300 foot security boom, ensure that these restrictions are enforced. [Comment No. 238, TCAO, at 28, 30, DTR, at 28.2, 30]. Moreover, there is no indication that NASSCO will be used as a recreational area in the foreseeable future, indicating that existing security measures will continue to prevent exposure to humans during the recovery period. See Finley Report, at 3. [Comment No. 239, TCAO, at 28, 30, DTR, at 28.2, 30]. It is both common and appropriate to take these types of land use considerations into account in choosing an appropriate remedy. Alo Depo, at 107:23 – 108:6, 109:4 – 109:7. Yet, the TCAO is based upon conservative assumptions that account for recreational, and other uses that are simply not relevant to the Site, especially considering that monitored natural attenuation is expected to remediate the sediments to the proposed levels long before NASSCO's lease expires. [Comment No. 240, TCAO, at 12, 18, 23-24, 27-28, 30, DTR, at 12, 18, 23-24, 27-28, 30].

**Comment ID:** 198

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

2. Comment D.2.2 that "Neither the TCAO nor the DTR explicitly identify numerical Alternative Clean-Up Levels for the protection of aquatic life" is Invalid (TCAO Finding 32; DTR § 32) MacDonald states that "Without evidence in the record demonstrating that potential for adverse effects on fish were considered, I conclude that the Alternative Clean-Up Levels were developed without considering the potential for adverse impacts on fish." This assertion is invalid since extensive evaluations of risks to fish were evaluated at the Site, using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). MacDonald's assertion is therefore invalid.

**Comment ID:** 199

**Organization:** BAE Systems

**DTR Section:** 32, Table 18-7

**Comment:**

VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

3. Comment D.2.3 that "The Alternative Clean-Up Levels fail to include numerical limits to protect benthic macroinvertebrates" is Invalid (TCAO Finding 32; DTR § 32; DTR Table 18-7) MacDonald states that "The metric for evaluating sediment chemistry data in the non-Triad samples is not effects based." He then identifies the SS-MEQ as the metric he is referring too. However, as discussed in detail in the previous response to MacDonald's Conclusion C.3.6, the SS-MEQ was developed in the DTR to be a site-specific, effects-based, protective tool for evaluating benthic impairment. MacDonald's assertion is therefore invalid.

MacDonald also states the reference pool used to evaluate the results of the 10-d amphipod test was invalid because it included several survival values less than 80 percent. However, as discussed in detail in the previous response to MacDonald's Comment C.2.6, the group of stations included in the reference pool was appropriate, because they were relatively uncontaminated and represented the range of sediment chemical concentrations and biological responses found in areas located away from contaminant sources in San Diego Bay. MacDonald's assertion is therefore invalid.

MacDonald also states that the reference pools for the bivalve and echinoderm sediment toxicity tests were invalid because the bivalve reference pool included only four stations, and the

echinoderm reference pool included two samples with fertilization rates of less than 70 percent. Aside from the justifications identified for the amphipod test above, the results for the bivalve and echinoderm tests identified in the DTR were identical to those found by Exponent (2003), using a different reference pool for the echinoderm test and a different statistical procedure for both tests (i.e., analysis of variance in the Exponent report and a reference-envelope approach in the DTR).

That is, both studies found no significant effects for the echinoderm test, and significant effects at the same 12 stations for the bivalve tests. These results show that the statistical results for both of these tests were robust, since they were the same using two methods of analysis. MacDonald's assertion that the results for those two tests were invalid is therefore incorrect.

**Comment ID:** 200

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

4. Comment D.2.4 that "The Alternative Clean-Up Levels fail to include numerical limits to protect fish" is Invalid (TCAO Finding 32; DTR § 32) MacDonald states the "My analysis of data from the Shipyard Sediment Site indicates that benthic fish are at risk throughout portions of the site and at least seven polygons were not included in the Proposed Remedial Footprint that had unacceptable risks to fish (MacDonald 2009)." However, as describe in detail in the previous response to MacDonald's Comment C.2.9, his analysis of risk to fish suffered from numerous flaws and uncertainties. Briefly, MacDonald predicted PCB concentrations in gobies, a species that does not occur at the Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, a lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above "assumptions" has uncertainties attached to it, which MacDonald (2009) did not acknowledge or attempt to quantify. By contrast with MacDonald's hypothetical analysis of risk to fish, empirical data collected at the Site were evaluated for the spotted sand bass by Exponent (2003) and unacceptable risks were not found. MacDonald's assertion regarding risks to fish at the Site is therefore invalid.

**Comment ID:** 201

**Organization:** BAE Systems

**DTR Section:** 32, 34

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

5. Comment D.2.5 that "The shortcomings of the Alternative Clean-Up Levels lead to uncertainties in the protectiveness of the remediation. This problem can be addressed, at least in part, by setting stringent Remediation and Post Remedial Monitoring requirements" is Invalid (TCAO Findings 32 and 34; DTR §§ 32 and 34).

The TCAO and DTR presently include detailed and extensive remediation and post remedial monitoring requirements. In addition, additional monitoring details will be proposed and reviewed in the Remedial Monitoring Plan, which will be prepared within 90 days from adoption of the CAO. MacDonald's concern with respect to the monitoring requirements is therefore invalid.

**Comment ID:** 202

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

A. Responses to MacDonald's Comments Regarding "Uncertainties Associated with the Alternative Clean-Up Levels" (TCAO Finding 32; DTR § 32)

6. Comment D.2.6 that "The TCAO provides no evidence that the cleanup of the remedial footprint will restore any injury, destruction or loss of natural resources" is Unwarranted and Invalid (TCAO Finding 32; DTR § 32)

MacDonald states that Section 32 of the TCAO "concludes that the proposed remedial action will restore any natural resources that may have been injured by releases of hazardous substances at the Shipyard Sediment Site", and that the Regional Board "has not conducted a natural resource damage assessment at the Shipyard Sediment Site and, hence, has no basis for making this assertion." MacDonald also states that the Regional Board "does not have authority for conducting natural resource damage assessments", and that "all statements regarding the injury to natural resources, natural resource service losses, and associated damages must be removed from the TCAO and DTR."

MacDonald's assertions are an unwarranted extrapolation of a single mention of "natural resources" in the TCAO, in which it simply states that "Cleanup of the remedial footprint will restore any injury, destruction, or loss of natural resources." The statement in no way addresses service losses, monetary damages, or any of the other parameters unique to natural resource damage assessments. The statement simply articulates that the cleanup of the remedial footprint at the Site will improve environmental conditions such that natural resources like those evaluated in detail at the Site (i.e., benthic macroinvertebrates, fish, and aquatic dependent wildlife) will

benefit. Contrary to MacDonald's statements, the DTR and TCAO have extensively evaluated many of the adverse effects that are defined as injuries in a natural resource damage assessment, such as exceedances of sediment quality guidelines, sediment toxicity, bioaccumulation, fish histopathology, and risks to wildlife from contaminated prey. It should also be noted a number of the items present in the DTR and TCAO were developed in cooperation with Natural Resource Trustees, including U.S. Fish and Wildlife Service, California Department of Game, and the National Oceanographic and Atmospheric Administration. Many of MacDonald's assertions are administrative jurisdictional comments. MacDonald lacks the qualifications to render comments regarding jurisdictional issues. MacDonald's assertions are therefore unwarranted and invalid.

**Comment ID:** 203

**Organization:** BAE Systems

**DTR Section:** 32, 34

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

B. Responses to MacDonald's Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34)

1. Conclusion D.3.1 that "It is essential that the Remediation Monitoring program provide a reliable basis for documenting the water quality standards have been violated outside the construction area during remedial activities" is Unsupported and Invalid (TCAO Findings 32, 34; DTR §§ 32, 34)

As described in more detail in responses related to MacDonald's Section E (infra), the remedial monitoring program for the Site provides a reliable basis for monitoring water quality during remediation, and will be further developed and enhanced after the Remediation Monitoring Plan is submitted within 90 days after the CAO is adopted.

**Comment ID:** 204

**Organization:** BAE Systems

**DTR Section:** 32, 34

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

B. Responses to MacDonald's Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34)

2. Conclusion D.3.2 that "It is essential that the Remediation Monitoring program...provide a reliable basis for documenting that the target

clean-up levels for sediment have been reached within the remedial footprint and that the remedial activities have not further contaminated areas located outside the remedial footprint” Is Unsupported and Invalid (TCAO Findings 32, 34; DTR §§ 32, 34)

As described in more detail in responses related to MacDonald’s Section E (infra), the remedial monitoring program for the Site provides a reliable basis for monitoring sediment quality during remediation, and will be further developed and enhanced after the Remediation Monitoring Plan is submitted within 90 days after the CAO is adopted.

**Comment ID:** 205  
**DTR Section:** 32, 34

**Organization:** BAE Systems

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

B. Responses to MacDonald’s Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34)

3. Conclusion D.3.3 that “It is essential that the Remediation Monitoring program provide data of sufficient quality and quantity to determine if the Alternative Clean-Up Levels have been met at the Shipyard Sediment Site following implementation of remedial measures” is Unsupported and Invalid (TCAO Findings 32, 34; DTR §§ 32, 34)

As described in more detail in responses related to MacDonald’s Section F, the post remedial monitoring program for the Site provides a reliable basis for ensuring that the Alternative Cleanup Levels are met following remediation.

**Comment ID:** 206  
**DTR Section:** 32, 34

**Organization:** BAE Systems

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

B. Responses to MacDonald’s Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34)

4. Conclusion D.3.4 that “It is essential that the San Diego Regional Board be prepared to require additional remediation if the Alternative Clean-Up Levels have not been met following completion of the remedial activities at the site” is Unsupported and Premature (TCAO Findings 32, 34; DTR §§ 32, 34)



The Regional Board will be able to use the extensive amount of information provided by the post remedial monitoring program to evaluate the success of the remediation, and to determine what, if any, additional actions may be warranted.

**Comment ID:** 207

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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VI. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION D OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 32; DTR § 32)

B. Responses to MacDonald's Conclusions Regarding the Alternative Clean-Up Levels (TCAO Findings 32, 34; DTR §§ 32, 34)

5. Conclusion D.3.5 that "The Natural Resource Trustees may conduct a natural resource damage assessment to evaluate injuries to natural resources" is Inappropriate and Unsupported.

MacDonald lacks the qualification to render any opinions regarding what the Natural Resource Trustees may or may not do, and, therefore, his conclusion is inappropriate.

**Comment ID:** 208

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

BAE Systems responds to the comments and conclusions of the MacDonald 3/11/11 Expert Report contained in Section "E" entitled "Expert Opinion #3: Remediation Monitoring", which states:

The requirements for Remediation Monitoring, as specified in Section B.1.1 of the TCAO and in Section 34.1 of the DTR, do not mandate development and implementation of a Remediation Monitoring Plan that will provide the data and information needed to assess compliance with water quality standards, to evaluate the effectiveness of remedial measures, or to identify the need for further dredging to achieve clean-up goals at the Shipyard Sediment Site. Therefore, the Remediation Monitoring requirements must be revised to address each of these issues.

(MacDonald 3/11/11 Expert Report, at p. 21.)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

1. Comment E.2.1 that “water quality impacts can be adequately assessed only by comparing results of real-time monitoring of turbidity and dissolved oxygen and sampling of contaminants of concern” is Invalid (TCAO Finding 34; DTR § 34)

The DTR specifies that real-time monitoring of turbidity and dissolved oxygen will be conducted within 250 and 500 ft of construction area, with the 250-ft samples representing an early warning of potential problems and the 500-ft samples representing the point of compliance.

In addition, prior to monitoring, a model of turbidity and synoptic water quality measures will be developed for ambient conditions to ensure that turbidity is an appropriate parameter for evaluating water quality. Contaminants of concern will not be sampled directly because, in part, real-time measurements would not be possible. Instead, turbidity and dissolved oxygen concentrations will be used as surrogate measurements to determine whether water quality standards are likely to be violated in real time. This monitoring scheme is considered both appropriate and effective.

**Comment ID:** 209

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

2. Comment E.2.2 that “The DTR allows Dischargers to take all water quality samples from up-current locations which would mask true water quality impacts” is Premature and Unsupported (DTR § 34.1.1) The locations of the water quality monitoring stations will be determined during preparation of the Remedial Action Plan (RAP), which will be prepared within 90 days from adoption of the CAO. The Remediation Monitoring Plan will be part of the RAP, and the detailed locations of the water quality monitoring stations will be proposed and reviewed for technical adequacy as part of that submittal. The details and justification of the proposed locations will be provided in that document.

**Comment ID:** 210

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

2. Comment E.2.2 that “The DTR allows Dischargers to take all water quality samples from up-current locations which would mask true water quality impacts” is Premature and Unsupported (DTR § 34.1.1) The locations of the water quality monitoring stations will be determined during preparation of the Remedial Action Plan (RAP), which will be prepared within 90 days from adoption of the CAO. The Remediation Monitoring Plan will be part of the RAP, and the detailed locations of the water quality monitoring stations will be proposed and reviewed for technical adequacy as part of that submittal. The details and justification of the proposed locations will be provided in that document.

**Comment ID:** 211

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

3. Comment E.2.3 that “The DTR's failure to define the size of the construction area means that samples can be collected far from the locus of the dredging activity” is Premature and Unsupported (DTR § 34.1.1) The detailed locations of the water quality monitoring stations will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan. Details such as the definition of the construction area will be provided in that submittal.

**Comment ID:** 212

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

4. Comment E.2.4 that “The DTR fails to provide the rationale for collecting water samples at a depth of 10 feet” is Premature and Unsupported (DTR § 34.1.1) The final specification for sampling depth(s) for water quality monitoring will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 213

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

5. Comment E.2.5 that “Dischargers are free to collect samples at times when daily water quality impacts are likely to be the lowest and mask the true water quality impacts during remediation” is Premature and Unsupported (DTR § 34.1.1) The time of day at which samples will be collected for water quality monitoring will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 214

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

6. Comment E.2.6 that “The DTR's fails to require collection of water samples on at least a daily basis” is Premature and Unsupported (DTR § 34.1.1) The final temporal sampling frequency and strategy will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 215

**Organization:** BAE Systems

**DTR Section:** 34.1.1

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Water Quality (TCAO Finding 34; DTR § 34)

7. Comment E.2.7 that “The DTR's fails to define best management practices for dredging activities” is Premature and Unsupported (DTR

§ 34.1.1) The best management practices for dredging activities at the Site will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 216

**Organization:** BAE Systems

**DTR Section:** 34.1.2

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

1. Comment E.3.1 that “The DTR allows Dischargers to collect only one sediment sample from each polygon in the Proposed Remedial Footprint, which will not provide sufficient data to assess compliance with clean-up goals” is Premature and Unsupported (DTR § 34.1.2)  
The final sampling scheme for sediment monitoring will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 217

**Organization:** BAE Systems

**DTR Section:** 34.1.2

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

2. Comment E.3.2 that “The DTR fails to identify the locations that must be sampled to confirm that clean-up goals have been met” is Premature and Unsupported (DTR § 34.1.2) The final sampling scheme for sediment monitoring will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 218

**Organization:** BAE Systems

**DTR Section:** 34.1.2

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

3. Comment E.3.3 that "The TCAO and the DTR provide inconsistent requirements on sampling depth" is Premature and Unsupported (DTR § 34.1.2) Any inconsistencies regarding sampling depth will be resolved when the in the Remediation Monitoring Plan is prepared.

**Comment ID:** 219  
**DTR Section:** 34.1.2

**Organization:** BAE Systems

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

4. Comment E.3.4 that "The DTR should specifically require that samples be collected within the top 10 cm" is Premature and Unsupported (DTR § 34.1.2) The sediment sampling depth for remediation monitoring will be finalized when the Remediation Monitoring Plan is prepared and reviewed by the Regional Board.

**Comment ID:** 220  
**DTR Section:** 34.1.2

**Organization:** BAE Systems

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

5. Comment E.3.5 that "The DTR's 120% of background trigger level for additional dredging is ambiguous and arbitrary" is Premature and Unsupported (DTR § 34.1.2) The 120% of background trigger levels recognizes natural variability in sediment chemical concentrations. As stated in Section 34 of the DTR, "Environmental data has natural variability which does not represent a true difference from expected values. Therefore, if remedial monitoring results are within an acceptable range of the expected outcome, the remedial actions will be considered successful." The details of how this trigger level will be applied will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 221

**Organization:** BAE Systems

**DTR Section:** 34.1.2

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald’s Comments Regarding Deficiencies of the Remediation Monitoring Requirements – Sediment (DTR § 34.1.2)

6. Comment E.3.7 that “The DTR fails to specify the criteria when a sand cap would be necessary and who would make such a determination” is Premature and Unsupported (DTR § 34.1.2)

The details of how and when the application of sand caps will be made will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan. In addition, the Regional Board will oversee any decisions regarding application of sand caps.

**Comment ID:** 222

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

C. Responses to MacDonald’s Conclusions Regarding the Remediation Monitoring Program (DTR § 34)

1. Comment E.4.1 that “The DTR must include detailed requirements for surface-water sampling” is Premature and Unsupported (DTR § 34)

The details of the surface-water monitoring program will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 223

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION E OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

C. Responses to MacDonald’s Conclusions Regarding the Remediation Monitoring Program (DTR § 34)

2. Comment E.4.2 that “The DTR must make...changes to the sediment portion of the Remediation Monitoring program” is Premature and Unsupported (DTR § 34)

The details of the sediment monitoring program will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

**Comment ID:** 224  
**DTR Section:** 34.2

**Organization:** BAE Systems

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

BAE Systems responds to the comments and conclusions of the MacDonald 3/11/11 Expert Report contained in Section “F” entitled “Expert Opinion #4: Post Remedial Monitoring”, which states:

The requirements for Post Remedial Monitoring, as specified in Section D of the TCAO and in Section 34.2 of the DTR, do not mandate development and implementation of a Post Remedial Monitoring Plan that will provide the data and information needed to determine if the remaining pollutant concentrations in the sediments will not unreasonably affect San Diego Bay beneficial uses. In other words, the current Post Remedial Monitoring requirements do not require collection of the data and information needed to evaluate the effectiveness of remedial measures and identify the need for further remediation to achieve clean-up goals at the Shipyard Sediment Site. Therefore, Post Remedial Monitoring results will not provide a comprehensive basis for objectively evaluating the effectiveness of the remedial measures or the need for further remediation to achieve the clean-up goals at the Shipyard Sediment Site. (MacDonald 3/11/11 Expert Report, at p. 28.)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

1. Comment F.2.1 that “Neither the TCAO nor the DTR establish narrative remedial action objectives (RAOs) for each San Diego Bay beneficial use” is Untrue (DTR § 34.2)

The remedial action objectives are stated as the Alternative Cleanup Levels in Section 32 of the TCAO. For the protection of aquatic life, the objective is to “remediate all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community” (see Table 2 of the TCAO). To protect aquatic dependent wildlife and human health, the objective is to achieve the site-wide sediment SWACs for the five primary COCs that are specified in Table 2 of the TCAO.



**Comment ID:** 225

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

2. Comment F.2.2 that "It is not clear that attainment of the Remedial Goals...ensure that San Diego Bay beneficial uses will not be unreasonably affected by sediment-associated contaminants at the Shipyard Sediment Site" is Invalid (TCAO § D.3.c.1)

The specifications described in Section D of the TCAO on how the monitoring results for sediment chemistry, sediment toxicity, and bioaccumulation will be evaluated are objective, quantitative, and environmentally protective. They will therefore ensure that beneficial uses in San Diego Bay will be protected in the future.

**Comment ID:** 226

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

3. Comment F.2.3 that "The procedures that are prescribed for calculating Site-Wide SWACs will not provide the data required to determine the concentrations of COCs within each polygon at the Shipyard Sediment Site" is Incorrect (TCAO § D)

As stated in Section D of the TCAO, sediment chemistry and sediment toxicity will be evaluated at five stations distributed throughout the remedial footprint to evaluate the success of the remediation with respect to benthic macroinvertebrates. In addition, subsamples of sediment from the 65 stations used for the compositing analysis will be archived for potential future analysis. Therefore, the SWAC results based on the compositing of sediments will not be the only method by which the effectiveness of the remediation will be assessed.

**Comment ID:** 227

**Organization:** BAE Systems

**DTR Section:** 32.2.1, 34.2

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

4. Comment F.2.4 that "Compositing surface sediment into six polygon groups is inappropriate because it will mask the true extent of contamination remaining at the Shipyard Sediment Site" is Invalid (DTR §§ 32.2.1, 34.2)

The stratification scheme described in Section 32.2.1 of the DTR will subdivide the overall Site into six polygon groups, thereby allowing SWACs to be calculated for those different subsections of the site, as well as for the overall site. This stratification scheme will provide valuable interpretive information on the spatial distribution of COC concentrations throughout the site, that would not be available if only a single site-wide SWAC was evaluated. The six polygon groups include three polygons in each of the northern and southern halves of the overall site, and the three polygons within each half of the overall site represent the remedial footprint, the polygons adjacent to or proximal to the remedial footprint, and the polygons distant from the footprint. Therefore, contrary to MacDonald's assertion, the stratification and compositing scheme specified in the DTR will document the true spatial extent of COC concentrations throughout the Site, rather than mask that distribution. MacDonald's assertion is therefore invalid.

**Comment ID:** 228

**Organization:** BAE Systems

**DTR Section:** 34.2

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

5. Comment F.2.5 that "The 0-2 cm horizon is not the appropriate sediment depth to sample to evaluate attainment of conditions that support beneficial uses" is Incorrect (DTR § 34.2)

The 0-2 cm sediment horizon is appropriate because it will allow direct comparisons of chemical concentrations and sediment toxicity results with pre-remediation sediment data, because the latter data was also generated using the 0-2 cm horizon. In addition, the 0-2 cm sediment horizon will provide a more sensitive indicator of potential re-contamination of the remediated areas, as the chemical concentrations in any newly deposited sediment will be minimally diluted by concentrations in the underlying sediment.

**Comment ID:** 229

**Organization:** BAE Systems

**DTR Section:** 34.2.1

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

6. Comment F.2.6 that "Collecting replicate sub-samples of composite sediment samples is not an appropriate method of evaluating the effectiveness of remedial monitoring" is Incorrect (DTR § 34.2.1)

The subsampling and replication scheme described in Section D of the TCAO is appropriate to meet the stated objective as follows: "the three replicate sub-samples of composite samples provide an estimate of variances in the compositing process." This kind of information is very useful, because homogenizing a solid matrix such as sediment is difficult, and sometimes incomplete. The subsampling scheme will therefore improve the estimates of the COC concentrations in each of the polygon groups and thereby facilitate the evaluations of remedy effectiveness.

**Comment ID:** 230

**Organization:** BAE Systems

**DTR Section:** 34.2.2, Table 34-1

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

7. Comment F.2.7 that "Trigger Concentrations for Primary COCs...will not effectively identify conditions at the Shipyard Sediment Site that unreasonably affect San Diego Bay beneficial uses" is Invalid (TCAO § D.1.c.6; DTR § 34.2.2; DTR Table 34-1)

MacDonald states that "The Trigger Concentrations are likely to be relatively unhelpful...because they are not based on the concentrations of COCs that need to be achieved to support attainment of the beneficial uses." However, in Section 34.2.2 of the DTR it is stated that "These concentrations represent the surface-area weighted average concentration expected after cleanup, accounting for the variability in measured concentrations throughout the area", and that "it is critical to account for the natural variability of the predicted post-remedial SWAC." Therefore, the Trigger Concentrations were developed appropriately with the realistic

recognition that measurements of sediment chemical concentrations always are associated with some degree of error. MacDonald's assertion is therefore invalid.

**Comment ID:** 231

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

8. Comment F.2.8 that "Neither the TCAO nor the DTR provided the rationale for collecting sediment samples at nine sampling stations...to support bioaccumulation testing" is Incorrect (TCAO, Attachments 3 and 4)

Inspection of Attachments 3 and 4 of the TCAO show that the nine stations selected for bioaccumulation analysis are distributed along the entire length of the remedial footprint, and thereby will provide a relatively complete assessment of potential bioaccumulation throughout the site.

**Comment ID:** 232

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

9. Comment F.2.9 that "The criteria presented in the TCAO for interpreting the results of the bioaccumulation tests...are not effects-based" is Irrelevant (TCAO § D)

The bioaccumulation criteria specified in Section D of the TCAO were designed to document that bioaccumulation levels are responding the sediment remediation and are showing a decreasing trend in Year 2, relative to post-remediation levels, and decreasing or continuous trends in Years 5 and 10. The bioaccumulation evaluations were therefore designed appropriately for their intended use.

**Comment ID:** 233

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

10. Comment F.2.10 that "The requirements for collecting and analyzing sediment samples for evaluating sediment chemistry for benthic exposure and sediment toxicity are inadequate" is Invalid (DTR § 34)

The five stations selected for evaluations of sediment chemistry and toxicity were the only five stations in the remedial footprint found to have likely impairment based on the Triad analyses described in the DTR (see Section 18 of the DTR). Therefore they represent the highest priority areas for remediation and are appropriately identified for monitoring of sediment chemistry and toxicity to evaluate benthic exposure. It should also be recognized that subsamples of sediment from all 65 polygons will be archived as part of the sediment compositing analysis, and will therefore be available for future chemical analysis if necessary.

**Comment ID:** 234

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

11. Comment F.2.11 that "Neither the TCAO nor the DTR present decision rules that describe how the sediment chemistry data generated in the Post Remedial Monitoring program will be used to inform decisions on the need for further actions at the site" is Incorrect (TCAO § D)

In Section D of the TCAO, the decision rule for sediment chemistry is identified as "sediment chemistry below SS-MEQ and the 60% LAET thresholds." If these criteria are not achieved, the Regional Board will then evaluate whether further actions at the site are warranted.

**Comment ID:** 235

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

A. Responses to MacDonald's Comments Regarding Deficiencies of the Post Remedial Monitoring Requirements (TCAO Finding 34; DTR § 34)

12. Comment F.2.12 that "Neither the TCAO nor the DTR present decision rules that describe how the sediment toxicity data generated in the Post Remedial Monitoring program will be used to inform decisions on the need for further actions at the site" is Incorrect (TCAO § D)

In Section D of the TCAO, the decision rule for sediment toxicity is identified as "toxicity not significantly different from conditions at the reference stations described in Finding 17." If this criterion is not achieved, the Regional Board will then evaluate whether further actions at the site are warranted.

**Comment ID:** 236

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

1. Conclusion F.3.1 that "Narrative remedial action objectives and specific indicators of attainment of those objectives...should be included in the TCAO" is Incorrect (TCAO Finding 34; TCAO § D; DTR § 34)

The remedial action objectives are stated as the Alternative Cleanup Levels in Section 32 of the TCAO, and the indicators of attainment are presented in Table 2 and Section D of the TCAO.

**Comment ID:** 237

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

2. Conclusion F.3.2 that “Sediment samples should be collected from all 66 polygons and evaluated for sediment chemistry to provide the data needed to determine if the site-wide SWAC for the five priority COCs have been met. The sediment samples should not be composited” is Invalid (TCAO Finding 34; TCAO § D; DTR § 34)

Subsamples of sediment from all 65 polygons will be archived as part of the sediment compositing analysis, and will therefore be available for future chemical analysis if necessary. In addition the five stations selected for evaluations of sediment chemistry and toxicity were the only five stations in the remedial footprint found to have likely impairment based on the Triad analyses, and therefore represent the highest priority areas for monitoring of sediment chemistry and toxicity to evaluate benthic exposure.

**Comment ID:** 238

**Organization:** BAE Systems

**DTR Section:** 32, 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald’s Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

3. Conclusion F.3.3 that “Sediment samples for evaluating attainment of the Alternative Clean-Up Levels should be collected from the 0-10 cm horizon to better reflect the biologically active zone in San Diego Bay” is Unsupported (TCAO Findings 32, 34; DTR §§ 32, 34)

The 0-2 cm sediment horizon was selected for monitoring because it will allow direct comparisons of chemical concentrations and sediment toxicity results with pre-remediation sediment data. In addition, the 0-2 cm sediment horizon will provide a more sensitive indicator of potential re-contamination of the remediated areas than would the 0-10 cm horizon.

**Comment ID:** 239

**Organization:** BAE Systems

**DTR Section:** 34.2.2, Table 34-1

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald’s Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

4. Conclusion F.3.4 that “Trigger concentrations should be revised to correspond to the post-remedy SWACs for the five primary COCs” is Invalid (DTR § 34.2.2; DTR Table 34-1)

As discussed in the response to Comment F.2.7, the Trigger Concentrations were developed appropriately with the realistic recognition that measurements of sediment chemical concentrations always are associated with some degree of error. MacDonald's assertion is therefore invalid

**Comment ID:** 240

**Organization:** BAE Systems

**DTR Section:** 19, 32, 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

5. Conclusion F.3.5 that "The rationale for selecting the nine sampling locations for bioaccumulation testing should be provided. In addition, bioaccumulation testing should include a 56-day time-to-steady-state test" is Unsupported (TCAO Findings 19, 32, 34; DTR §§ 19, 32, 34)

The nine stations selected for bioaccumulation analysis are distributed along the entire length of the remedial footprint, and thereby will provide a relatively complete assessment of potential bioaccumulation throughout the site. In addition, the 28-day bioaccumulation test with *Macoma nasuta* proved to be an effective tool for evaluating bioaccumulation in the DTR, so there is no need for the 56-day test.

**Comment ID:** 241

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

6. Conclusion F.3.6 that "Biological-effects based criteria should be established for interpreting the results of the bioaccumulation tests" is Incorrect (TCAO § D)

The bioaccumulation criteria specified in Section D of the TCAO were designed to document that bioaccumulation levels are responding the sediment remediation and were therefore designed appropriately for their intended use.



**Comment ID:** 242

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

7. Conclusion F.3.7 that "The number of polygons that are sampled for evaluating sediment chemistry, sediment toxicity, and benthic invertebrate community structure must be increased to include all of the polygons included in the Proposed Remedial Footprint and all of the polygons that are located adjacent to the footprint polygons" is Unsupported (TCAO Findings 34; DTR § 34)

The five stations selected for evaluations of sediment chemistry and toxicity were the only five stations in the remedial footprint found to have likely impairment based on the Triad analyses, represent the highest priority areas for remediation, and are therefore appropriately identified for monitoring of sediment chemistry and toxicity to evaluate benthic exposure. In addition, subsamples of sediment from all 65 polygons will be archived as part of the sediment compositing analysis, and will therefore be available for future chemical analysis if necessary.

**Comment ID:** 243

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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VIII. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION F OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO FINDING 34; DTR § 34)

B. Responses to MacDonald's Conclusions Regarding the Post Remedial Monitoring Requirements (TCAO Finding 34. TCAO § D; DTR § 34)

8. Conclusion F.3.8 that "The decision rules that will be used to determine the need for further action...must be clarified" is Unsupported (TCAO § D)

In Section D of the TCAO, the decision rule for sediment chemistry is identified as "sediment chemistry below SS-MEQ and the 60% LAET thresholds", and the decision rule for sediment toxicity is identified as "toxicity not significantly different from conditions at the reference stations described in Finding 17." If these criteria are not achieved, the Regional Board will then evaluate whether further actions at the site are warranted.

**Comment ID:** 244

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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IX. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

BAE Systems responds to the comments and conclusions of the MacDonald 3/11/11 Expert Report contained in Section “G” entitled “Expert Opinion #5: Trigger Exceedance Investigation” which states:

The Trigger Exceedance Investigation and Characterization process, described in Section D.4 of the TCAO, will not provide a basis for compelling the Dischargers to conduct further remediation to achieve clean-up goals at the Shipyard Sediment Site.

(MacDonald 3/11/11 Expert Report, at p. 33.)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

1. Comment G.2.1 that “Exceedance of the Trigger Concentrations does not trigger further remedial actions” is Invalid (TCAO § D.4). MacDonald states that exceedance of one or more Trigger Concentrations leads to an investigation of the exceedance rather than “automatically triggering additional clean-up”, and that “By giving the Dischargers discretion to follow-up on exceedances of Trigger Concentrations using various methods other than additional clean-up, it is virtually certain that additional remedial work will not be conducted.” MacDonald’s “deduction” to an exceedance of a Trigger Concentration is unfounded and amounts to supposition. As stated in Section D of the TCAO, the purpose of the Trigger Exceedance Investigation and Characterization is “to determine the cause(s) of the exceedance” and to recommend “an approach, or combination of approaches, for addressing the exceedance(s).” The TCAO therefore lays out a rational approach with numerous details to evaluate the underlying cause of any exceedance of a Trigger Concentration, so that it can be addressed in the present, and prevented in the future. The Regional Board will review all of this information and determine the best path forward. MacDonald’s assertion that the process is flawed is invalid.

**Comment ID:** 245

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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IX. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

2. Comment G.2.2 that “The DTR and TCAO fail to establish Trigger Concentrations based on the Alternative Clean-Up Levels for aquatic life” is Invalid (TCAO § D.4) MacDonald states that Trigger Exceedance Investigation and Characterization process “ignores exceedances of the effect threshold for benthic invertebrates and the potential effects on fish.” MacDonald fails to recognize that, as described in Section D of the TCAO, post remedial monitoring will be conducted using a variety of other indicators not directly related to the SWAC trigger concentrations. Those indicators are bioaccumulation evaluations using *Macoma nasuta*, sediment chemistry, sediment toxicity using both the amphipod and bivalve tests, and evaluation of in situ benthic macroinvertebrates communities. All of these indicators will be measured at multiple stations throughout the remedial footprint and all of them will provide information related to potential effects on benthic macroinvertebrates and benthic-feeding fish. MacDonald’s assertion is therefore invalid.

**Comment ID:** 246

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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IX. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

3. Comment G.2.3 of MacDonald (2011) states that “Trigger Concentrations have been established for five COCs only” is Invalid (TCAO § D.4) MacDonald states that the Trigger Exceedance Investigation and Characterization process focuses on the five primary COCs, and “ignores exceedances of toxicity thresholds for other chemicals.” However, MacDonald fails to recognize that, as documented in the DTR, the five primary COCs were the primary risk drivers at the Site because they exhibited the highest exceedances with respect to toxicity thresholds. In addition the secondary COCs were highly correlated with the primary COCs, such that they are addressed in a common remedial footprint. In addition, as documented in Section D of the TCAO, the evaluations of sediment chemistry to assess benthic exposure will determine concentrations of arsenic, cadmium, chromium, lead, nickel, silver, zinc, and LPAHs, in addition to the five primary COCs. MacDonald’s assertion is therefore invalid.

**Comment ID:** 247

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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IX. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

A. Responses to MacDonald’s Comments Regarding Deficiencies of the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

4. Comment G.2.4 of MacDonald (2011) states that “The Trigger Concentrations...may not provide an effective basis for evaluating the potential for adverse effect...because they are statistically based values, rather than effect-based values” is Invalid (TCAO § D.4) As previously discussed in the response to Comment F.2.7, the Trigger Concentrations were developed appropriately with the realistic recognition that measurements of sediment chemical concentrations always are associated with some degree of error. MacDonald’s assertion is therefore invalid.

**Comment ID:** 248

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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IX. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

B. Responses to MacDonald’s Conclusions Regarding the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

1. Conclusion G.3.1 that “The Dischargers should not be given authority to make recommendations regarding the actions that will be taken to address exceedances of the Trigger Concentrations” but “Rather, the San Diego Regional Board must retain the authority to review the data and make such decisions” is Invalid (TCAO § D.4) The TCAO lays out a rational approach with numerous details for evaluating the cause of any exceedances of the Trigger Concentrations, so that it can be addressed in the present, and prevented in the future. The Regional Board will review all of this information and determine the best path forward. MacDonald’s conclusion is therefore invalid.

**Comment ID:** 249

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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X. RESPONSES TO COMMENTS AND CONCLUSIONS IN SECTION G OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

B. Responses to MacDonald’s Conclusions Regarding the Trigger Exceedance Investigation and Characterization Process (TCAO § D.4)

2. Conclusion G.3.2 that “The TCAO should clearly identify the actions that need to be taken if the Trigger Concentrations are exceeded” is Invalid (TCAO § D.4) As stated above, the TCAO lays out a rational approach for evaluating the cause of any exceedances of the Trigger Concentrations, and for determining the best path forward. Because it is not possible to a priori anticipate and address all possible contingencies with respect to exceedances of Trigger Concentrations and their possible causes, as MacDonald acknowledges in his conclusion, it is unrealistic to a priori identify the actions that need to be taken if the Trigger Concentrations are exceeded. MacDonald’s conclusion is therefore invalid.

**Comment ID:** 250

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

BAE Systems responds to the recommendations of the MacDonald 3/11/11 Expert Report contained in Section “H” entitled “Summary of Recommendations” which states:

there are a number of important deficiencies in these documents that have the potential to compromise the effectiveness of the cleanup and the monitoring programs that will be conducted to assess its sufficiency. The following recommendations are provided to assist the San Diego Regional Board in revising the TCAO and DTR in a manner that serves the long-term public interest relative to the Shipyard Sediment Site.

(MacDonald 3/11/11 Expert Report, at p. 35.)

1. Recommendation H.1 that polygons NA01, NA04, NA07, NA16, NA22, SW06, SW18, and SW29 be included in the remedial footprint is Invalid and Should Not be Adopted (TCAO Finding 33, Attachments 2, 3, 4; DTR § 33)

As discussed previously, none of the eight polygons identified by MacDonald warrants inclusion in the remedial footprint. He erroneously identified Polygon NA06 as being excluded from the remedial footprint when, in fact, it is included in the footprint (see Attachment 4 of the TCAO). In addition, MacDonald erroneously listed Polygon NA16 twice. The reasons why the remaining six polygons in the above list were not included in the remedial footprint are found in various sections of the DTR and are summarized below:

NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.

NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.

NA07: Not likely impaired based on Triad analysis.

NA16: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.69) was less than the threshold value of 0.9.

NA22: Addressed in a separate process for the Mouth of Chollas Creek TMDL.

SW06: Not likely impaired based on the supplemental Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ values (0.63) was less than the threshold value of 0.9.

SW18: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.62) was less than the threshold value of 0.9.

SW29: No primary COCs exceeded their 60% LAET values, the SS-MEQ value (0.71) was less than the threshold value of 0.9.

MacDonald's recommendation to include any of the above eight polygons is therefore invalid.

**Comment ID:** 251

**Organization:** BAE Systems

**DTR Section:** 34, 35

**Comment:**

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X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

2. Recommendation H.2 that the Remediation Monitoring requirements for surface water should be revised in include a variety of additional details is Unnecessary and Should Not be Adopted (TCAO Findings 34, 35; DTR §§ 34, 35)

As discussed previously, the TCAO specifies that a Remedial Action Plan (RAP) will be prepared within 90 days from adoption of the CAO, and that the Remediation Monitoring Plan will be part of the RAP. The Remediation Monitoring Plan will include numerous additional details on the water quality monitoring program that will be reviewed for technical adequacy by the Regional Board. Because these additional details will be provided in the Remediation Monitoring Plan, MacDonald's recommendation that they be provided in the TCAO is unnecessary.

**Comment ID:** 252

**Organization:** BAE Systems

**DTR Section:** 34, 35

**Comment:**

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X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

3. Recommendation H.4 that the Remediation Monitoring requirements for sediment should be revised in include a variety of addition details is Unnecessary and Should Not be Adopted (TCAO Findings 34, 35; DTR §§ 34, 35)

As discussed above, the TCAO specifies that the Remediation Monitoring Plan will be prepared after adoption of the CAO. The Remediation Monitoring Plan will include numerous additional details on the sediment monitoring program that will be reviewed for technical adequacy by the Regional Board. Therefore, MacDonald's recommendation that they be provided in the TCAO is unnecessary.

**Comment ID:** 253

**Organization:** BAE Systems

**DTR Section:** 34, 35

**Comment:**

X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

4. Recommendation H.5 that the Remediation Monitoring should be revised to include decision rules for evaluating the dredging results is

Unnecessary and Should Not be Adopted (TCAO Findings 34, 35; DTR §§ 34, 35)

The decision rules for evaluating the dredging results will be proposed in the Remedial Monitoring Plan and reviewed for technical adequacy by the Regional Board. Therefore, MacDonald's recommendation that they be provided in the TCAO is unnecessary.

**Comment ID:** 254

**Organization:** BAE Systems

**DTR Section:** 34, 35

**Comment:**

X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 11, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

5. Recommendation H.6 that the Post Remediation Monitoring requirements should be revised as described in Section F of the MacDonald expert report is Unwarranted and Should Not be Adopted (TCAO Findings 34, 35; DTR §§ 34, 35).

As discussed above in the responses to MacDonald's detailed comments and conclusions for Section F of his expert report, his suggested changes to the Post Remediation Monitoring requirements are unwarranted.

**Comment ID:** 255

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

X. RESPONSES TO THE RECOMMENDATIONS IN SECTION H OF THE MARCH 1, 2011 MACDONALD EXPERT REPORT FOR THE SAN DIEGO SITE (TCAO § D.4)

6. Recommendation H.7 that the Trigger Exceedance Investigation and characterization process should be revised as described in Section G of the MacDonald expert report is Unwarranted and Should Not be Adopted (TCAO § D.4)

As discussed above in the responses to MacDonald's detailed comments and conclusions for Section G of his expert report, his suggested changes to the Trigger Exceedance Investigation and Characterization process are unwarranted.

**Comment ID:** 257

**Organization:** NASSCO

**DTR Section:** 14,18,19.1, Appen 18,19

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

The TCAO concludes that aquatic life beneficial uses (Estuarine Habitat (EST), Marine Habitat (MAR), and Migration of Aquatic Organisms (MIGR))) in San Diego Bay are impaired “due to the elevated levels of pollutants present in the marine sediment at the Shipyard Sediment Site.” TCAO, at ¶ 14. However, the results of the sediment investigation indicate that, although contaminants of concern and other pollutants are present in Site sediments in elevated concentrations relative to reference, they do not pose risks to aquatic life because they are not bioavailable, and because many constituents do not bioaccumulate. [Comment No. 33, TCAO, at 14, 18, 19 DTR, at 14, 18, 19.1, Appendix 18, Appendix 19].

Risks to aquatic life at the shipyard were evaluated by sampling and assessing both benthic macroinvertebrates and fish. Ginn Report, at 12. Effects on benthic macroinvertebrates were assessed using a triad approach, involving the synoptic collection of data on sediment chemistry, toxicity, and benthic community structure, and effects on fish were assessed by comparing fish living at the Site to fish caught in reference areas in San Diego Bay. *Id.* The results of these site-specific analyses showed little or no effects on aquatic life; in particular, the results confirmed that (1) sediment toxicity is absent from all but one station, with only one station showing any significant difference from reference conditions, and even then only by only a few percent; (2) measurements of four indices of benthic macroinvertebrate communities are not different from reference conditions; (3) fish show no elevation in significant liver lesions or other abnormalities related to chemical exposures at the site; and (4) predicted exposures of aquatic-dependent wildlife fall below the thresholds for which adverse effects are expected. *Id.* at 15-16. [Comment No. 34, TCAO, at 15-19, DTR, at 15-19, Appendix 15, Appendix 18].

Yet, through a series of overly-conservative (and unjustified) assumptions, Staff has erroneously concluded that aquatic beneficial uses are impaired, and that active remediation of Site sediments is needed. However, as discussed below, when analyzed using scientifically defensible methods, the data actually supports the conclusion that Site sediments pose no significant risk to aquatic life at NASSCO. Ginn Report, at 56 (concluding that all stations at NASSCO except for NA22, would be characterized as either unimpacted or likely unimpacted when analyzed using established, conventional assessment criteria). [Comment No. 35, TCAO, at 15, DTR, at 18.1].

**Comment ID:** 258

**Organization:** NASSCO

**DTR Section:** 18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not  
Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

a. Shipyard Chemicals And Other Pollutants Are Present In The Sediment, But Do Not Pose  
Risks To Aquatic Life (Findings 15 - 19)

The results of the sediment investigation indicate that, although contaminants of concern and other pollutants are present in Site sediments in elevated concentrations relative to reference, they do not pose risks to aquatic life because they are not bioavailable, and because many constituents do not bioaccumulate. [Comment No. 36, TCAO, at 19, DTR, at 19.1]. However, because the Staff's weight of the evidence decision framework emphasizes sediment chemistry, the DTR is skewed towards finding effects, even where the data supports the opposite conclusion. [Comment No. 37, TCAO, at 15, 16, 18 DTR, at 15, 16, 18, Appendix 15, Appendix 18]. Although the use of a weight of the evidence assessment based upon multiple lines of evidence (MLOE) is a generally accepted approach to evaluating sediment quality, the particular weight of the evidence framework described in the DTR does not follow accepted standards of practice for sediment assessments, resulting in a consistent bias in favor of finding impairment. Ginn Report, 13. [Comment No. 38, TCAO, at 15, DTR, at 15.1-15.4]. Because any weight of the evidence analysis necessarily requires the use of "best professional judgment," accuracy is dependent upon the expertise of the personnel interpreting the data, and may be flawed if based on unreasonable assumptions, or manipulation of the individual lines of evidence ("LOE") used in the analysis. Id. at 14. For the reasons discussed below, the DTR analysis is overly-conservative, fails to accurately portray Site conditions, and results in arbitrary cleanup levels with no risk-basis:

**Comment ID:** 260

**Organization:** NASSCO

**DTR Section:** 16,18,19

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not  
Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

a. Shipyard Chemicals And Other Pollutants Are Present In The Sediment, But Do Not Pose  
Risks To Aquatic Life (Findings 15 - 19)

(2) Shipyard Contaminants Are Present, But Not Bioavailable (Findings 16, 18, 19)

Another key flaw in Staff's weight of the evidence approach is the absence of an evaluation of the chemical bioavailability information in Staff's decision framework, which the EPA has recognized as "critical" to the success of weight of the evidence assessments. Ginn Report, at 15. Rather than using causal criteria to determine whether site contaminants are bioavailable, the DTR improperly equates high concentrations of chemicals with possible impacts to aquatic life. DTR, at Table, 18-1. Specifically, the DTR simply assumes that site chemicals are bioavailable, and causing adverse impacts to aquatic life, when chemistry exceeds empirical Sediment Quality Guidelines ("SQGs"), or when any statistically significant difference from reference is observed in toxicity tests. DTR, at 16-1, 18-3. Staff's failure to consider the bioavailability of chemicals at the Site is both "unscientific" and inconsistent with current standards of practice for sediment assessments. *Id.* [Comment No. 65, TCAO, at 16, 18, 19 DTR, at 16.1, 18.3, 19]. It is also particularly concerning considering that bioavailability analyses and site-specific toxicity and benthic community analyses support the conclusion that Site chemicals are not bioavailable and therefore do not impact beneficial uses at the Site—even where such chemicals are present in elevated concentrations relative to reference. Ginn Report, 18-19; Importance of Bioavailability for Risk Assessment of Sediment Contaminants at the NASSCO Site, Expert Report Prepared by Herbert E. Allen, Ph.D. (March 11, 2011) ("Allen Report"), at 9. [Comment No. 66, TCAO, at 18, 19, DTR, at 18.1, 18.3, 18.5, 19].

Bioavailability is a measure of the potential for a chemical to enter into ecological or human receptors; accordingly, the operative risk-measure for benthic invertebrates is not the total concentration of chemicals in sediments, but rather, the portion of such chemicals that are biologically available. Allen Report, at 2. Thus, the form of a chemical substance often dictates whether or not there will be any aquatic impairment. For example, a fish may be unaffected by the addition of a copper wire to its tank, whereas the addition of copper sulfate may be lethal. See, *Alo Depo*, at 225:13 – 226:16; *Barker Depo*, at 91:16 – 92:9.

It is thus well-known that chemical concentrations alone do not necessarily predict biological effects, and that conflicting triad data may signal that contaminants are not bioavailable—particularly where sampling indicates that contamination is present, but toxicity or benthic biological results are not significantly different from reference. Ginn Report, at 47, Allen Report, at 9. [Comment No. 67, TCAO, at 19, DTR, at 19.1]. Further, even where chemicals are bioavailable "bioavailability does not necessarily indicate the presence of adverse effects." DTR, at 19-1. [Comment No. 68, TCAO, at 19, DTR, at 19.1].

The DTR recognizes that causal criteria are preferred in the assessment of sediments, but concludes that contaminants in the sediment are bioavailable using empirical Sediment Quality Guidelines, without applying causal criteria that consider bioavailability. Allen Report, at 7. Using empirical SQGs based on total sediment pollution concentrations as screening levels, rather than causal SQGs, can lead to inaccurate risk predictions because empirical SQGs often mischaracterize sediments as toxic when they are not, and vice versa, and are not predictive of toxicity. Allen Report, at 7-8. [Comment No. 69, TCAO, at 18, DTR, at 18.2].

Given the results of the toxicity tests performed at the Site, it is clear that empirical SQGs have not accurately characterized Site sediments. As discussed in detail above, the toxicity and

benthic community tests indicate that only a small fraction of stations in the NASSCO leasehold do not meet the reference conditions, which suggests that even though contaminants may be present, they are not affecting biota at the Site. [Comment No. 70, TCAO, at 18-20, DTR, at 18-20]. Further, Staff has agreed that the shipyard data support the conclusion that contaminants at the Site are not bioavailable:

Q: Okay. So looking at the toxicity test results for the NASSCO stations, would you agree that these results suggest that contaminants in the sediment are not bioavailable?

A: Let's see. For the amphipod survival and urchin fertilization, I would agree with that, yes, that – that the – yeah, the toxicity results are not indicating bioavailability.

\* \* \* \* \*

Q: This summarizes the benthic community results for the Shipyard Sediment Site; correct?

A: Okay, yes.

Q: Looking at the benthic community results for the NASSCO stations in this table, do these suggest that contaminants in sediment are not bioavailable?

A: Yes.

\* \* \* \* \*

Q: Wouldn't you agree that the bioavailability of metals in the sediment at NASSCO is less than thresholds such as the ERLs and ERMs?

A: So the – the scenario is at the NASSCO site where the metals are higher than the ERLs and ERMs, you are – you are asking if the site-specific information indicates that that is not bioavailable to the – in the same degree as what the ERM and ERM – yes, I would.

Q: That's correct?

A: Yes.

Barker Depo, at 104:22 – 105:5; 105:15 – 105:22; 111:18 – 112:17. [Comment No. 71, TCAO, at 18, 19, DTR, at 18.3, 19]. Staff also neglected to consider that the potential for toxicity of metals in sediments depends on the degree to which they bind with other constituents in sediment, primarily sulfide and natural organic matter. Allen Report, at 10. [Comment No. 72, TCAO, at 18, 19 DTR, at 18.3, 19]. When these factors are considered, it becomes clear that binding of the metals cadmium, copper, lead, mercury, nickel, and zinc in the sediments at NASSCO is sufficiently strong to render sediments nontoxic to benthic organisms, consistent with the observed toxicity and benthic community results. Allen Report, at 23. [Comment No. 73, TCAO, at 18, 19, DTR, at 18.3, 19].

Staff's failure to consider bioavailability in the DTR is arbitrary and capricious, especially in light of the fact that toxicity and benthic community test results do not show significant impacts to aquatic life. Without an appropriate bioavailability analysis, Staff's assumption that contaminants are bioavailable based on empirical SQGs, and the corresponding conclusion that aquatic life at the Site is therefore impaired, are unjustified—particularly in light of Staff's recognition that direct evidence, including toxicity and benthic community data, suggest that contaminants are, in fact, not bioavailable. [Comment No. 74, TCAO, at 15-18, DTR, at 15.3, 16.1, 17, 18].

**Comment ID:** 261  
**DTR Section:** 14-20

**Organization:** NASSCO

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

a. Shipyard Chemicals And Other Pollutants Are Present In The Sediment, But Do Not Pose Risks To Aquatic Life (Findings 15 - 19)

(3) Some Shipyard Contaminants Do Not Bioaccumulate (Findings 15-19)

The DTR cites the finding that “bioaccumulation is occurring at the shipyard” as one basis for concluding that aquatic life at the site is impacted. DTR, at 14-1, 19-1. However, the DTR’s conclusion that Site sediments impact aquatic life is overly-conservative, since substances may bioaccumulate in laboratory tests, but not adversely affect the benthic community and because not all shipyard chemicals were found to bioaccumulate. Barker Depo, at 98:19 - 98:22; DTR, at 19-1. [Comment No. 75, TCAO, at 15-19, DTR, at 15.1- 15.3, 16-19].

Narrative water quality objectives applicable to the Site require that “all waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.” DTR, at 1-13 (citing the Water Quality Control Plan for the San Diego Basin, September 8, 1994). However, Staff’s Macoma tissue bioaccumulation testing indicates only that chemicals are present in the exposed Macoma; it does not assess whether the presence of such chemicals are at levels sufficient to cause toxicity or detrimental physiological responses, in violation of the water quality objective. Allen Report, at 20. Requiring cleanup based on the bioaccumulation potential of constituents, without conducting an appropriate risk-assessment to determine whether the observed bioaccumulation poses risks to consumer organisms, is both overly-conservative and unjustified. Id. [Comment No. 76, TCAO, at 15-20, DTR, at 15.1- 15.3, 16-20].

Moreover, many chemicals of concern at the Site are not statistically related to biological effects, and some chemicals do not bioaccumulate in aquatic life. See DTR, at Table 20-1. For example, for many contaminants of concern—including all primary contaminants of concern—the bioaccumulation test was the only test showing any statistical relationship between the chemical at the Site and a biological response to that chemical. This suggests that the concentrations observed in the Macoma laboratory testing did not accurately predict adverse responses in consumer organisms at the Site. Barker Depo, at 95:22 – 98:16. [Comment No. 77, TCAO, at 18-20, DTR, at 18.1, 18.5, 19, 20, Appendix 19]. Moreover, other constituents, including cadmium, chromium, nickel, selenium, silver, and PPT showed no statistical relationship with biological effects and also did not bioaccumulate in laboratory tests. DTR, at Table 20-1.

[Comment No. 78, TCAO, at 18-20, DTR, at 18.1, 18.5, 19, 20, Appendix 19]. Similarly, bioaccumulation relationships for arsenic and zinc, although statistically significant, were each controlled by only a single data point. DTR, at 19-1. [Comment No. 79, TCAO, at 18-20, DTR, at 18.1, 18.5, 19, 20, Appendix 19].

Considering the possibility that a substance could bioaccumulate in a laboratory test, yet not be associated with actual adverse effects to the benthic community, these results (together with direct evidence showing a mature and thriving benthic community at the Site), suggest Staff's conclusions concerning benthic harms are overstated. [Comment No. 80, TCAO, at 18-20, DTR, at 18-20].

**Comment ID:** 262

**Organization:** NASSCO

**DTR Section:** 17, 18.1, 18.3, 18.5

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

The DTR is overly-conservative because it concludes that there are impacts on aquatic life, even though the preponderance of sediment toxicity results show that Site sediments are nontoxic. Ginn Report, at 26; DTR, at 14-1, Table 18-8. [Comment No. 81, TCAO, at 18, DTR, at 18.1, 18.3, 18.5]. In fact, sediment toxicity at NASSCO is not only objectively low, but also lower than most other locations in San Diego Bay (as well as most other bays and estuaries nationwide). [Comment No. 82, TCAO, at 17-18, DTR, at 17, 18.3, Appendix 18]. Of 42 total toxicity tests conducted (excluding NA22), 37 tests showed conditions at NASSCO were as protective as background, with respect to toxicity. Alo Depo, at 269:2 – 270:21. In particular, (1) amphipod toxicity was found at only 1 of 15 stations at NASSCO, at which survival, at 70%, was only 3% below the statistical reference range and was equal to one of the reference stations; (2) toxicity to sea urchins was not found at any of the 15 stations at NASSCO; and (3) toxicity to bivalves was found at only 5 of 15 stations at NASSCO. Accordingly, the data are clear that sediments at NASSCO have “low” toxicity, if any. DTR, at Tables 18-8, 18-9; see also Ginn Report, at 26. [Comment No. 83, TCAO, at 18, DTR, at 18.1, 18.3, Appendix 18]. However, under Staff's biased weight of the evidence framework, nine NASSCO stations are characterized as having “low” toxicity, despite data showing no statistical differences from reference conditions under any of the three toxicity tests. DTR at Tables 18-9; Alo Depo, at 272:3 – 272:20. This is misleading, and Staff's framework should be revised to include a “no” or “nontoxic” category for toxicity results in order to accurately characterize stations that are not different from reference—as the State Board recognized when developing the State of California

Part 1 Sediment Quality Objectives (which include both “nontoxic” and “low” toxicity categories). [Comment No. 84, TCAO, at 15, 18, DTR, at 15.3, 15.4, 18.1, 18.3, 18.5, Appendix 18].

**Comment ID:** 263

**Organization:** NASSCO

**DTR Section:** 17-17,18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

(1) The Amphipod Survival Test Indicates That Shipyard Sediments Do Not Pose A Risk To Aquatic Life (Findings 14-18)

The amphipod survival test, which is the most reliable and widely-used of the three toxicity tests conducted, indicates that Site sediments do not pose risks to aquatic life. Ginn Report, at 26; DTR, at Table 18-8. Amphipod toxicity was found at only 1 of 15 stations measured at NASSCO (NA11). DTR, at Table 18-8. At that station, amphipod survival, at 70%, was only 3% below the statistical reference range of 73% and only 1% lower than the lowest reference station—representing a very small variance from reference conditions. *Id.*; Alo Depo, at 245:22 – 246:19, 247:3 – 247:6. [Comment No. 85, TCAO, at 18, DTR, at 18.3, Appendix 18]. Further, measured solely by the other toxicity and benthic community tests conducted (i.e., BRI, abundance, taxa, Shannon-Weiner diversity, sea urchin fertilization, and bivalve larvae development), NA11 was not impaired compared to reference conditions. Alo Depo, at 248:5 – 250:23. [Comment No. 86, TCAO, at 18, DTR, at 18.3, 18.4, Appendix 18]. Accordingly, it is overly conservative to conclude that NA 11 is “moderately” toxic based solely upon the amphipod survival result described above, when six of the seven direct lines of evidence show that NA11 is equivalent to reference, and the single line of evidence not meeting the reference condition differs by only a few percentage points. See *Id.* [Comment No. 87, TCAO, at 18, DTR, at 18.3, 18.4, Appendix 18]. Taken together, the favorable amphipod survival test data support the conclusion that Site sediments pose no risks to aquatic life. [Comment No. 88, TCAO, at 14-18, DTR, at 14-17, 18.1, 18.3-18.5, Appendix 18].

**Comment ID:** 264

**Organization:** NASSCO

**DTR Section:** 14-18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not  
Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As  
Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

(2) The Echinoderm Fertilization Test Indicates That Shipyard Sediments Do Not Pose A Risk  
To Aquatic Life (Findings 14-18)

The echinoderm fertilization test indicates that Site sediments do not pose risks to aquatic life, because the results showed that there were no statistically significant differences between background reference conditions and Site sediment with respect to sea urchin fertilization. DTR, at Table 18-8; Alo Depo, 252:13 – 253:2. [Comment No. 89, TCAO, at 18, DTR, at 18.3, Appendix 18]. Further, the lowest fertilization rate measured at NASSCO was 72%, which far exceeds the reference 95% lower prediction limit of 41.9%. Ginn Report, at 26. [Comment No. 90, TCAO, at 18, DTR, at 18.3, Appendix 18]. Accordingly, Site sediments pose no risk to echinoderm fertilization, and the favorable results of the echinoderm fertilization test support the conclusion that Site sediments do not pose risks to aquatic life. [Comment No. 91, TCAO, at 14-18, DTR, at 14-17, 18.1, 18.3, 18.5, Appendix 18].

**Comment ID:** 265

**Organization:** NASSCO

**DTR Section:** 14-18

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not  
Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As  
Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

(3) The Bi-Valve Larvae Test Indicates That Shipyard Sediments Do Not Pose A Risk To  
Aquatic Life (Findings 14-18)

The bivalve larvae test indicates that Site sediments do not pose risks to aquatic life, because the results showed that 10 of 15 stations had high percentages of normal larvae that exceeded the reference range. Ginn Report, at 26; DTR, at Table 18-8. [Comment No. 92, TCAO, at 18,

DTR, at 18.3, Appendix]. Although the remaining 5 stations were below reference, the two other toxicity tests showed that amphipod survival and sea urchin fertilization were not significantly different from reference for those stations. DTR, at Table 18-8. [Comment No. 93, TCAO, at 18, DTR, at 18.3, Appendix 18]. These latter indicators should be given more weight because of the experimental nature and variable results of the bi-valve larvae tests, both within replicates at the Site stations and at reference stations. Exponent Report, at Table 6-3; Ginn Report, at 24-26. For example, observed normality in replicate tests on sediment collected at NA01 varied from 6% to 80%, and normality in replicate tests on sediment from reference station 2243 varied from 8% to 79%. Id. Overall, 10 of the 30 triad stations tested exhibited variability between replicates of an order of magnitude, or greater, casting doubts on the reliability of this test as an accurate measure of toxicity. Id. [Comment No. 94, TCAO, at 15, 17, 18, DTR, at 15.1, 17, 18.3, Appendix 18].

Overall, since the majority of stations exhibited rates of normal bi-valve larvae development equal to or better than reference ranges, and the remaining five stations showed no toxicity according to other, more reliable measures, the bi-valve larvae test results support the conclusion that Site sediments do not pose risks to aquatic life. [Comment No. 95, TCAO, at 14-18, DTR, at 14-17, 18.1, 18.3, 18.5, Appendix 18].

**Comment ID:** 266

**Organization:** NASSCO

**DTR Section:** 15, 20

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

(4) Surveys Of Lesions In Fish Show A Greater Prevalence Of Lesions In Fish Caught In Reference Areas Than In Fish Caught At NASSCO (Findings 15, 20)

In addition to sediment chemistry, toxicity, and benthic community composition, the Exponent Report also compared observed contaminant-related lesions in fish caught at five different areas within San Diego Bay (reference stations, Inside NASSCO, Outside NASSCO, Inside BAE Systems, and Outside BAE Systems), and found that shipyard fish are “healthy, with no elevation in significant liver lesions or other abnormalities related to chemical exposures at the site.” Ginn Report, at 15. See also DTR, App. 15, at 15 (discussing the results of the fish histopathology analysis). [Comment No. 96, TCAO, at 15, DTR, at 15.3, Appendix 15]. In particular, the fish histopathology results revealed that:



- Of 70 kinds of lesions evaluated, only three were significantly elevated at one or more shipyard locations relative to reference conditions. Exponent Report, at 8-42.
- Where lesions were found in shipyard fish, the severity of the lesions found in most individuals were considered mild. Shipyard fish did not display any of the serious liver lesions typically found at heavily contaminated sites in the United States. Id., at 8-48.
- “A greater number of lesions (i.e., 6) were significantly elevated in the reference area compared to the shipyard sites, documenting that pathological conditions occur in parts of San Diego Bay away from the shipyards.” Id.
- Growth and condition of fish were not affected by proximity to the shipyards, or the presence of the two most abundant liver lesions. Id

Because no adverse effects to fish can be associated with specific chemical concentrations in the sediment, it would be inappropriate to derive specific chemical-based cleanup levels from the fish histopathology data in the DTR. Exponent Report, at 9-22. The DTR therefore correctly concludes that “the fish histopathology data does not indicate that the fish lesions observed in the data set can be conclusively attributed to contaminant exposure at the Shipyard Sediment Site.” DTR, at Appendix 15; see also Alo Depo, at 296:18 – 296:22 (testifying that the fish histopathology data was not considered in reaching conclusions on aquatic life impairment). [Comment No. 97, TCAO, at 15, 20, DTR, at 15, 20, Appendix 15].

Overall, however, the results of the fish histopathology analysis do suggest that spotted sand bass are not adversely affected by chemicals present in the sediments, water, or prey at NASSCO. Ginn Report, at 41-42. [Comment No. 98, TCAO, at 15, DTR, at 15.3, Appendix 15]. For example, as indicated above, the growth and condition of spotted sand bass near the shipyards were comparable to fish in reference areas. Id. [Comment No. 99, TCAO, at 15, DTR, at 15.3, Appendix 15]. The survey also revealed a greater prevalence of lesions in fish caught in reference areas than in fish caught at the shipyards (i.e., the total number of lesions that were significantly elevated was greater in fish caught at the reference sites than caught at the shipyards). Exponent Report, at 9-22. [Comment No. 100, TCAO, at 15, DTR, at 15.3, Appendix 15]. Of the 70 lesions evaluated the incidence of only four were considered as being significantly elevated near the shipyards, whereas the incidence of six were significantly elevated at reference areas, when compared with one or more shipyard sites. Id. [Comment No. 101, TCAO, at 15, DTR, at 15.3, Appendix 15]. Additionally, most of the lesions found in shipyard fish were “mild,” and the pathologist observed no serious liver lesions of the types commonly associated with contaminated sites. Id. [Comment No. 102, TCAO, at 15, DTR, at 15.3, Appendix 15]. Taken together, these results indicate that sediments at the shipyard do not pose risks to aquatic life. [Comment No. 103, TCAO, at 14, 15, 20, DTR, at 14, 15, 20, Appendix 15].

**Comment ID:** 267  
**DTR Section:** 14,15,20  
**Comment:**

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**Organization:** NASSCO

IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

b. Sediment Toxicity Is Very Low And Lower Than Most Other Locations In San Diego Bay (As Well As Most Other Bays And Estuaries Throughout The Country) (Findings 14-18)

(5) The CUT's Analysis Of PAHs In Fish Bile Does Not Support The Conclusion That Shipyard Sediments Adversely Impact Aquatic life (Findings 14, 15, 20)

The DTR correctly concludes that “the [fluorescent aromatic compound] concentrations observed in the fish collected cannot be conclusively attributed to contaminant exposure at the Shipyard Sediment Site.” DTR, at A15-14. In fact, fish bile analyses conducted at the Site suggest that fish at the shipyards are no more greatly exposed to PAHs than fish at other locations in San Diego Bay. Exponent Report, at 8-49. [Comment No. 104, TCAO, at 15, DTR, at 15.3, Appendix 15]. No statistically significant differences in PAH breakdown products were found at the shipyards relative to the reference location, and concentrations of bile breakdown products in fish from within the Site were generally less than concentrations in fish from outside the leaseholds. [Comment No. 105, TCAO, at 15, DTR, at 15.3, Appendix 15]. Taken together, these data support the conclusion that that Site sediments are not impairing aquatic life beneficial uses. Exponent Report, at xxxiii, 8-49. [Comment No. 106, TCAO, at 14, 15, 20, DTR, at 14, 15, 20, Appendix 15].

**Comment ID:** 268

**Organization:** NASSCO

**DTR Section:** 14-20

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

c. The Benthic Community Assessment Shows That Shipyard Sediments Are Not Causing Impacts To Aquatic Life (Findings 14- 20)

The benthic macroinvertebrate assessment—which is perhaps the most informative test since it measures the actual responses of organisms living in, or on, sediments at the Site—shows a mature and thriving benthic community at the Site, and provides direct evidence that Site sediments are not negatively impacting aquatic life. Ginn report, at 28; DTR, at Tables 18-8,

18-12. [Comment No. 107, TCAO, at 14-20, DTR, at 14-20, Appendix 18]. The benthic community assessment evaluated benthic communities at the site according to four metrics: BRI-E, abundance, taxa, and Shannon-Wiener diversity. DTR, at Table 18-12. Of these 60 individual comparisons, there were only three significant differences from reference pools—all of which occurred at stations NA20 (number of taxa) and NA22 (number of taxa and abundance). *Id.*, at 31. [Comment No. 108, TCAO, at 18, DTR, at 18.4]. When the benthic macroinvertebrate metrics are combined into an overall line of evidence, all of the NASSCO stations, except for NA20 and NA22, show no significant differences whatsoever from reference. DTR, at Table 18-13. [Comment No. 109, TCAO, at 18, DTR, at 18.4]. Yet, these remaining stations are categorized as having “low” effects—even though there are no significant differences from reference under any of the four benthic community metrics. *Id.* These stations are properly categorized as having “no” effects, since there are no significant differences from reference conditions; suggesting that there are “low” effects is misleading and inaccurate. Ginn Report, at 32. [Comment No. 110, TCAO, at 18, DTR, at 18.4].

Additionally, NA20 is erroneously designated as having “moderate” benthic effects, on the grounds that one of the four benthic community metrics (number of taxa) showed statistically significant differences from reference. *Id.*, at 32-33; DTR, at Table 18-12. However, the number of benthic taxa observed at NA 20 was 22, which is equal to the 95% LPL of the reference pool, and therefore should not be classified as statistically different. Ginn Report, at 32; DTR, at Table 18-12. [Comment No. 111, TCAO, at 18, DTR, at 18.4]. Additionally, NA20 is located in the vicinity of active piers; given that chemical concentrations at NA20 are generally much lower than in other areas, it is likely that any effects observed are the result of physical disturbances rather than contaminated sediments. Ginn Report, at 36. [Comment No. 112, TCAO, at 18, DTR, at 18.1, 18.2, 18.4]. Taking these results into consideration, the only station to show any statistically significant difference from reference benthic community conditions is NA22, which is located adjacent to the mouth of Chollas Creek and, as discussed below, is influenced by sources beyond the shipyard and physical disturbances. [Comment No. 113, TCAO, at 18, DTR, at 18.4].

In sum, and as detailed further below, nearly all of the benthic macroinvertebrate sampling stations at NASSCO show no adverse effects when compared with reference conditions based on the DTR assessment (and one of the two stations showing effects was inappropriately classified based on one metric). Ginn Report, at 40. [Comment No. 114, TCAO, at 18, DTR, at 18.4]. Multiple measures indicate that there are healthy benthic macroinvertebrate communities at the Site, with the possible exception of one station located adjacent to Chollas Creek. *Id.* [Comment No. 115, TCAO, at 18, DTR, at 18.4]. Accordingly, the direct assessment of benthic macroinvertebrate communities at NASSCO directly refutes the conclusion in the DTR that some areas at NASSCO have “likely” or “possible” effects on benthic macroinvertebrates as a result of shipyard discharges. [Comment No. 116, TCAO, at 14-18, 20, DTR, at 14-17, 18.1, 18.4, 18.5, 20].

**Comment ID:** 269  
**DTR Section:** 28.2.2.1  
**Comment:**

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**Organization:** NASSCO

IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff's Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

First, Staff assume that the Fractional Intake ("FI") of recreational and subsistence anglers that catch and eat fish and/or lobster from San Diego Bay would come entirely from fish and/or lobsters caught at the Shipyard Site. DTR, at 28-13 (Table 28-7), 28-17. This assumption is unrealistic on many levels. As noted above, Shipyard Site security measures absolutely bar public access. [Comment No. 178, TCAO, at 28, DTR, at 28.2.2, 28.2.5]. Moreover, the NASSCO Shipyard area is only 43 acres in size – there is no indication that this small area could support the angling demand of all of San Diego Bay's recreational and subsistence anglers every day for thirty years, even if it was publicly accessible for fishing and lobstering. [Comment No. 179, TCAO, at 28, DTR, at 28.2.2, 28.2.5].

**Comment ID:** 270

**Organization:** NASSCO

**DTR Section:** 28.2.6

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

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d. Staff's Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Second, Staff assume that four percent of arsenic is in the inorganic form. As described in the Ginn Report, this is a highly conservative assumption. Ginn Report, at 85-87. The Finley Report goes even further, pointing out that Staff chose this estimate without any justification, and noting that Staff did not collect or analyze fish tissue from the NASSCO Shipyard for inorganic arsenic. Finley Report, at 21. [Comment No. 180, TCAO, at 28, DTR, at 28]. The Ginn Report concludes that the "the DTR's conclusion that inorganic arsenic in seafood theoretically harvested at the NASSCO site 'poses a theoretical increased' cancer risk when compared to reference areas is not valid, and does not form the basis for concluding that beneficial uses are impaired or that any active remediation of sediments would be required to reduce arsenic exposure." Ginn Report, at 87. [Comment No. 181, TCAO, at 28, DTR, at 28, Appendix 28].

**Comment ID:** 271

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff's Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Third, Staff assume that subsistence anglers always consume the entire fish or shellfish, including the skin, guts, filter organs, etc., and not just the filet or edible portion. DTR, at 28-17. However, assuming that all subsistence anglers always consume the entire fish is excessively conservative, particularly when Staff has not shown that any subsistence anglers actually fish at or near the shipyard, or investigated how often such anglers, if any exist, would consume the entire fish. Finley Report, at 10-12. [Comment No. 182, TCAO, at 28, DTR, at 28.2]. With respect to lobsters, there is no evidence in the DTR that subsistence anglers could harvest enough lobsters from the shipyard to maintain a 30 year daily consumption rate of 161 g/day, or that all such lobsters would be eaten whole, including the shell, internal organs and meat. Id. [Comment No. 183, TCAO, at 28, DTR, at 28.2]. Regarding fish, while it is true that certain ethnic groups may use the whole body of harvested fish in soups or stews, members of such groups typically “gut” the fish to remove the liver and other soft organs prior to consumption. Ginn Report, at 89. [Comment No. 184, TCAO, at 28, DTR, at 28.2, 28.3]. In fact, the Santa Monica Bay seafood consumption study—which formed the basis for the consumption rates used in the DTR—found that only one percent of surveyed anglers consumed whole fish that had not been gutted. Id. [Comment No. 185, TCAO, at 28, DTR, at 28.2, 28.3]. Thus, rather than blindly assuming that all anglers always consume un-gutted whole body fish, it would have been more reasonable to assume that a certain proportion of harvested seafood is consumed in this manner based on site-specific data. [Comment No. 186, TCAO, at 28, DTR, at 28.2, 28.3]. Footnote: The distinction between consuming whole fish “gutted” or “not gutted” is important because the liver and other fatty internal organs in fishes typically contain much higher concentrations of PCBs than muscle tissue. Id. Thus, failing to account for the fact that many people will either fillet or gut fish prior to consuming them will result in an overestimation of risk.

**Comment ID:** 272

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff's Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Fourth, Staff assume that subsistence anglers only consume spotted sand bass or lobster, even though data from other species commonly available to anglers were available. For example, topsmelt (*atherinops affinis*) and jacksmelt (*atherinops californiensis*), both of which had much lower maximum concentrations of PCBs than spotted sand bass, typically comprise a significant proportion of the sport catch from shore and pier areas. Ginn Report, at 88. [Comment No. 187, TCAO, at 28, DTR, at 28, Appendix 28]. Accordingly, to avoid overestimating exposure, the dietary portion assumed to be comprised of un-gutted whole body fish should have been apportioned across species according to expected catch rates since (1) San Diego Bay anglers very likely will catch many species other than lobster or spotted sand bass, and (2) chemical concentrations vary widely amongst different fish species. *Id.*, at 88. [Comment No. 188, TCAO, at 28, DTR, at 28, Appendix 28]. Moreover, it is clear from San Diego Bay-specific fishing reference materials that fish are not equally distributed throughout the Bay, but rather, fish are "attracted to certain habitats based on prey availability, physical structures, and hydrodynamic conditions." *Id.*, at 92. [Comment No. 189, TCAO, at 28, DTR, at 28, Appendix 28].

**Comment ID:** 273

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff's Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Fifth, Staff assumes that maximum measured chemical concentrations are representative of typical exposure for recreational and subsistence fishers, despite the fact that multiple samples were collected at each sampling station. DTR, at 28-17. This simplistic approach "gives no insight as to the potential variability in the risk estimates as a function of the range and frequency

of measured contaminant levels. In essence, each of the risk estimates presented by the RWQCB relies on a single measured (in this case, maximum) value, which can yield a highly biased risk estimate, particularly if the underlying data set is skewed.” Finley Report, at 14. [Comment No. 190, TCAO, at 28, DTR, at 28, Appendix 28]. In support of its approach, the DTR cites a 1989 EPA guidance document, however, the Finley Report cites to recent 2005 EPA risk assessment guidance, which states that, “significant risk management decisions will often benefit from a more comprehensive assessment...such assessments should provide central estimates of potential risks in conjunction with lower and upper bounds (e.g., confidence limits) and a clear statement of the uncertainty associated with these estimates” (USEPA 2005); p. 1-9 – 1-10). [emphasis added].” Id. [Comment No. 191, TCAO, at 28, DTR, at 28, Appendix 28]. At the very least, the DTR should have included risk estimates based on measures of central tendency, such as means or averages, and/or distributions of the underlying measured concentrations, as opposed to single-point measurements. [Comment No. 192, TCAO, at 28, DTR, at 28, Appendix 28].

**Comment ID:** 274

**Organization:** NASSCO

**DTR Section:** 28.2.2.1

**Comment:**

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#### IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

4. There is No Significant Risk To Human Health (Findings 25-28)

d. Staff’s Reliance on High-End, Implausible Exposure Scenarios For The Tier II Risk Assessment Does Not Provide A Scientifically Valid Estimate of Risk (Finding 28)

Sixth, Staff’s risk assessment presumes that anglers have free and complete access to the shipyard, even though access to the shipyard is currently highly restricted, and is expected to remain so for the foreseeable future. See Section IV.A.4.a, above. [Comment No. 193, TCAO, at 28, DTR, at 28.2.2]. In light of the strict security regulations at NASSCO, described in Section IV.A.4.a, above, it is patently unreasonable to assume that anglers could access the shipyard, let alone fish every day for 30 years and subsist solely fish and shellfish caught at the leasehold. Id. [Comment No. 194, TCAO, at 28, DTR, at 28.2.2]. In addition, according to a recent fishing guide, the closest fishing area to the NASSCO Shipyard is approximately 0.7 miles away, with no marked fishing areas or important fishing habitats anywhere near the NASSCO Shipyard. Ginn Report, at 92-94, Figure 7. [Comment No. 195, TCAO, at 28, DTR, at 28.2.2]. Based on these practical fishing realities, it is “inconceivable that an angler would fish 100 percent of the time for 30 years and obtain all seafood at the NASSCO shipyard site.” Id. at 94. [Comment No. 196, TCAO, at 28, DTR, at 28.2.2, 28.2.6].

Likewise, it is inappropriate, and contrary to EPA guidance, to assume that unmodified fish consumption rates from a highly accessible recreational area, such as Santa Monica Bay, are representative of fish consumption rates from a secure, industrial facility, such as NASSCO.

[Comment No. 197, TCAO, at 28, DTR, at 28.2.2, 28.2.6]. “The Santa Monica Bay study assessed anglers in an area where fishing is freely allowed via party or private boats, numerous piers and/or jetties, and the beach. Given the severe access restrictions of the NASSCO shipyard from land (the shore or from piers/jetties) and water (anglers on boats), it is obvious that fish consumption rates in the NASSCO leasehold are not comparable to those in Santa Monica Bay.” Finley Report, at 17. [Comment No. 198, TCAO, at 28, DTR, at 28.2.2, 28.2.6].

**Comment ID:** 280

**Organization:** SDG&E

**DTR Section:** 32.5.2

**Comment:**

**1.3 Non-Triad Approach Fails to Address Causal Connection Between COCs and Benthic Risk and 60% is Arbitrary and Without Scientific Support**

The Non-Triad Data Approach used by CRWQCB (2010) to address benthic risk potential using sediment chemistry results is likewise critically flawed and cannot be used to quantify or understand the relative causal contribution of the five COCs to adverse toxic effects on macroinvertebrate communities (Conder, 2011a). The first part of the Non-Triad approach, a comparison of station chemistry results to 60% of the LAET values, is flawed because the use of the 60% value is arbitrary and is not supported by any technical or regulatory guidance. The DTR lacks any technical support or other scientific evidentiary record to validate the use of a 60% LAET. Additionally, the LAET does not establish causality between chemicals and adverse effects because it is developed using sediments containing an arbitrary mixture of chemicals. This deficiency equally applies to the second portion of the CRWQCB (2010) Non-Triad Data Approach, the SS-MEQ (Conder, 2011a). Neither the 60% LAET nor the SS-MEQ incorporates bioavailability considerations, such as normalization of concentrations of organic compounds in sediment by the amount of organic carbon (Conder, 2011a). The shortcoming regarding a lack of bioavailability in the CRWQCB (2010) benthic assessments was also noted by Allen (2011) in his analysis of chemical exposures to benthic invertebrates at the NASSCO portion of the Site. Allen (2011) arguments also apply to the BAE portion of the Site since a main criticism is that the CRWQCB (2010) primarily relied upon concentrations of total chemical in sediment (at both BAE and NASSCO) without regard to other conditions or factors that may influence bioavailability.

The Toxic Unit approach outlined in Conder (2011a) is a causal approach that is superior to an empirical evaluation in assessing benthic risk and should replace the CRWQCB (2010) sediment chemistry line of evidence used in the Triad, and should be used for understanding aquatic life risk potential where Triad data are unavailable, replacing the current Non-Triad Data Approach. The Toxic Unit approach explicitly evaluates causality between individual chemicals and Aquatic Life BUI in a manner that includes TBT, explicitly considers bioavailability of the five Site primary COCs and takes into account toxicity of individual COCs that are not addressed in the Triad or non-Triad approaches (Conder, 2011a). The Toxic Unit approach used in Conder (2011a) is similar to that used by Allen (2011) to evaluate the benthic risks associated with metals and PAHs at the NASSCO portion of the Site. However, Allen (2011) failed to incorporate a Toxic Unit analysis of PCBs or TBT despite the availability of exposure and effects data (Conder, 2011a). As such,



the Allen (2011) analysis remains incomplete with regards to the effects of PCBs and TBT at the NASSCO portion of the Site.

**Comment ID:** 281

**Organization:** SDG&E

**DTR Section:** 18 and 32

**Comment:**

**1.4 Revised Remedial Footprint Based Upon Causal Approach to Benthic Risk Evaluation**

For the existing Triad stations, a revised approach using the Toxic Unit in place of the current SQGQ1-based sediment chemistry line of evidence was used (Conder, 2011a). A sediment chemistry result of “Moderate/High” was assumed when any of the COCs exhibited a Toxic Unit greater than 1 and “Low” when all of the COCs exhibited Toxic Units less than or equal to 1 (Tables 1-19). The existing CRWQCB (2010) Triad framework (Table 18-14) was then used to interpret Triad results for each of the 30 Triad stations using these revised Toxic Unit-based sediment chemistry line of evidence results along with existing toxicity and benthic community lines of evidence. Results of the analysis (Table 19 for stations originally classified by CRWQCB (2010) as “Possible” or “Unlikely” and Table 19 of Conder (2011a) for stations originally classified by CRWQCB (2010) as “Likely”) indicate that the following Triad stations exhibit a Triad designation that includes “Likely”: NA11, NA19, SW04, SW13, and SW17.

For the Non-Triad stations, the Toxic Unit approach was used in place of the deficient SS-MEQ and 60% LAET evaluations. Benthic risk potential equivalent to a Triad result that includes “Likely” was assumed for stations in which any of the COCs exhibited a Toxic Unit greater than 1 (Tables 1-19). Non-Triad with this designation included: NA10, NA18, NA21, NA27, NA28, SW01, SW10, SW14, SW16, SW24, and SW34.

The results of the revised Likely and Non-Triad analyses (using the Toxic Unit approach) were used to revise the remedial footprint to address potential Aquatic Life BUI. Stations identified by the revised Toxic Unit-based Triad and Non-Triad Data approaches were assumed to represent polygons exhibiting Aquatic Life BUIs and should be considered for inclusion into the remedial footprint to address potential Aquatic Life BUI (Figure 1). This footprint should be fully evaluated on the basis of overall technical and economic feasibility in a manner consistent with the approaches discussed in CRWQCB (2010).

Alternate footprints to protect Aquatic Life BUIs have been proposed by others (MacDonald, 2009, 2011; Spadaro et al., 2011). The Toxic Unit approach used to derive the proposed footprint shown in Figure 1 is superior to the SQG-based evaluation used in part to identify polygons for remediation by MacDonald (2009, 2011) because the latter approach relies on empirical SQGs that suffer from the same weaknesses as the SQGQ1, SS-MEQ, and 60% LAET approaches (lack of chemical causality between concentrations and effects). The Toxic Unit approach is also a more scientifically-rigorous chemical line of evidence than the approach Spadaro et al. (2011) used to derive an alternate footprint to address Aquatic Life BUI in the BAE portion of the Site. Spadaro et al. (2011) relied heavily on a simple ranking of the total concentrations of COCs in sediment without regard to bioavailability or effects levels (Table 6 of Spadaro et al., 2011). This

level of simplicity is the least technically-defensible approach to understanding chemical effects on benthic invertebrates of any approach used at the Site to date.

**Comment ID:** 282  
**DTR Section:** 18.5

**Organization:** NASSCO

**Comment:**

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**IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE**

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

a. Shipyard Chemicals And Other Pollutants Are Present In The Sediment, But Do Not Pose Risks To Aquatic Life (Findings 15 - 19)

(1) The TCAO Overstates The Sediment Chemistry Prong Of The Triad Analysis (Findings 15-20)

The TCAO overstates the sediment chemistry prong of the triad analysis both because (1) differences in sediment grain size and total organic carbon between the reference pool and shipyard sediments, which are unrelated to shipyard discharges, skew the results in favor of finding higher sediment chemistry at NASSCO, and because (2) Staff's MLOE decision framework is driven primarily by sediment chemistry, even though most experts place greater weight on biological lines of evidence, particularly benthic community analysis. Ginn Report, at 14, 17-19. [Comment No. 39, TCAO, at 15-20, DTR, at 15-20, Appendix 15, Appendix 18, Appendix 19].

(b) The MLOE Analysis Places Undue Weight On Sediment Chemistry And Neglects Direct Biological Measures, Contrary To Generally Accepted Guidance (Findings 15, 16, 18, 20)

Additionally, the MLOE analysis supporting the TCAO is inconsistent with other published decision frameworks, and places undue emphasis on the sediment chemistry line of evidence in violation of sound scientific and technical principles. [Comment No. 51, TCAO, at 15, 16, 18, 20, DTR, at 15, 16, 18, 20]. Specifically, the TCAO and DTR framework is fundamentally flawed because it concludes that adverse effects on benthic macroinvertebrates are "likely" or "possible" whenever sediment chemistry is characterized as "high"—regardless of whether significant sediment toxicity or adverse effects on benthic invertebrates are also observed. DTR, at Table 18-4. [Comment No. 52, TCAO, at 18, DTR, at 18.2]. As a result, the chemistry line of evidence unilaterally trumps the others, causing the TCAO and DTR reach conclusions about conditions at the Site that are not technically justified. Ginn Report, at 48. Staff's framework is further biased by its lack of a "no" effects category – meaning that stations will be characterized as having at least "low" levels of effects, even where results are indistinguishable from reference

conditions – contrary to methods published by others, including the State Water Resources Control Board. Id. [Comment No. 53, TCAO, at 18, DTR, at 18.2].

The State and Regional Boards have consistently recognized that sediment is a “complex matrix that makes establishment of an objective” based on a single line of evidence “problematic.” See, e.g., Staff Report, Water Quality Control Plan for Enclosed Bays and Estuaries, Part 1, Sediment Quality (September 16, 2008) (“Phase 1 SQO Staff Report”), at 5-8. It is also well-understood that there are significant weaknesses and confounding factors that make sediment chemistry a poor diagnostic tool when used in isolation, and lead to the fundamental principle that impacts due to contaminants should not be inferred unless the weight of the evidence clearly supports such an inference. Ginn Report, at 13. [Comment No. 54, TCAO, at 15, 16, DTR, at 15, 16]. Staff, too, has correctly recognized that chemistry data alone is insufficient to predict biological impacts, and that it is preferable to rely on biological lines of evidence to assess biological impacts. DTR, at 15-1 (“[S]ediment chemistry provides unambiguous measurements of pollutant levels in marine sediment, but provides inadequate information to predict biological impact.”); Deposition of David Gibson (“Gibson Depo”), at 143:7 - 143:21 (“Q. Should this direct line of evidence of toxicity be given more weight than chemistry? A. As a biologist, I would say yes because the reaction of the organism itself is a better indicator of true risk than the chemistry alone; but they do have to both be considered together.”); Alo Depo, at 228:33 – 229:3 (agreeing that “the biologically based lines of evidence are the most important since they are direct measures of what is being protected.”). [Comment No. 55, TCAO, at 15, 16, DTR, at 15-16].

On its face, the direct measurements of biological conditions included in the DTR reveal that only a minimal fraction of the stations at NASSCO do not meet reference conditions. Ginn Report, at 49. Specifically, (1) benthic communities are equivalent to reference conditions at 14 of 15 stations in the NASSCO leasehold, with the only “moderately” impacted station located at the mouth of Chollas Creek; (2) amphipod toxicity was found at only 1 of 15 stations at NASSCO, at which survival, at 70%, was only 3% below the statistical reference range and was equal to one of the reference stations; (3) toxicity to sea urchins was not found at any of the 15 stations at NASSCO; and (4) toxicity to bivalves was found at only 5 of 15 stations at NASSCO. DTR, at Tables 18-8 and 18-13. [Comment No. 56, TCAO, at 18, DTR, at 18.3-18.4]. Note that the bivalve test used in the shipyard investigation, as required by Board Staff, was an experimental method and produced highly inconsistent results, even among replicates of individual samples and for reference samples. Accordingly, applying Staff’s own weight-of-the-evidence framework, the results of this test should carry less weight than the amphipod and sea urchin tests since there is a lower level of confidence associated with this particular test. Ginn Report, at 49-50; Alo Depo, at 255:18 – 255:25 (agreeing that the bivalve test is more susceptible to confounding factors and its association with ecological receptors is less certain than the amphipod survival test). [Comment No. 57, TCAO, at 18, DTR, at 18.3-18.4].

Despite these favorable toxicity results, the skewed weight-of-the-evidence scheme in the DTR determines that seven stations at NASSCO have either “possible” or “likely” impacts on benthic macroinvertebrates, based primarily upon the sediment chemistry results for those stations. DTR, at Tables 18-1 and 18-4. [Comment No. 58, TCAO, at 18, DTR, at 18.2]. Where chemical and biological indicators disagree, it is inappropriate to simply assume, without further

investigation, that effects on benthic macroinvertebrates are “possible” or “likely,” as was done in the TCAO and DTR. In so doing, Staff overemphasizes elevated sediment chemistry, resulting in a decision framework that is consistently biased in favor of finding impacts, even where toxicity and benthic effects are equivalent to reference conditions. Ginn Report, at 53 – 54. [Comment No. 59, TCAO, at 18, DTR, at 18.1-18.5].

Further, despite Staff’s acknowledgement that relying solely on chemical concentration data does not account for factors that affect bioavailability of contaminants in sediment, Staff inexplicably failed to further investigate stations that were designated as “likely” impaired due to “high” chemistry results (such as NA19 and NA22), or to sufficiently evaluate alternative causal explanations. [Comment No. 60, TCAO, at 18, DTR, at 18.1]. Accordingly, Staff’s approach directly contradicts current regulatory guidance (which recommends placing greater weight on biological lines of evidence when indicators diverge), resulting in the misclassification of NA17 and NA19 as “possibly” and “likely” impaired, respectively, despite little or no indication of toxicity or benthic community effects. Ginn Report, at 52-54, 56 (quoting U.S. EPA Sediment Classification Methods Compendium (U.S. EPA 1992)); see also Alo Depo, at 297:3 – 298:3, 298:22 – 299:7, 299:8 – 300:17. The issue is underscored clearly by examining station NA19, where Staff has categorized the station as “likely” impaired based solely upon high chemistry and the bi-valve larvae test, even though six of the seven lines of direct evidence indicate no significant differences from reference. Alo Depo, 263:22 – 265:17. [Comment No. 61, TCAO, at 18, DTR, at 18.1].

A scientifically defensible approach to integrating LOE results is essential to ensure a valid MLOE conclusion, particularly where chemical and biological indicators yield disparate results. Ginn Report, at 45-46. Unfortunately, the DTR includes little explanation of how Staff’s decision framework was derived, and fails to provide any citation from scientific literature supporting the framework used or the undue emphasis placed on sediment chemistry. Ginn Report, at 46. [Comment No. 62, TCAO, at 18, DTR, at 18.1-18.5]. Staff has also openly acknowledged that its recommended framework has never been published or peer-reviewed. Alo Depo, at 297:3 – 298:3. This is particularly concerning considering that Staff’s framework is significantly more conservative than existing, published frameworks—including the State of California Sediment Quality Objective (SQO) framework, in which triad data indicating “high” chemistry, “reference” benthic communities, and “nontoxic” or “low” sediment toxicity would result in a station being designated as “likely unimpacted” (as contrasted with “possibly” or “likely” impacted, under Staff’s framework). [Comment No. 63, TCAO, at 18, DTR, at 18.1-18.5]. Since Staff’s approach simultaneously contravenes accepted guidance and overstates the chemistry prong of the triad analysis relative to direct biological evidence, the resulting conclusions in the TCAO and DTR are not scientifically or technically valid, and do not support the proposed remediation. [Comment No. 64, TCAO, at 15, 16, 18, DTR, at 15, 16, 18.1, 18.2, 18.5].

**Comment ID:** 283

**Organization:** City of San Diego

**DTR Section:** 5

**Comment:**

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I.

STAR & CRESCENT BOAT COMPANY IS APPROPRIATELY NAMED AS A DISCHARGER BECAUSE IT IS THE LEGAL SUCCESSOR TO SAN DIEGO MARINE CONSTRUCTION COMPANY.

A.INTRODUCTION

Star & Crescent Boat Company (“Star & Crescent Boat”) claims that there is no evidence it is a legal successor to San Diego Marine Construction Company (“SDMCC”), one of the parties potentially responsible for contamination of the Shipyard Sediment Site as a result of its historical shipyard operations. Yet the very evidence submitted by Star & Crescent Boat with its comments to the Board demonstrates that it was a mere continuation of San Diego Marine Construction Company (“SDMCC”), if not a fraudulent transfer to hide or escape liabilities, such that Star & Crescent Boat is a corporate successor of SDMCC. A detailed review of the evidence Star & Crescent Boat submitted in fact demonstrates the strength of the successor liability case against Star & Crescent Boat and proves it is the proper successor and that Star & Crescent Boat is appropriately named as a Discharger to this proceeding.

The evidence demonstrates that a few years after SDMCC changed its name to Star & Crescent Investment Company (“Investment Company”), Investment Company, led by O.J. Hall, Jr., created Star & Crescent Boat (installing himself and his children as directors) so as to transfer its \$800,000 harbor business to it, for which it received grossly inadequate consideration. Following the transfer, Star & Crescent Boat, led by O.J. Hall, Jr.’s children, continued the harbor business while Investment Company retained control over Star & Crescent Boat, reviewing its operations, financials, and dictating and approving its directors salaries, bonuses and its stock dividends (actually marked “approved” by O.J. Hall, Jr. in Board of Directors meeting minutes). The evidence also shows there was officer and director overlap between the two companies, first with O.J. Hall, Jr. leading both companies, and later via Kenneth Beiriger as a director of both companies and via Investment Company—still led by O.J. Hall, Jr.—controlling Star & Crescent Boat. Also, O.J. Hall, Jr.’s three children--Judy Hall, Stephen Carlstrom and Janet Miles--were the directors and shareholders of Star & Crescent Boat.

The evidence also supports the conclusion that the creation of Star & Crescent Boat and transfer of assets and liabilities to it was fraudulent in nature, based on sham initial director appointments, unsupported stock valuations, and questionable stock swaps, which is another basis for successor liability.

B.STATEMENT OF RELEVANT FACTS AS TO STAR & CRESCENT BOAT COMPANY

SDMCC operated a shipyard in the northern part of the Shipyard Sediment Site from approximately 1915 to 1972. In 1972, SDMCC sold its shipyard assets to Campbell Industries. Immediately thereafter, in July 1972, SDMCC changed its name to Star & Crescent Investment Company (“Investment Company”) by consent of SDMCC’s directors/shareholders, O.J. Hall, Jr. and G.E. Hall. (S&C Boat Ex .10{"S&C Boat Ex. \_\_" shall refer to the exhibits submitted by Star & Crescent Boat with their Written Commnet Submission} ).

Star & Crescent Boat was incorporated on April 7, 1976. Six directors were appointed that same day: Carole Lechlietner, Monica Triplett, Kay Harpold, Gail Lary, Jacqueline Rhodes and Dorine Schamens. (S&C Boat Ex. 16). Just two days later, on April 9, 1976, each of the initial

directors of Star & Crescent Boat resigned simultaneously without explanation and six new directors were appointed: O.J. Hall, Jr., Judy Hall, Kenneth Beiriger, Stephen Carlstrom, Raleigh Miles, and Janet Miles. (S&C Boat Ex. 17). O.J. Hall, Jr. and Kenneth Beiriger were elected the President and Vice President-Treasurer, respectively, of Star & Crescent Boat on that same day, April 9, 1976. (Id.). O.J. Hall, Jr. was simultaneously a director of Investment Company when he was elected a director and President of Star & Crescent Boat Company. (S&C Boat Exs. 10, 11-14, 17). Kenneth Beiriger became an Investment Company director by at least 1977, if he was not already previously, and remained an Investment Company director simultaneously with his directorship at Star & Crescent Boat from at least 1977 to 1983. (S&C Boat Exs. 11-14, 17-18, City Ex. 1-2 {"City Ex. \_\_\_" shall refer to the exhibits/evidence attached hereto and submitted herewith by City of San Diego.}). Judy Hall, Janet Miles and Stephen Carlstrom are O.J. Hall, Jr.'s children. (City Ex. 3). Raleigh Miles appears to be the husband of Janet Miles and O.J. Hall's son-in-law.

Immediately after the replacement of the first group of "directors" by O.J. Hall, Jr. and others either related to Investment Company or his children {In addition to Kenneth Beiriger, discussed above, the remaining directors were the children of O.J. Hall, Jr.}, on April 9, 1976, Star & Crescent Boat, via its new O.J. Hall, Jr./family-led group of directors, voted to acquire the significant harbor business related assets--over \$800,000 worth--of Investment Company in exchange for 1,500 shares of newly created stock of the new Star & Crescent Boat. (S&C Boat Ex. 23) As Star & Crescent Boat had just been created two days earlier, these shares were basically created out of thin air. Even assuming a "value" could be ascribed to the newly created stock of Star & Crescent Boat at that time, the directors, on April 9, 1976, only placed its alleged "par value" at \$10 per share, making the 1,500 shares worth at most \$15,000. (Id.). Thus, Star & Crescent Boat "purchased" the \$800,000+ harbor business of Investment Company for at most \$15,000.

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At the same time it designated the par value of the newly created 1,500 shares to be \$10 per share, the Star & Crescent Boat O.J. Hall, Jr./family led-directors also designated the "fair market value" of the newly created shares to be over \$700,000, without any basis whatsoever, two days after the company was created out of thin air. (Id.). At the time of the valuation, the brand-new Star & Crescent Boat owned no capital, was not engaged in any business, and had no other identified assets. (Id.) No accounting statements were attached to the corporate minutes to indicate that an audit or any other accounting investigation supported the valuation. (Id.) The numbers were simply chosen by the directors, who conveniently were in charge of both sides of the transaction.

It is unclear where the \$15,000 came from for the initial consideration for the shares, given the relationship between Investment Company and Star & Crescent Boat at the time of this transaction and their co-leadership by O.J. Hall, Jr., as the head of the family enterprise, as well as their relationship thereafter. (S&C Boat Ex. 11-14, 17, 23; City Ex. 1-2). Due to the relationship, it likely came from O.J. Hall, Jr. and Investment Company, since he (and his family) controlled both companies. It is similarly unclear whether Star & Crescent Boat really assumed a claimed \$86,000 of liabilities of Investment Company as stated in the April 9, 1976 Board of Directors meeting minutes, given the relationship of the companies and the fact that Investment Company was still paying Star & Crescent Boat's directors' salaries and bonuses, and determining and approving its stock dividends, for at least several years following the

transaction, as also discussed in detail immediately below. (S&C Boat Ex. 11-14,17 and City Ex. 1-2).

Regardless, even if both the \$15,000 and \$86,000 are taken into account as consideration, Investment Company, led by O.J. Hall, Jr., still transferred its \$800,000+ harbor business to Star & Crescent Boat, also led by O.J. Hall, Jr. and his family, at its inception for, at most, pennies on the dollar, for Star & Crescent to continue that business. At the same time as the transaction was taking place, Star & Crescent Boat and Investment Company were both under O.J. Hall, Jr.'s direct control. (S&C Boat Ex. 10, 17).

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Six months after the creation of Star & Crescent Boat and the issuance of these 1,500 shares to Investment Company as the consideration for the purchase of the \$800,000 of assets of Investment Company, Investment Company gave the shares back to Star & Crescent Boat. (S&C Ex. 23). This is not entirely surprising given that this was clearly a family enterprise and the directors of Star & Crescent Boat O.J. Hall, Jr.'s children. Star & Crescent Boat and Investment Company remained under O.J. Hall, Jr.'s control when this gift of shares took place, as even after O.J. Hall, Jr. resigned as a director of Star & Crescent Boat, he retained control over Star & Crescent Boat via his presidency and directorship at Investment Company. (S&C Boat Ex. 11-14, City Ex. 1-2). After O.J. Hall, Jr. resigned his directorship from Star & Crescent Boat, his son, Stephen Carlstrom, became President and Mr. Carlstrom, Judy Hall, and Janet Miles—three of his four children—were the shareholders. (S&C Boat Ex. 17, City Ex. 3).

While Star & Crescent Boat made "payments" to Investment Company from its dividends for this stock over the next several years, during that same time, Investment Company was controlling and determining the amount of Star & Crescent Boat's dividend payments, as well as its directors' salaries and bonuses, and other operational and financial aspects of the business as well, as it operated under the umbrella of Investment Company as clearly part of the family enterprise:

- Investment Company and Star & Crescent Boat Company are discussed together in minutes of the Board of Directors meetings for Investment Company for years after Star & Crescent Boat's creation. Further, the minutes and proposals therein, including discussions and proposals regarding Star & Crescent Boat, were "Approved" by O.J. Hall, Jr. and K.N. Beringer, both Investment Company directors. (S&C Boat Ex. 11-14).

- Salaries and bonuses for Star & Crescent Boat directors in 1978 were dictated and approved by Investment Company and its directors O.J. Hall, Jr. and K.N. Beiriger. (S&C Boat Ex. 11-12).

- In 1979 and 1981, the minutes of Investment Company Board of Directors meetings state that Investment Company reviewed Star & Crescent Boat's operations and financials and that the salaries and bonuses, and dividends, of Star & Crescent Boat Company were determined and approved by O.J. Hall, Jr. and K.N. Beiriger, directors of Investment Company. (S&C Boat Ex. 13-14).

- In 1981, Investment Company guaranteed a \$300,000+ loan for Star & Crescent Boat. (S&C Boat Ex. 30).

Investment Company and Star & Crescent Boat Company are also discussed together in the minutes of Board of Directors meetings for Star & Crescent Boat Company in the years following Star & Crescent Boat's creation. (S&C Boat Ex. 30, City Ex. 1-2).

Minutes from Star & Crescent Boat Board of Directors meetings from 1980 discussed Investment Company employee pay checks and stated that Investment Company and O.J. Hall approved of Star & Crescent Boat director salaries. (City Ex. 1-2).

•In 1986, Star & Crescent Boat merged with San Diego Harbor Excursions. (S&C Boat Ex. 32).

### C. STAR & CRESCENT BOAT COMPANY HAS SUCCESSOR LIABILITY FOR SDMCC.

The general rule of successor liability under the laws of California is that the corporate purchaser of another corporation's assets presumptively does not assume the seller's liabilities, unless:

- (1) there is an express or implied agreement of assumption;
- (2) the transaction amounts to a consolidation or merger of the two corporations;
- (3) the purchasing corporation is a mere continuation of the seller; or
- (4) the transfer of assets to the purchaser is for the fraudulent purpose of escaping liability for the seller's debts.

*Ortiz v. South Bend Lathe* (1975) 46 Cal. App. 3d 842, 846, disapproved on other grounds in *Ray v. Alad Corp.* (1977) 19 Cal. 3d 22, 34; *Fisher v. Allis-Chalmers Corp. Prod. Liab. Trust* (2002) 95 Cal.App.4th 1182, 1188.

Here, as discussed further below, the evidence demonstrates that Star & Crescent Boat was a mere continuation of SDMCC/Investment Company, and also indicates that the creation of Star & Crescent Boat and Investment Company's transfer of assets to it was also of a fraudulent nature to escape or hide liabilities.

#### 1. Star & Crescent Boat Is A Mere Continuation of SDMCC/Investment Company.

With respect to the mere continuation exception, in discussing this exception to the general rule of successor non-liability, the California Supreme Court in *Ray v. Alad* stated that liability has been imposed on a successor corporation upon a showing of one or both of the following factual elements:

- 1) no adequate consideration was given for the predecessor corporation's assets and made available for meeting the claims of its unsecured creditors;
- 2) one or more persons were officers, directors, or stockholders of both corporations. *Ray v. Alad*, supra, 19 Cal. 3d at p. 29 (citing cases).

In this matter as to Star & Crescent Boat, both of these factors are met.

a. There Was Grossly Inadequate Consideration Paid for Investment Company's \$800,000 Harbor Assets.

On April 7, 1976, Star & Crescent Boat was created, with six "directors" who all, two days later, simultaneously resigned without explanation and were replaced by O.J. Hall, Jr., the president and director of Investment Company, along with five others, at least one of whom was also related to Investment Company (Kenneth Beiriger), with the remainder being O.J. Hall, Jr.'s children and one of their spouses. (S&C Boat Ex. 16, 17; City Ex. 3). Simultaneously with this uniform directorship replacement with O.J. Hall, Jr./family-led Investment Company personnel, Investment Company transferred its \$800,000+ harbor business to Star & Crescent Boat to continue that business in exchange for, at most, \$15,000 of newly created stock of Star & Crescent Boat and Star & Crescent Boat's assumption of \$86,000 of liabilities—grossly inadequate consideration for the significant assets conferred on Star & Crescent Boat. (S&C Boat Ex. 17).

The consideration becomes even more grossly inadequate and the marked mere continuation of the business revealed when one examines the inter-relationship of Investment Company and Star & Crescent Boat over the next several years following its creation and this asset transfer. This was clearly a family enterprise that O.J. Hall, Jr. created and controlled. While Star &



Crescent Boat focuses in its Comment on how these shares were really worth over \$700,000 and how Star & Crescent Boat paid this back to Investment Company over the next few years (after Investment Company actually gave the shares back to Star & Crescent Boat six

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months later!){For reasons unknown. As discussed further infra, the facts suggest that these transactions may also have been fraudulent in nature to escape or hide liabilities}, it leaves out the critical facts that 1) it was O.J. Hall, Jr. and family who created the alleged \$700,000 “fair market value” for this stock out of thin air on April 9, 1976, two days after Star & Crescent Boat was created, when the stock’s par value was a maximum \$15,000 (S&C Boat Ex. 17); 2) that O.J. Hall, Jr.’s children were the shareholders of Star & Crescent Boat (S&C Boat Ex. 17, 23; City Ex. 3) and 3) that Star & Crescent Boat was operationally and financially controlled by Investment Company following its creation such that any dividend payments being made by Star & Crescent Boat to Investment Company for this stock were basically payments to itself and the family business, because O.J. Hall, Jr. and Kenneth Beiriger, Investment Company officers and directors, were designating and approving the amounts of the dividends of Star & Crescent Boat! (S&C Boat Ex. 11-14; City Ex. 1-2).

The documents submitted by Star & Crescent Boat itself with its Comment undisputedly reflect that Investment Company and Star & Crescent Boat Company were closely inter-related and controlled by O.J. Hall, Jr. and family and Kenneth Beriger, and basically the same family-run company. They are discussed together in minutes of the Board of Directors meetings for Investment Company for years after Star & Crescent Boat’s creation. (S&C Boat Ex. 11-14). Discussions and proposals regarding Star & Crescent Boat were all “Approved” by O.J. Hall, Jr. and K.N. Beringer (Mr. Beiriger was also a Star & Crescent Boat director) including the designation of and approval of salaries and bonuses for Star & Crescent Boat directors in 1978; the review of Star & Crescent Boat’s operations and financials and designation of and approval of the salaries and bonuses, and dividends, of Star & Crescent Boat Company in 1979 and 1981; and Investment Company’s guaranty of a \$300,000+ loan for Star & Crescent Boat in 1981. (S&C Boat Ex. 11-14, 30).

Moreover, additional documents produced by Star & Crescent Boat reflect that Investment Company and Star & Crescent Boat Company are also discussed together in the minutes of Board of Directors meetings for Star & Crescent Boat Company in the years following Star & Crescent Boat’s creation, meetings which were at least in part led by Mr. Beiriger. Minutes from Star & Crescent Boat Board of Directors meetings from 1980 discussed Investment Company employee pay checks and stated that Investment Company and O.J. Hall, Jr. approved of Star & Crescent Boat director salaries. (City Ex. 1-2).

These facts and evidence—largely submitted by Star & Crescent Boat itself in this proceeding—demonstrate that there was not adequate consideration was paid for Investment Company’s assets, and the relationship between Investment Company and Star & Crescent Boat was such that Star & Crescent Boat was a mere continuation of Investment Company.

b. Directors and Officers of Investment Company Were Directors and Officers of Star & Crescent Boat and/or Controlled Star & Crescent Boat.

Star & Crescent Boat does not dispute that Investment Company shareholder and director O.J. Hall, Jr. was directly involved in the creation of Star & Crescent Boat in that he became a director (and President) of Star & Crescent Boat two days after its inception and remained such for six months. (S&C Boat Ex. 17; p. 10 of S&C Comment). It also does not dispute that Kenneth Beiriger was simultaneously an Investment Company director and Star & Crescent Boat

director at the same time for several years. (S&C Boat Ex. 11-14, 17, 30, p.10 of S&C Comment).

However, for some reason, Star & Crescent Boat turns a blind eye to the fact that even after O.J. Hall, Jr. stepped down as a director of Star & Crescent Boat in October 1976, he continued to control Star & Crescent Boat because he was a director and President of Investment Company, as is reflected in the numerous Board of Directors meetings of Investment Company wherein he approved Star & Crescent Boat operations, financials, director salaries and bonuses, and stock dividends. (S&C Boat Ex. 11-14, 30, City Ex. 1-2).

Star & Crescent Boat also wholly ignores the fact that the directors and shareholders of Star & Crescent Boat were all O.J. Hall, Jr.'s children. (S&C Ex. 17, 23; City Ex. 3).

The evidence clearly demonstrates officer and director overlap between the two companies, by key directors, a family-run enterprise by O.J. Hall, Jr. and his children, and control by Investment Company over Star & Crescent Boat following its creation. While director and officer overlap is not the only factor in assessing successor liability under a mere continuation theory, here, as discussed in detail, *supra*, it is certainly not the only fact demonstrating the mere continuation. When all of the facts are coupled and reviewed together with the legal standard, Star & Crescent Boat is proven to be the successor to SDMCC under the mere continuation theory.

c. Star & Crescent Boat May Have Been Created to Accomplish a Fraudulent Transfer of Liabilities of SDMCC/Investment Company.

While Star & Crescent Boat all but brushes aside this other exception to the rule against successor liability, the facts and the evidence strongly suggest that the transaction whereby Star & Crescent Boat was created with fake directors and its subsequent unsupported stock valuations and stock swaps was for a fraudulent purpose of trying to escape or hide certain liabilities.

The facts support that Star & Crescent Boat was created by Investment Company for the financial purpose of shifting assets and liabilities from Investment Company to this new entity. The installment of the initial six “directors” on April 7, 1976 was clearly a sham, given their uniform, simultaneous resignations two days later and immediate replacement by the O.J. Hall, Jr./family-led Investment Company directors. (S&C Boat Ex. 16-17). The creation of 1,500 shares of Star & Crescent Boat stock out of thin air—again, simultaneously with the installment of the O.J. Hall, Jr. family led directors—and designation by the directors that it had a par value of \$15,000 but a “fair market value” of over \$700,000—smacks of fraud. (S&C Boat Ex. 17). How could 1,500 newly created shares of a brand new company have a fair market worth of almost three-quarter of a million dollars, when at most, the capital behind them is \$15,000?

The fraudulent scheme continued when Investment Company, six months later, for unclear reasons, actually gave these shares back to Star & Crescent Boat (probably because the directors were O.J. Hall, Jr.'s children), and then was paid by Star & Crescent Boat, at least somewhat, for these shares over the next several years, out of its dividends, which dividends were designated and approved by Investment Company. Investment Company appears to have achieved payment to itself for transferring assets and liabilities to a new company, which it continued to control, as reflected on the Board of Directors meeting minutes. (S&C Boat Ex. 11-14, City Ex. 1-3). Thus, there is also a strong suggestion of fraud in the transactions creating and sustaining Star & Crescent Boat and yet another basis for a finding of successor liability.

**DTR Section:** 4.7.1.3

**Comment:**

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II.

THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS TECHNICALLY INFEASIBLE TO ACHIEVE BECAUSE UNCONTROLLED SOURCES OF POLLUTION UNRELATED TO NASSCO ARE IMPACTING SEDIMENT AT THE SHIPYARDS.

A. THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT “THE PLUME OF CONTAMINATED WATER FROM CHOLLAS CREEK DURING RAIN EVENTS HAS BEEN SHOWN TO EXTEND MORE THAN A KILOMETER FROM THE DISCHARGE POINT INCLUDING THE AREAS WITHIN NASSCO’S LEASEHOLD, AND CONTRIBUTES AN ARRAY OF POLLUTANTS TO THE SITE.”

In its comments submitted on May 26, 2011, NASSCO argues that “...The plume of contaminated water from Chollas Creek during rain events has been shown to extend more than a kilometer from the discharge point including the areas within NASSCO’s leasehold, and contributes an array of pollutants to the site. {Nassco's Comments On The San Diego Regional Water Quality Control Board Cleanup Team's September 15, 2010 Tentative Cleanup And Abatement Order No. R9-2011-0001. Draft Technical Report, And Shipyard Administrative Record ("NAASCO's Comments"),p. 35}”

The findings cited are based on studies conducted by Schiff et al (2003) and Chadwick et al (1999). The Schiff (2003) plume maps (figures 2 through 8 in Schiff (2003)) which show temperature, salinity, turbidity (beam attenuation), and toxicity results right up to the shore are likely not based directly on any data collected from these areas. Nowhere in Schiff (2003) is there mention of the authors having received access to these restricted areas to perform the sampling. The City believes the results showing the area of impacts on these figures are extrapolations based on Kriging the extent of the plume. This geostatistical method referred to as Kriging does not take into account advection, dispersion, or transformation. Where hard boundaries exist such as shorelines, Kriging will extrapolate right up to the boundary. However, in theory, advection to a hard boundary is very limited and movement toward a hard boundary tends to be via diffusion, which is a very slow process compared to advection. Schiff (2003) do not provide data indicating the Chollas Creek freshwater plume extends up to the shoreline. The use of Kriging or other geostatistical methods to predict concentrations beyond the boundaries of sampling is incorrect. Geostatistical tools are developed for characterizing data within the sampled area. Such tools have no predictive abilities, and thus should not have been used to determine the area influenced by the surface waters of Chollas Creek.

A similar deficiency is noted in the hydrodynamic model presented by Chadwick (1999). This model does not appear to take into account physical obstructions to flow such as ships docked at NASSCO piers 3-6 at the mouth of Chollas Creek, which is a typical situation. Such ships almost (or sometimes do) touch bottom at that location, which creates a physical impediment to flow from Chollas Creek to the Shipyard. The Doppler meters used to calibrate the hydrodynamic model were most likely placed outside of piers and probably could not show the effects of the piers on waters between them. Again, the locations of the Doppler meters are not provided in the report and so it is impossible to review this data. Also this model uses a 100

meter grid which cannot be reasonably used to conclude movements of sediments at the scale of Chollas Mouth which is less than 100 m wide. Collectively these issues with the hydrodynamic modeling efforts in the shoreline area indicate model predicted results for this area are inaccurate.

So, while data collected during the 1999 period when the Chadwick study was being conducted and subsequently showed plumes of Chollas Creek water extending into San Diego Bay, there is no data showing that this Chollas Creek water or sediments from Chollas Creek circulate up to the remedial footprint of the shipyards site.

The U.S. Navy SPAWAR conducted a modeling study of discharges of sediments from Chollas Creek (Chadwick, et al, undated). They used sediment discharge data measured in Chollas Creek in 2001. In this study SPAWAR modeled 10 years of storms from Chollas Creek and the movement of sediments into San Diego Bay using a 3 dimensional estuary model. SPAWAR estimated that 46 to 92% of sediments discharging from Chollas Creek would be trapped in the creek mouth and not enter San Diego Bay. The amount of trapping would be dependent on the size of storm. Smaller storms would result in greater trapping in the mouth and larger storms would result in lower trapping in the mouth.

If Chollas Creek was a source of chemicals of concern (COCs) to the Shipyard, one would expect to see decreasing concentrations from Chollas Creek to the Shipyards site. When looking at the chemical concentrations of the COCs in Chollas Creek sediments, there is not a chemical gradient starting at Chollas Creek and decreasing to the Shipyards. Looking at Cadmium, which is not a COC, but which is more representative of urban runoff, there are gradients of Cadmium leading from Chollas Creek to the Shipyards. Based on this analysis of chemical gradients, the City submits that Chollas Creek is not a significant contributor of COCs to the Shipyard site.

If Chollas Creek was a source of COCs to the Shipyard, one would expect to see similar ratios of COCs in the Chollas creek mouth as one sees in other Shipyard sediment locations. When COC ratios are analyzed to evaluate differences or consistencies between locations, it appears that COC ratios are not consistent between the shipyards area and the mouth of Chollas Creek. Thus, the City concludes that Chollas Creek is not a source of Shipyard site COCs (Cu, PCB, Hg or TBT).

The statements made by NASSCO and RWQCB staff under deposition regarding how Chollas Creek is impacting the Shipyards sediment site outside the mouth of Chollas Creek are speculative and not based on any direct measurements or well calibrated field-verified models.

#### **B.THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT "...THE STORM WATER CONTAINS PCBs, PYROGENIC HYDROCARBONS, OIL AND GREASE, SYNTHETIC ORGANICS, AND HEAVY METALS, AMONG OTHER POLLUTANTS."**

In its comments submitted on May 26, 2011, NASSCO argues that "...The storm water contains PCBs, pyrogenic hydrocarbons, oil and grease, synthetic organics, and heavy metals, among other pollutants. {NASSCO's Comments, p36}"

In fact, PCBs have never been detected in Chollas Creek water. In fact, the RWQCB discontinued the requirement for PCB monitoring in Chollas Creek because PCBs had never been detected. PCBs found in Chollas Creek mouth or Shipyard sediments are likely from sources other than Chollas Creek.

C.THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT "TO THE EXTENT MINOR IMPACTS ARE OBSERVED AT NASSCO, TRIAD RESULTS SUGGEST THAT CONTAMINANTS FROM CHOLLAS CREEK, NOT THE SHIPYARDS, ARE LINKED TO THE OBSERVED ENVIRONMENTAL IMPACTS."

In its comments submitted on May 26, 2011, NASSCO argues that "to the extent minor impacts are observed at NASSCO, triad results suggest that contaminants from Chollas Creek, not the shipyards, are linked to the observed environmental impacts {NASSCO's Comments, p. 36-38}." NASSCO then proceeds to argue that "...For example, stations NA20 and NA22 – which are not associated with shipyard-related chemicals, but are within the area of apparent sediment deposition from the Chollas Creek stormwater plume – are the only stations in the NASSCO leasehold with apparent benthic effects under the DTR analysis.."

NA20 and NA22 are located next to the piers where full thrust engine testing takes place, resulting in significant physical disturbance to the underlying sediments. Navy collected bathymetry data shows sediment elevation contours in this area suggesting of significant "blow-out" of sediments, likely from propeller activity during engine testing. The physical disturbance may be the factor affecting the benthic community. In fact, levels of chemicals of concern throughout the shipyard sediment site do not correlate with observed benthic community effects. However, at the only locations where significant physical disturbances take place routinely, benthic community effects are observed.

Next, in support of the same proposition that triad results suggest that contaminants from Chollas Creek, not the shipyards, are linked to the observed environmental impacts, NASSCO argues NASSCO argues that correlations are observed between pesticide concentrations and sediment toxicity and that "there is clear evidence that pesticides – which are not shipyard-associated chemicals – may be responsible for adverse biological effects observed at the shipyards, particularly adverse effects to bivalves {NASSCO's Coments, p. 36}."

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This statement drawn from conclusions made in the Exponent Report (Exponent, 2003) was based on only four samples. Four samples do not provide sufficient statistical power to conclude that there is or is not a correlation. Correlation analysis conducted on other chemicals of concern utilized upwards of 60 samples. The conclusion that there is "clear evidence that pesticides ...may be responsible for adverse effects..."should not be drawn on the basis of 4 samples.

Next, in support of the same proposition that triad results suggest that contaminants from Chollas Creek, not the shipyards, are linked to the observed environmental impacts, NASSCO argues NASSCO argues that "Urban Runoff from Chollas Creek Is A Significant Contributor of Pollutants To The Shipyard {NASSCO's Comments, p. 37-38}."

Conclusions regarding the fate and transport of sediments from Chollas Creek are based on:

- no direct measurement of sediment loads to the inner portions of the shipyard site.
- The use of a technique called Kriging from points in the Bay where turbidity and toxicity data were measured during a storm to the shoreline. This technique is a mathematical algorithm for estimating the difference in concentrations between two known points and does not take into account the hydrodynamic effects of hard barriers to flow and sediment flux that are found at the Shipyard inner site. This technique is inappropriate for drawing conclusions on fate and transport of suspended sediments and does not accurately estimate sediment transport.

No comparison of mass discharges from Chollas Creek that may have migrated to the inner Shipyard area with mass discharges from historical shipyard operations were made. Statements made regarding the contribution of Chollas Creek to the inner Shipyard area are speculative and not based on any direct data or well calibrated models.

Comparisons conducted by the City of mass discharges from Chollas Creek that may have migrated to the inner Shipyard area with likely mass discharges from historical shipyard operations suggest that the amount of chemical of concern mass at the shipyard site is more than 98% from shipyard operations. The concentrations within storm water are far lower than the concentrations in Shipyard waste discharges that were likely to occur prior to the enforcement of regulatory restrictions on those discharges began in the 1980s.

Next, in support of the same proposition that triad results suggest that contaminants from Chollas Creek, not the shipyards, are linked to the observed environmental impacts, NASSCO argues NASSCO argues that Observed Toxicity and Benthic Community Effects Are Attributable to Discharges Of Municipal Storm Water. Further, that "...the presence of pesticides, and the observed correlations between pesticides and toxicity, suggest that Chollas Creek and storm sewer discharges from areas outside the shipyards are contributing toxic levels of pesticides (and other chemicals) to shipyard sediments, and are also responsible for any observed effects. {NASSCO's Comments, p. 38}"

This statement drawn from conclusions made in the Exponent Report (Exponent, 2003) was based on only four samples. Four samples do not provide sufficient statistical power to conclude that there is or is not a correlation. Correlation analysis conducted on other chemicals of concern utilized upwards of 60 samples. The conclusion that Chollas Creek is causing observed toxicity because of pesticides should not be drawn on the basis of 4 samples.

Additionally, as stated elsewhere in responses to other NASSCO comments, the studies to date on the fate and transport of sediments from Chollas Creek do not show sediments migrating to the inner Shipyards site. Organochlorine pesticides would be attached to sediments due to their hydrophobicity. Studies to date show most (46% to 92% depending on the storm) of sediments remaining trapped in the Chollas Creek mouth and not even extending out to San Diego Bay. Of those that continue to the shipping channel in San Diego Bay during larger storms, data and modeling studies do not show significant migration to the inner shipyard.

#### D.THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT "REMEDIATION GOALS CANNOT BE MET DUE TO RE-CONTAMINATION FROM OTHER SOURCES."

In its comments submitted on May 26, 2011, NASSCO argues that "Remediation Goals Cannot Be Met Due to Re-Contamination From Other Sources {NASSCO's Comments, p. 38-39}." The City is committed to complying with the Chollas Creek metals TMDL. While actions are not required prior to 2018, 80% reduction is required by 2018. The City has analyzed and evaluated different means of achieving compliance and is currently developing a plan that the City believes should achieve compliance. There are numerous technologies more effective (and not more costly) than sand filters at removing metals, including dissolve fractions, that are being considered for implementation throughout the Chollas Creek watershed.

As noted in responses to comments above, the discharges from Chollas Creek do not significantly affect inner Shipyard sediments. Predictions of mass discharges from Chollas

Creek of copper, zinc, and lead as the TMDL is being implemented suggest that there will be no measureable increase in sediment concentrations of these constituents after remediation of Shipyards is complete. Accordingly, there should be no concerns that remediation goals cannot be met because of any concerns regarding recontamination from Chollas Creek.

**Comment ID:** 285

**Organization:** City of San Diego

**DTR Section:** 9

**Comment:**

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III.

SAN DIEGO GAS & ELECTRIC ("SDG&E") IS APPROPRIATELY NAMED AS A DISCHARGER.

As demonstrated below, there is copious evidence that SDG&E's operations caused or contributed to discharges of the subject pollutants into the Shipyard Site.

A.THERE IS SUFFICIENT EVIDENCE TO SHOW THAT PCBs WERE RELEASED FROM THE SDG&E SILVERGATE SUBSTATION/SWITCHYARD AREA AND THAT THE CONDITIONS AT THIS SUBSTATION/SWITCHYARD LED TO THE SUBSEQUENT DISCHARGE OF PCBs INTO THE STORM DRAIN IN SAMPSON STREET AND, ULTIMATELY, TO THE SHIPYARDS SITE AND SAN DIEGO BAY.

The TN& Associates 2006 Underground Storage Tank closure report presents analytical results of samples collected from soils in the substation area beneath and adjacent to the closed underground storage tanks. These analytical results show concentrations of PCBs ranging from 56 to 125,000 micrograms per kilogram. The maximum concentration is higher than contamination found in the Shipyards sediments. Shipyard sediment site background is 84 micrograms per kilogram.

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The RBF 2006 Water Quality Technical Report and the 2006 SDG&E Hydrology report for the Silvergate substation/switchyard upgrade and modification project both state that "Approximately 3.0 acres of the site currently drains by means of surface flow to Sampson street." Both reports go on to state "The site drains to the west side of Sampson Street where runoff flows to a curb inlet and catch basin (prior to the intersection of the railroad tracks on Sampson Street." This evidence shows that: 1) PCBs were released to soils at the substation/switchyard, and 2) the substation/switchyard drained to the Sampson street storm drain, which City drawings show leads to the Shipyards Sediment site and San Diego Bay. Therefore, PCBs were released at the substation/switchyard. Rainwater left the substation/switchyard and entered Sampson Street, the storm drain, and San Diego Bay.

SDG&E has not presented any documentation or testimony stating that they removed released PCBs from substation/switchyard soils prior to a rain event or that they took any steps to treat runoff to remove PCBs from that runoff before leaving the substation/switchyard. SDG&E has produced no documentation or testimony stating that the transformers, capacitors, or other PCB containing equipment or vessels in the substation/switchyard were placed in secondary containment at the time of construction in the 1940s (SAR193281). The presence of secondary

containment in 2004 as cited in the ENV America 2004 site investigation report (SAR193281) is not evidence of secondary containment having been put in place at the time of original construction. The standard practice in the 1940s for transformer and capacitor construction was to not place them in secondary containment because in the 1940s there were no regulations requiring that secondary containment be installed for these devices. In fact, the presence of PCBs in substation/switchyard soils during demolition in 2006 is direct evidence that SDG&E did not take steps to remove PCBs that had been released from soils at the substation/switchyard.

**B.THERE IS SUFFICIENT EVIDENCE TO SHOW THAT SDG&E DISCHARGED PCBs TO THE SHIPYARDS SITE AND SAN DIEGO BAY VIA THE COOLING TUNNELS.**

The 2006 SDG&E Hydrology Report states: “The roof and cooling water deck (south-west of the powerhouse) currently drain into the cooling water tunnels.” September 10, 1974, SDG&E Internal Correspondence (SAR193394) states that turbine room sump pumps discharged to the cooling water discharge tunnel. Silver Gate Power Plant Waste Water Treatment Facility Training Manual (No Date) states: “The floor drains are in areas where large amounts of oil may be spilled.” (SAR193675). San Diego Gas and Electric Spill Prevention Control and Countermeasure Plan Silver Gate Power Plant (October 27, 1981) listed the following specific equipment in the turbine room and on the cooling water deck:

- (35-50KW) Steam Turbine – Generator Sets
- 8 (2,500 to 3,000 gallon) Turbine Lubricating Oil tanks
- Power and 2 Lighting Transformers Near GU 2 on CW Deck
- Auxiliary and 1 Lighting Transformers Near GU 1 on CW Deck

A U.S. EPA report published September 25, 1976 titled “PCBs in the United States Industrial Use and Environmental Distribution” lists the uses of PCBs in Heat Transfer fluids, Hydraulic Fluids, Lubricants, Transformers, Capacitors, Plasticizer Applications, and Miscellaneous Industrial. A Monsanto sales manual for PCBs published in 1944 states that the primary benefit of PCBs is how they stabilize oils under high temperature conditions. It is easy to conclude from this fact record that the SDG&E turbines and transformers used PCB containing oils because of the high temperatures at which they operated. One can also conclude that the turbines leaked oils. The presence of lubricating oil tanks is evidence that a reserve of oil for the turbines was necessary for the turbines to operate. Therefore, the turbines must have lost oil. Oil is not a volatile substance, so the primary means of loss would be through leaks. The leaks from the turbines would have been collected in the turbine sumps and pumped to the cooling water lines as stated in the above cited documents. Therefore, there is a direct link between turbine leaks and discharges in the cooling water lines. SDG&E has provided no documentation or testimony stating that they did not use PCB containing oils in their turbines, hydraulic systems, or transformers. SDG&E has not provided any evidence or testimony showing that the turbines never leaked.

Simply put, because concentrations of PCBs in cooling water tunnel sediments or sediments near cooling water tunnels are lower in concentration than in other Shipyard sediments is not sufficient evidence to prove that no PCBs were ever discharged from the cooling water tunnels. In fact, the presence of any PCBs in the cooling water tunnels is evidence that PCBs were



discharges and that the cooling water discharge is one of the sources of PCBs in the Shipyards site and San Diego Bay.

**C.THE PCBs DETECTED IN CATCH BASIN CB1 IS FURTHER EVIDENCE THAT SDG&E HAD DISCHARGED PCBs TO THE SAMPSON STREET STORM DRAIN AND SUBSEQUENTLY TO THE SHIPYARDS SEDIMENT SITE AND SAN DIEGO BAY.**

PCBs were detected In CB-1 after a visual inspection suggested that sampling was warranted. The 2006 TN and Associates letter presenting the results of their investigation of what drains led to the catch basin stated that a 6 inch roof drain led to the catch basin from the SilverGate Power Plant. This statement was not documented with any as-built drawings showing the 6 inch roof drain. No photos of the roof drain were presented. Samples were collected from the roof. Samples contained PCBs ranging from non detect to 1,400 micrograms per kilogram. 1,400 micrograms per kilograms is higher than found in most Shipyard sediment samples. Shipyard background was set at 84 micrograms per kilogram, which was established to take into account general urban activity, which would include atmospheric deposition.

Irrespective of whether the investigators discovered a specific source on the roof, the high sample showed that there had been a release to the roof materials, whether from the constituents within the roof materials themselves, or from a release from the power plant resulting in deposits on the roof. The drainage of the roof is stated to lead to CB-1. PCBs were detected in CB-1. Drawings of CB-1 show that it leads to SW4 in Sampson Street, which leads to the Shipyards Site and San Diego Bay. Therefore, there is evidence showing: 1) a release of PCBs to the roof of the Silvergate Power Plant, 2) transport from the roof of the Silvergate Power Plant to CB-1, 3) the presence of PCBs in CB-1, and 4) transport from CB-1 to the Shipyards Site and San Diego Bay.

**D.THERE IS SUFFICIENT EVIDENCE TO SHOW THAT THE SDG&E SILVERGATE POWER PLANT BILGE PUMPING SYSTEM THROUGH NOBLES LAKE DISCHARGED PCBs AND OTHER WASTES TO THE SHIPYARDS SITE AND SAN DIEGO BAY.**

The September 10, 1974, SDG&E Internal Correspondence (SAR193834) presents the figure shown below (Figure 1). This figure clearly shows that the bilge pumps lead to an 8 inch pipe that leads to Nobles Lake. The bilge pumps emptied the basement of the Silvergate Power Plant, which contained boiler blow down tanks, boiler pumps, and hydraulic systems. Figure 2 from Technical Report for RWQCB Investigation Order No. R9-2004-0026 Silver Gate Power Plant, San Diego, CA July 14, 2004, ENV America Inc., shows the wastes discharged from the Silvergate Power Plant. (SAR193272-SAR193329). This figure clearly documents oily wastes being discharged directly to San Diego Bay, either through Nobles Lake or through the Cooling Water Discharge.

Figure 3 from the same ENV America report, shows the Nobles Lake area. This 1950 aerial photo also shows a ditch leading directly to the Shipyards site and San Diego Bay.

Figure 4 from the same ENV America report, also shows the Nobles Lake area. This 1952 aerial photo shows a new pond dug in the vicinity of Nobles Lake and the ditch, but not directly on Nobles Lake or the ditch.

Figure 5 from the same ENV America report, also shows the Nobles Lake area. This 1953 aerial photo shows the new pond no longer there, but Nobles Lake and the ditch are clear in the photo.

Figure 6 from the same ENV America report, purportedly taken in 1955 shows the Nobles Lake releasing oily wastes to the surface and to the ditch leading to San Diego bay.

The ENV America report (2004) states: “Basement bilge water consisted of liquids that accumulated in trenches in the plant basement. The WWTP manual (SDGE 1978) lists the following waste sources: turbine drains, boiler drains, condenser drain, pump drains, cooling water supply drains, water box drains, service air compressor drains, fire pump drains, relief valve drains, condensate storage and overflow, and condensate makeup pump drains. The basement bilge system was divided into two areas: the turbine side and the boiler side. Diagrams from 1965 show that bilge water from the turbine side was piped into the discharge cooling water tunnels and the bilge water from the boiler side was pumped via an 8 inch diameter pipeline to an oil-water separating pond located on Parcel 2 referred to as ‘Nobles Lake,’ which was used for evaporation and settling. However it is noted that an ACE application SDGE 1972 stated that only blowdown and cooling water were discharged to the CW tunnels whereas other wastes were disposed of by evaporation, discharge to sewer, or offsite disposal. Some water from the pond was discharged to the Bay. (SAR193289)

In a SDG&E internal correspondence dated September 10, 1974, A.W. Hovland wrote “ The oil-water settling pond known as “Nobles Lake” is presently filled to overflowing condition, thus the discharge from Silver Gate will eventually find a path to the San Diego Bay.” (SAR193394)

Figure 7 shows the sampling locations of the SDG&E tidelands lease area (ENV America, 2004).

Figure 8 shows a 1952 aerial photo with the sampling locations from the 2004 ENV America report overlaid on the site. Note the ENV America investigation did not sample the oil/water separator location, known as “Nobles Lake” or the ditch running along the fenceline to San Diego Bay. The investigation focused primarily on the pond that aerial photos showed existed only from 1951 or 1952 to 1952. However, historical aerial photos and documents show the oil/water separator and ditch existing from at least 1950 to 1974. Therefore, the ENV America (2004) sampling results would not adequately characterize residual contamination in the tidelands due to SDG&E documented waste management operations in that area.

Figure 9 shows the approximate location of Nobles Lake based on analysis of aerial photos, the assumed location of Nobles Lake in the ENV Americas 2004 investigation, and another location for Nobles Lake based on a 1974 SDG&E memo. The ENV Americas 2004 investigation apparently relied on the 1974 SDG&E memo and did not use historical aerial photos to identify true location of the oil/water separator and ignored the ditch observed in the aerial photos. The diagram also shows a discharge pipe from Nobles Lake to San Diego Bay. The investigation did not locate this pipe.

A U.S. EPA report published September 25, 1976 titled “PCBs in the United States Industrial Use and Environmental Distribution” lists the uses of Aroclor 1242, 1248, 1254, and 1260 in hydraulic oils; 1248 and 1254 in vacuum pumps; 1242 in turbines; 1242, 1254, and 1250 in transformer oils; and 1242 and 1254 in capacitors.

Data from the Shipyards sediment investigation show Aroclor 1242 and 1248 at higher relative concentrations in the northern end of the Shipyards site closer to the ditch leading from Nobles Lake, and 1254 and 1260 at higher relative concentrations near the SW4 outfall, which drained the substation/switchyard. Discharges from Nobles Lake to the northern end of the

Shipyards site near the BAE Pier 1 area, based on the fact record, would have contained oils from hydraulic systems, pumps, and turbines, which would be expected to be higher in relative concentration of Aroclor 1242 and 1248. Discharges from the substation/switchyard would have contained oils from transformers and capacitors, which would be expected to have higher relative concentration of Aroclor 1254 and 1260. Shipyard sediment Aroclor data show these general trends.

In conclusion, the evidence shows:

- PCBs were a component in oils within the Power Plant.
- Oils spilled within the boiler room side of the power plant were intentionally pumped to an oil/water separator called “Nobles Lake”
- Nobles Lake discharged oily waste to the Shipyards Sediment site and San Diego Bay, at a minimum, via a ditch observable in numerous aerial photos, and possibly via a discharge pipe.
- Aroclor ratios found in Shipyard sediments reflect the different types of wastes that were discharged from Nobles Lake and from the substation/switchyard.

The investigations conducted by SDG&E and their consultants to date have not adequately characterized the discharges or residual contamination left from these operations and do not refute the evidence showing the discharge of PCBs to the Site. The Aroclor mix in the Shipyard sediment site reflect the conceptual site model of the different waste types produced by SDG&E and their discharge locations and transport pathways.

**Comment ID:** 286

**Organization:** City of San Diego

**DTR Section:** 11

**Comment:**

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IV.

THERE IS SUFFICIENT EVIDENCE TO CONCLUDE THAT THE PORT HAS RESPONSIBILITY FOR DISCHARGES FROM ITS MS4 FACILITIES.

In its comments submitted on May 26, 2011, the Port argues that because it does not own SW4 and SW9 of the MS4 permits, that its status as co-permittee under the NPDES permit for MS4 discharges does not make it liable for discharges into or from that part of the MS4 system{The San Diego Unified Port District's Submission of Comments, Evidence and Legal Argument, p. 13-16}.

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The MS4 permit requires all co-permittees to prohibit discharges into its MS4 system. The agreement between the co-permittees is that each co-permittee will implement programs to prevent discharges to the MS4 that runs through its jurisdiction. The Port District is a unique entity in that it is an overlay entity. The land within the Port District is also incorporated in the City of San Diego. However, the Port District has all rights of inspection and action on the land within its jurisdictional boundaries – namely, the tidelands. The City may have the easement that allows the storm drain to pass through the tidelands to drain the upland areas and tideland areas. But, the Port District is fully responsible, both under the MS4 permit and under its agreements with the co-permittees, to take all necessary actions to prevent discharges of

pollutants into the MS4 system that runs through lands that are under the Port District's jurisdiction. Thus, to the extent there is any determination that discharges of the subject pollutants from the MS4 system have caused or contributed to a condition or nuisance or pollution at the Site, the Port should be liable as a Discharger.

**Comment ID:** 287

**Organization:** City of San Diego

**DTR Section:** 33.1.1

**Comment:**

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V.

#### THE PROPOSED REMEDIAL FOOTPRINT PROPERLY EXCLUDES POLYGON NA22.

The Coast Keeper / Environmental Health Coalition (“EHC”) comments state that the “Proposed Remedial Footprint excludes eight polygons that, under the DTR’s own methodology, should have been included” and that “[t]he Proposed Remedial Footprint improperly excludes NA22” and that “[t]he DTR acknowledges that polygon NA22 is “Likely” impaired and should be remediated because Contaminants of Concerns in sediments are likely adversely affecting benthic invertebrates within this polygon {San Diego Coastkeeper and Environmental Health Coalition Technical Comments, Legal Argument, and Evidence (“EHC Comments”), p.25-26}.”

In reply, NA22 is located next to the piers where full thrust engine testing takes place, resulting in significant physical disturbance to the underlying sediments. Additionally, tugboat movements throughout the day and night most days of the year and large ship movements to and from piers in the Mouth of Chollas Creek further disturb sediments. Navy collected bathymetry data shows sediment elevation contours in this area suggesting of significant “blow-out” of sediments, likely from propeller activity during engine testing. The physical disturbance may be the most significant factor affecting the benthic community. In fact, levels of chemicals of concern throughout the shipyard sediment site do not correlate with observed benthic community effects. However, at the only locations where significant physical disturbances take place routinely, benthic community effects are observed.

EHC also comments that “The TMDL process cannot provide a vehicle for remediating contaminated sediment within the NA22 polygon. A new and separate remediation process—another Cleanup and Abatement Order—would need to be initiated after completion of the Creek Mouth TMDL to address existing contaminated sediment in NA22, if it is not remediated under the current Order. When asked in depositions, no Cleanup Team member could point to a TMDL that had been implemented through dredging. This means that removing NA22 from the Proposed Remedial Footprint virtually guarantees that it will never be dredged—even though the DTR agrees that it is “Likely” impaired. Furthermore, TMDLs are given a long time period—typically twenty years—before they need to be implemented. Adding this delay together with the time it would take to develop another cleanup and abatement order to address NA22 means that any possible cleanup of NA22 would not be for decades down the road. It is a waste of time and resources to put off remediating NA22 when a framework for its remediation has already been established in this process {EHC Comments, p. 26}.”

In reply, the upper and lower Newport Bay organochlorine compound TMDL includes stipulations in its implementation plan for dredging of sediments in addition to special studies, natural attenuation, and discharge controls. The dischargers, among numerous other

requirements, are to submit a report that “Evaluate[s] feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay.” See Santa Ana Regional Water Quality Control Board Resolution No. R8-2007-0024 (City Ex. 4). It is not unheard of to use a TMDL to compel a discharger to remediate contaminated sediments. It is the expectation of the City that the Regional Board will use the Chollas Mouth TMDL to compel dischargers to take necessary actions to mitigate the impairment and another cleanup and abatement order will not be necessary.

**Comment ID:** 288

**Organization:** Star & Crescent

**DTR Section:** 5

**Comment:**

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REPLY COMMENT I

Star & Crescent Boat Company is Not a Successor to San Diego Marine Construction Company.

S&C Boat submits this reply comment in response to Designated Party Campbell Industries, MCCSD, and San Diego Marine Construction Corporation’s (“Campbell’s”) Comment No. 1, which states:

San Diego Marine Construction Company (subsequently Star & Crescent) did not sell its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972. In Finding 6 of the Draft Technical Report, in the first sentence of the second paragraph of Section 6.3.1, it states, “San Diego Marine Construction Company (subsequently Star & Crescent) sold its leasehold to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972.” This statement is incorrect. San Diego Marine Construction Company (subsequently Star & Crescent) sold the business and assets of its Marine Division to MCCSD, a wholly owned subsidiary of Campbell Industries in July 1972.

(“Designated Party Campbell Industries Comments on Draft Technical Report,” p. 1, lines 12-20 (emphasis added).)

As written, it is not clear to which entity Campbell refers when it uses the term “Star & Crescent” in its comment. To the extent that the comment purports to state that San Diego Marine Construction Company (“SDMCC”) became S&C Boat, the comment is inaccurate.

As reflected in S&C Boat’s May 26, 2011 comment submittal, SDMCC was comprised of three divisions: the Marine Division (which operated on the Shipyard Sediment Site), the Boat Division (which operated the harbor excursion business north of the San Diego-Coronado Bay Bridge), and the Investment Division {United States Tax Court’s opinion in Estate of Oakley J. Hall, Deceased, Southern California First National Bank, Executor v. Commissioner of Internal Revenue (1975) (attached as Exhibit 1 to S&C Boat’s May 26, 2011 comment letter), pp. 1 and 3.}. In 1972, Campbell purchased SDMCC’s interest in the Shipyard Sediment Site and SDMCC surrendered its Shipyard Sediment Site {See Exhibit 1 to S&C Boat’s May 26, 2011 comment letter, p. 8.} lease with the Port. Campbell later entered into its own lease with the Port

for the Shipyard Sediment Site {Surrender Port Lease, dated July 14, 1972 ( attached as Exhibit 8 to S&C Boat's May 26th, 2011 comment letter); and Port District Ordinance Accepting Surrender of Lease from SDMCC (attached as Exhibit 9 to S&C Boat's May 26th, 2011 comment letter).

Thereafter, also in 1972, SDMCC changed its name to Star & Crescent Investment Company (“Investment Co.”) {Certificate of Ammendment of Articles of Incorporation (attached as Exhibit 10 to S&C Boat's May 26, 2011 comment letter)}. It was not until 1976, four years after the sale of the shipyard business and surrender of the Shipyard Sediment Site lease that S&C Boat was incorporated {Articles of Incorporation of S&C Boat, filed on April 7, 1976 (attached as Exhibit 16 to S&C Boat's May 26, 2011 comment letter)}. Following its incorporation in 1976, S&C Boat purchased only specified assets of the Investment Co.’s harbor excursion business {Minutes of Meeting of Board of Directors of S&C Boat dated April 9, 19876 (attached as Exhibit 17 to S&C Boat's May 26, 2011 comment letter)}. S&C Boat did not purchase all assets and liabilities of Investment Co., but, as documented in S&C Boat’s May 26, 2011 comment letter, only purchased very limited assets of Investment Co., and Investment Co. continued to own and operate assets unrelated to S&C Boat until 1991.

Thus, for the reasons described herein and explained in further detail in S&C Boat’s initial comment submission dated May 26, 2011, S&C Boat has no knowledge of, and never had any involvement with, the business or assets of SDMCC’s Marine Division. While San Diego Marine Construction Company did change its name to Star & Crescent Investment Co., San Diego Marine Construction Company did not subsequently become Star & Crescent Boat Company.

**Comment ID:** 289  
**DTR Section:** 5

**Organization:** Star & Crescent

**Comment:**

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REPLY COMMENT II

The Port’s Reference to S&C Boat’s Alleged Insurance Assets is Inaccurate and Improper.

S&C Boat submits this reply comment in response to Designated Party San Diego Unified Port District’s (“Port’s”) Comment No. III (A) (5), which states:

Based on its review of relevant documents, the Port believes that Star & Crescent has millions of dollars of liability coverage that would be potentially applicable to the remediation and monitoring efforts. Additionally, Star & Crescent has stipulated that it has assets totaling between \$750,000 and \$1 million. [...]

The Port is aware that the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site. [...] Regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site, the identified insurance assets would still

apply, so long as the insured entity is named as a discharger under the TCAO and DTR. Thus, if the TCAO and DTR were amended to name all of the potentially liable entities - San Diego Marine Construction Company, Star and Crescent Boat Company and Star & Crescent Investment Co. -- the insurance assets should be available to address directly any established liability, whether or not these entities are still in existence.

(“San Diego Unified Port District’s Submission of Comments, Evidence and Legal Argument,” pp. 10-11 (citations omitted, emphasis added).)

The Water Board must reject the Port’s assertion that certain additional entities be named to the TCAO and DTR purely based upon their potential insurance coverage. Consideration of such facts by the Water Board would be contrary to fact and would violate established legal doctrine regarding the admissibility of such insurance information.

The Water Board is charged with making a determination about whether S&C Boat is a “discharger” responsible for costs associated with remediating or monitoring contamination at the Shipyard Sediment Site. The only relevant inquiry in determining whether a party is a “discharger” is whether there is a basis in law to attach “discharger” or responsible party obligations. For the reasons stated in its May 26, 2011 submission of comments, S&C Boat is not liable because it did not directly contribute to the contamination and is not liable under the law for any contamination caused by any other entities.

Making inquiries and assumptions about whether S&C Boat has insurance proceeds available to pay for remediation of contamination for which it is not liable is inappropriate {This inquiry is just as inappropriate as, and no more unreasonable than, if the Water Board were asked to consider the status of Wal-Mart's insurance coverage for the purpose of paying for remediation of the Shipyard Sediment Site. Like Wal-Mart, S&C Boat has no liability for the contamination caused at the Shipyard Sediment Site, and therefore, any question about availability of insurance coverage is both inappropriate and irrelevant.}. Although S&C Boat understands that the possibility of accessing a large insurance policy’s proceeds might seem attractive to the Port and the Water Board, where there is no right to those proceeds, the existence of insurance does not matter. The only proper question is that of legal liability.

#### A. The Port’s Reference to the Existence and Amount of Alleged Insurance Coverage Is Not Factually Supported.

The Port alleges that S&C Boat has “millions of dollars of liability coverage” for remediation and monitoring activities. The Port’s allegations are inaccurate to the extent they attempt to establish that S&C Boat has insurance coverage, or that a certain amount of insurance funds are available to respond to remediation efforts. That statement is not supported by any facts, is wildly speculative, and misleads the Water Board into believing that if it were to assign liability to S&C Boat, there would be ample funds available for cleanup efforts.

At this time, despite diligent efforts, S&C Boat has not obtained any insurance proceeds and, despite tendering claims to numerous insurance carriers, has received no agreement for defense

or indemnity from any insurance carrier. Nevertheless, consideration of these facts by the Water Board is inappropriate.

#### B. Reference to Alleged Insurance Coverage Violates the Rules of Evidence, Is Irrelevant to the Shipyard Sediment Site Matter, and Is Prejudicial to S&C Boat.

Even assuming the Port District's allegations regarding insurance proceeds were true, the Water Board's consideration of this information would violate established legal doctrine regarding the admissibility of such evidence. Further, such evidence is irrelevant to the issue about which the Water Board is responsible for making a determination – the issue of liability. Finally, suggestion that such insurance coverage exists is prejudicial to S&C Boat.

The law is clear that evidence of insurance is inadmissible to prove wrongdoing. The California Evidence Code specifically states that “[e]vidence that a person was, at the time a harm was suffered by another, insured wholly or partially against loss arising from liability for that harm is inadmissible to prove negligence or other wrongdoing.” (Cal. Evid. Code § 1155.)

Further, the question of insurance is irrelevant. Whether S&C Boat has insurance coverage has no bearing whatsoever on the issue before the Water Board - whether S&C Boat is legally responsible for the alleged acts of another corporate entity. The only appropriate inquiry is whether S&C Boat meets the legal requirements for liability, which it does not. The existence or absence of insurance coverage is of no consequence to the matter before the Water Board and is not relevant.

Courts routinely give juries specific instructions on this very issue. The standard rule provided to jurors is: “You must not consider whether any of the parties in this case has insurance. The presence or absence of insurance is totally irrelevant. You must decide this case based only on the law and the evidence.” (Judicial Council of California Civil Jury Instructions (2011), No. 105 (emphasis added).) In this matter, the Water Board is subject to a similar requirement, and must consider only relevant facts and law.

Last, introduction of such evidence is prejudicial to S&C Boat. Discussion of this irrelevant information could improperly encourage the Water Board to make its decision regarding liability based on information having nothing to do with the facts or law regarding liability. Improperly (and inaccurately) suggesting that S&C Boat has the ability to pay for cleanup from insurance proceeds misdirects the Water Board's focus from the only legitimate issue before it – that is, liability – under which its task is to determine whether S&C Boat bears any responsibility for the contamination in the first place.

In a case where a trial court had discussed evidence of an alleged wrongdoer's insurance coverage, a California Court of Appeal reversed the judgment, stating that such evidence is both irrelevant and prejudicial. (*Blake v. E. Thompson Petroleum Repair Co.* (1985) 170 Cal.App.3d 823, 830 (citations omitted).) The courts have made specific findings that the existence of liability insurance is irrelevant to the question of liability. (*Bell v. Bayerische Motoren Werke Aktiengesellschaft* (2010) 181 Cal.App.4th 1108, 1122-1123.) In fact, attempts to introduce such evidence are sometimes considered so inappropriate and such a flagrant violation of the law that they can constitute grounds for attorney misconduct. (*Blake* at 830, citing *Neumann v. Bishop* (1976) 59 Cal.App.3d 451, 469; *Witkin, Cal. Evidence* (2d ed. 1966) § 374, pp. 332-333.)



Evidence regarding alleged insurance coverage has nothing to do with the Water Board's task of determining whether S&C Boat bears liability for the actions of a separate corporate entity. It is inadmissible, irrelevant, and prejudicial, and must be disregarded.

**C. The Port's Suggestion to Name Additional Entities Is Inappropriate and Not Factually Supported.**

The Port District's suggestion that the Water Board should name S&C Boat simply to access insurance proceeds, "regardless of whether the current Star & Crescent entity is liable for the earlier operations at the Shipyard Sediment Site" is inappropriate and lacks any factual basis. The Water Code requires a legal determination be made to name a party as a "discharger" in a Cleanup and Abatement Order. Only a person who discharges waste into the waters of the state, creating a condition of pollution or nuisance, is liable under the statutory mandates of the Water Code. (Cal. Water Code Sec. 13304(a).) The Water Code liability is without regard to insurance proceeds.

As documented in S&C Boat's May 26, 2011 submission, there is no evidence that S&C Boat is directly liable for the contamination, or that S&C Boat is the legal successor to any liable party. That should end the inquiry by the Water Board. The availability of insurance (or the lack thereof) is not a valid consideration in making that legal determination.

**Comment ID:** 290

**Organization:** Port District

**DTR Section:** 5

**Comment:**

The San Diego Unified Port District (Port) submits the following response to Star & Crescent Boat Company's (S&C Boat) comments on the Tentative Cleanup and Abatement Order (TCAO) and Draft Technical Report (DTR). S&C Boat asks to be removed from the TCAO/DTR as a "discharger" on the grounds that it is not the corporate successor of San Diego Marine Construction Company (SDMCC). However, a review of the facts confirms that the Regional Water Quality Control Board correctly identified S&C Boat as a discharger on this basis.

**I. BRIEF BACKGROUND**

Rather than start with the incorporation of S&C Boat, a correct perspective on the factual background requires an earlier start. Oakley J. Hall, Sr. (Hall Sr.) founded SDMCC in the early part of 1900 and ran the corporation until his death in 1967. SDMCC originally comprised three different divisions, a marine division, a boat division and an investment division. As S&C Boat acknowledges, the boat division was commonly known as "Star and Crescent Boat Company." In 1972, after Hall Sr.'s death, SDMCC sold the marine division to a subsidiary of Campbell Industries. SDMCC then changed its name to S&C Investment.

On April 7, 1976, S&C Boat incorporated. There is no evidence S&C Boat had any assets or stock of its own at that point. Two days later, S&C Boat held a special meeting at which the original directors of that company resigned and new directors took their place. The new directors each had close ties with S&C Investment and many were also directors of S&C

Investment. The new directors included Oakley Hall, Jr. (Hall Jr.), who had controlled SDMCC following his father's passing. At this same meeting, S&C Boat agreed to accept an offer by S&C Investment. Under the terms of this offer, S&C Boat accepted all assets and liabilities of S&C Investment's harbor excursion business in exchange for all of the stock of S&C Boat. Contrary to S&C Boat's repeated claim, there is no evidence in the record that S&C Investment held any other assets or was running any other businesses at the time it transferred the boat division assets and liabilities to S&C Boat. Rather, the earliest evidence of S&C Investment's other businesses is more than a year and a half after S&C Boat agreed to acquire the boat division. In 1991, S&C Investment dissolved.

S&C Boat's assertion that it is not the corporate successor of the boat division and SDMCC is untenable. For decades S&C Boat held itself out as the successor to these entities for marketing and business development purposes. By way of example, a 1994 S&C Boat proposal submitted to the Port asserts that S&C Boat's history is essentially Hall Sr.'s history "for the two are inseparably linked." (Exhibit A {Reference to alphabetic exhibits refer to the Port's exhibits attached to the Declaration of Scott E. Patterson in support of the Port's instant submittal and reference to numeric exhibits shall refer to S&C Boat's exhibits in support of its submittal.} [May 1, 1994 S&C Boat Response to Port Request for Proposals for Water Taxi Service], p. PORT011898 [emphasis added].) S&C Boat went on to state that Hall Sr. was its founder and driving force for over 50 years. (Ibid.) Similar references to this history and lineage can still be found to this day on S&C Boat's website. (Exhibit I [Website screen images].) Now, when the "inextricable link" does not serve its interests, S&C Boat disavows any connection.

## II. NUMEROUS GROUNDS FOR SUCCESSOR-IN-INTEREST LIABILITY EXIST

One who acquires the assets of a corporation also acquires the liabilities of that corporation in four different scenarios:

- (1) When there is an express or implied agreement of assumption of liability;
- (2) When the transaction amounts to consolidation or merger of the two corporations;
- (3) When the purchasing corporation is a mere continuation of the seller; or
- (4) When the transfer of assets to the purchaser is for the fraudulent purpose of escaping liability. (Ray v. Alad, (1977) 19 Cal. 3d 22, 28.)

The first scenario is met because S&C Boat assumed all liabilities at the time it acquired S&C Investment's assets. In addition, the facts support a finding that the second and third scenarios have also been satisfied as the transaction between S&C Investment and S&C Boat amounted to both a de facto merger and because S&C Boat was a "mere continuation" of SDMCC by way of S&C Investment.

### A. S&C Boat Assumed S&C Investment's Liabilities

Whether S&C Boat expressly or impliedly assumed liability for a portion of the Shipyard Sediment Site is a question of fact. (In the Matter of the Petition of Purex Industries, Inc., State Board Order No. WQ- 97-04, 1997 Cal. ENV. LEXIS 3, \*10.) A review of the offer that S&C Boat accepted S&C Boat illustrates that the parties intended to transfer all of S&C Investment's boat operation assets along with all of S&C Investment's boat operation liabilities. Specifically,

S&C Boat agreed to receive “all of [S&C Investment’s] right, title, and interest of every kind and description in and to its business and assets pertaining to its harbor excursion business,” “but subject to all liabilities of said business as of March 31, 1976, as relate to its harbor excursion business.” (Exhibit 17 [Minutes of Meeting of Board of Directors of S&C Boat dated April 9, 1976], p. S&C0050.)

S&C Boat contends that it did not agree to accept all liabilities because the offer referenced an exhibit that listed assets and liabilities of the harbor excursion business. However, nothing in the offer indicates S&C Investment was retaining any harbor excursion business assets or liabilities or that S&C Investment intended to retain any harbor excursion business assets or liabilities. Rather, as noted, the central agreement was that S&C Boat would take on “all liabilities of said business.”

Thus, when read in full context, the exhibit list served as nothing more than a list of the known harbor excursion business assets and liabilities, not a limitation on the intended scope of the transfer. Because S&C Investment was presumably unaware at the time of the liabilities at issue in this matter, the fact this liability was not included on the list is neither surprising nor material. It is not surprising because an unknown liability could not be specifically identified. (See *In the Matter of the Petition of Purex Industries, Inc.*, State Board Order No. WQ- 97-04, 1997 Cal. ENV. LEXIS 3, \*14.) It is not material because the express language of the offer makes clear the intent to transfer “all liabilities,” not just known liabilities. In short, the agreement contains no language that would support the conclusion that S&C Investment intended to transfer known liabilities and to retain unknown liabilities.

S&C Boat’s contention that S&C Investment “continued to own and operate its many other diverse assets, and continued to be responsible for the debts and liabilities associated therewith” finds no support in any evidence. (See, S&C Boat Written Submittal, p. 6.) S&C Boat cites as support S&C Investment minutes from December 1977 and later, more than a year and a half after the S&C Boat transaction. (*Id.*, at fn. 44; Exhibit 11.) Nothing in these minutes indicates S&C Investment was running any of the identified operations in April 1976 or earlier. Similarly, S&C Boat’s person most knowledgeable testified in deposition that he was unaware of any other S&C Investment assets in April 1976, apart from those being transferred to S&C Boat. (Exhibit J [Excerpts from Palermo Deposition].) In sum, the only known S&C Investment operations in April 1976 related to the sole remaining SDMCC operation – the boat division. S&C Boat is thus not entitled to a presumption that S&C Investment retained any assets or liabilities at that time.

#### B. Since S&C Boat Merged With S&C Investment it Assumed S&C Investment’s Liabilities

An entity may also be held liable for its predecessor’s liabilities if the transaction amounts to a consolidation or merger.

##### 1. All Requisite Factors Establishing De Facto Merger Can Be Established

Following *Ray*, the Court of Appeal in *Marks v. Minnesota Mining & Manufacturing Co.* (1986) 187 Cal.App.3d 1429, 1436, formulated the following inquiry for determining "whether a

transaction cast in the form of an asset sale actually achieves the same practical result as a merger" for the purposes of successor liability: "(1) was the consideration paid for the assets solely stock of the purchaser or its parent; (2) did the purchaser continue the same enterprise after the sale; (3) did the shareholders of the seller become shareholders of the purchaser; (4) did the seller liquidate; and (5) did the buyer assume the liabilities necessary to carry on the business of the seller?" (Ibid.) All of the factors set forth in Ray are present here.

First, it is undisputed that S&C Boat transferred all of its stock in exchange for S&C Investment's assets and liabilities. For this same reason, the third element is also met. Because S&C Investment owned all of S&C Boat's stock, the S&C Investment shareholders would have been the owners of all of S&C Boat's stock.

As to the second element, S&C Boat "continued the same enterprise" as S&C Investment after the transfer. In particular, S&C Boat operated the same harbor excursion business using the same Star & Crescent name with the same vessels from the same locations. Likewise, as to the fourth element, S&C Investment ceased the only known business operations that it had at the time. There is no evidence S&C Investment continued any boating operations at San Diego Bay immediately after the transfer. Further, contrary to S&C Boat's central claim, there is no evidence that S&C Investment was conducting any other operations in April 1976, as opposed to December 1977 or later. Thus, while S&C Investment did not actually liquidate immediately after the transaction, there is no evidence that it continued conducting any business after the transaction until at least December 1977.

Finally, as noted above, the fifth element is satisfied as S&C Boat "assumed the liabilities necessary to carry on the business of the seller." S&C Boat specifically assumed the liabilities necessary to operate the harbor excursion division. These liabilities included specific notes payable, employee advances, charter deposits and vacation and holiday pay.

## 2. Additional Evidence Establishes Merger

Any claim that S&C Boat and S&C Investment continued after the transaction as two clearly distinct operations is negated by review of S&C Investment's corporate documents and additional documents. In fact, for years after the transaction, S&C Investment continued to exert extensive control over S&C Boat finances and corporate decisions, as reflected in the following evidence:

- During an annual meeting of S&C Investment on December 23, 1977, S&C Investment agreed to increase the salaries and bonuses for S&C Boat as "required under the terms of the ... agreement" between S&C Investment and S&C Boat. (Exhibit 11 [Minutes from S&C Investment's Annual Meeting of Stockholders on December 23, 1977].)
- On June 8, 1979 S&C Investment again approved the schedule of dividends paid, bonuses and salaries to officers of S&C Boat. (Exhibit 13 [Minutes from S&C Investment's Board of Directors on June 8, 1979].)
- S&C Boat and S&C Investment purchased insurance together in 1979. (See Exhibit C [Minutes from S&C Boat's Board of Directors dated September 19, 1979 identifying "Marine Insurance for 1979-1980 is \$67,245.19, less Lake Mead Ferry Services (approximately \$8,000)."].) Lake

Mead Ferry Service was a S&C Investment subsidiary Nevada Corporation. (See Exhibit 14 [Minutes from S&C Investment Board of Directors Meeting on March 9, 1981].)

•On March 9, 1981, S&C Investment guaranteed repayment of a loan issued to S&C Boat. Exhibit 14 [Minutes from S&C Investment Board of Directors Meeting on March 9, 1981].) In that same meeting S&C Investment again agreed to the schedule of dividends paid, bonuses and salaries to S&C Boat's directors and also indicated it had no objection to S&C Boat's desire to dissolve its Sub-Chapter S status.

Likewise, other documents indicate that S&C Boat continued to hold itself out as part of S&C Investment. Specifically, a lease with the Port on February 4, 1977, almost one year after the asset transfer, identifies S&C Boat as "a division of Star and Crescent Investment Co." (Exhibit B.) Based on the foregoing, S&C Boat cannot persuasively argue that it was a new and distinct corporation, free from the historic liabilities of S&C Investment that existed at the time of the asset transfer in April 1976.

### S&C Boat Operated as a "Mere Continuation" of S&C Investment

Under California law, a corporation acquiring the assets of another corporation is the latter's "mere continuation" upon a showing that "(1) no adequate consideration was given for the predecessor corporation's assets and made available for meeting the claims of its unsecured creditors," or "(2) one or more persons were officers, directors, or stockholders of both corporations." (Ray, *supra*, 19 Cal. 3d at 29.) While either element would suffice for successor liability under a continuation theory, both factors can be readily established.

#### 1. Transfer of Stock and Later Payment for Repurchase of Stock Does Not Amount to Adequate Consideration

Mere continuation will be found when there is "insufficient consideration running from the new company to the old." (Maloney v. American Pharmaceutical Co., (1988) 207 Cal. App. 3d. 282.) Here, S&C Boat was not an ongoing company with its own value when it "purchased" S&C Investment's harbor excursion business. In essence, S&C Investment traded all of its documented assets in April 1976 to a company which otherwise had "no assets, no liabilities, [and] no equity capital." (Exhibit 17 [Minutes from S&C Boat's Board of Directors Meeting], p. S&C0047.) Stock in a company whose only assets are the assets it just received is not adequate consideration.

S&C Boat appears to implicitly concede this point, instead arguing that adequate consideration was given because S&C Investment later sold the stock that it received for \$765,400. However, this does not disprove the absence of adequate consideration for numerous reasons. First, this was a later transaction, not the transaction at the relevant point – April 1976 when S&C Investment divested itself of the assets. Second, this "sale" involved a promissory note, under which S&C Investment apparently agreed to relinquish the only consideration it received for its assets in exchange for a promise to be paid five years later. Third, S&C Investment sold the stock to the directors of S&C Boat, Stephen P. Carlstrom, Judy Hall and Janet Miles, who also were Hall, Jr.'s children and wife. (See Exhibit 22 [Shareholder certificates for S&C Boat dated October 26, 1976] and Exhibit K [Hall, Jr. Obituary].) In fact, Hall, Jr. had long before expressed to the Port his desire to transfer ownership of his harbor excursion business to his children. (Exhibit H [October 12, 1976 correspondence].)

As such, while the exact mechanisms of the transactions are somewhat blurry because of S&C Boat's failure to provide supporting documents, what can be determined is this. S&C Investment divested itself of all known assets in exchange for stock in a new company with no assets other than S&C Investment's assets. S&C Investment then later agreed, in essence, to front the price of the sale of this stock back to S&C Boat's leaders, who were the children and spouse of the man that had been controlling S&C Investment. This does not constitute adequate consideration.

## 2. There was a Commonality of Directors Between the Two Entities

Regardless of whether adequate consideration was paid, "mere continuation" successor liability can be found on the basis of the similarity of the companies' leadership at the point of the transaction. Contrary to S&C Boat's claims, S&C Boat and S&C Investment had far more than one person in common. Rather, at the April 9, 1976 meeting for S&C Boat, the following directors and officers were elected, Hall, Jr. (President), Leona Jackson (Secretary), Stephen P. Carlstrom (Vice President), Kenneth Beiriger (Vice President/Treasurer), Judy Hall, Janet Miles and Raleigh Miles. These officers of this newly formed corporation were virtually identical to the officers of S&C Investment at the time. In particular, the officers of S&C Investment in the 1970's were O.J. Hall, Jr. (President) K.N. Beiriger (Vice President) and Leona Jackson (Secretary). (See Exhibits E [Correspondence dated November 6, 1973 to the Port from S&C Investment, K.N. Beiriger, V.P.], F [Correspondence dated January 14, 1975 to the Port from S&C Investment, Hall, Jr. President], and G [April 9, 1976 signed offer from S&C Investments, O.J. Hall, Jr. President and Leona Jackson, Secretary].)

S&C Boat also erroneously contends that there was no commonality of shareholders. However, S&C Boat has provided no evidence of who the shareholders were at this point in time and offers no explanation as to why its unsupported claims on this point should be credited. Regardless, as noted above, immediately after the transaction, the shareholders of S&C Boat were the same shareholders of S&C Investment because S&C Investment owned all of the S&C Boat stock. Thus, there was a high level of commonality between S&C Boat's directors and shareholders and S&C Investment's directors and shareholders.

## III. SAN DIEGO WATER BOARD SHOULD ALSO NAME S&C INVESTMENT AS A DISCHARGER

The San Diego Water Board should also consider naming SDMCC, Star and Crescent Boat Company, a division of SDMCC, S&C Investment and Star and Crescent Ferry Company as dischargers in addition to S&C Boat. (See State Water Board Order Nos. WQ 86-16 ("Multiple parties should properly be named in cases of disputed liability."); and WQ-89-14 (A dissolved corporation may be named in a Cleanup and Abatement Order).

## IV. CONCLUSION

The evidence produced thus far presents a serious question as to whether these S&C Investment and S&C Boat maintained separate identities. In fact as established and admitted by S&C Boat, the two entities are "inseparably linked." San Diego Water Board's basis for assigning liability to S&C Boat has merit and it should not hesitate in continuing to name S&C

Boat as a discharger. Thus, S&C Boat's requests for revising the TCAO to remove S&C Boat as a responsible party and rescinding any designation as a "discharger" should be denied.

**Comment ID:** 291

**Organization:** NASSCO

**DTR Section:** 31, 32

**Comment:**

EHC/Coastkeeper Comment No. 1: The law requires cleanup to background except where evidence in the record demonstrates that alternative cleanup levels greater than background water quality are appropriate.

The Porter-Cologne Act establishes the framework pursuant to which the San Diego Regional Water Quality Control Board ("Regional Board") may reasonably protect water quality in California. Cal. Water Code §§ 13000 et seq. To the extent EHC/Coastkeeper suggest that the Water Code sets forth a rebuttable presumption of cleanup to background in all cases, EHC/Coastkeeper misstate the law.

I. The Water Code Recognizes That Beneficial Uses Are Not Unreasonably Affected By All Changes To Chemical Concentrations In Sediments

A. The Water Code Allows Dischargers To Clean Up Or Abate The Effects Of Wastes

EHC/Coastkeeper misstates the applicable legal standard to the extent that they suggest the California Water Code sets forth a rebuttable presumption of cleanup to background in all cases. Rather, the California Water Code Section 13304 requires a discharger to "clean up or abate the effects of the waste . . ." (emphasis added). Although the statute is often misquoted by using the conjunctive "and" in place of the disjunctive "or" (for example, when referring to a "cleanup and abatement order"), the legislature's deliberate use of the disjunctive word "or" in the statute makes clear that wastes need not be cleaned up if the effects can be abated. Accordingly, the plain language of Section 13304 supports the conclusion that a cleanup under Section 13304 can be based on abating the effects of the waste, without remediating to background chemical levels.

In fact, the express language of the statute indicates that cleanup levels above background are acceptable if the sediment does not unreasonably affect beneficial uses, and therefore fails to constitute either "pollution" or a "nuisance." Specifically, the Regional Board's jurisdiction under Section 13304 is triggered where a discharge "creates, or threatens to create, a condition of pollution or nuisance," and it is on this basis that the Regional Board has issued the instant Tentative Cleanup And Abatement Order No. R9-2011-0001 ("TCAO"). Cal. Wat. Code § 13304; TCAO, at ¶ 1 (alleging conditions of contamination and nuisance that adversely affect aquatic-life, aquatic-dependent wildlife, and human health beneficial uses). As discussed in NASSCO's Comment Nos. 10 and 11 (NASSCO's Comments on the San Diego Regional Water Quality Control Board Cleanup Team's September 15, 2010 Tentative Cleanup and Abatement Order No. R9-2011-0001, Draft Technical Report, and Shipyard Administrative Record, May 26, 2011, "NASSCO's Initial Comments"), the Water Code recognizes that beneficial uses are not unreasonably impaired by all changes to chemical concentrations in sediments, and that certain

concentrations may be above background conditions, yet not constitute a state of “pollution” or “nuisance.”

#### B. The Water Code Implicitly Recognizes That Industrial Discharges Are Permissible As Long As They Do Not Unreasonably Impair Other Beneficial Uses

The California Water Code also implicitly recognizes that industrial uses, including industrial discharges, are acceptable uses of water bodies as long as discharges from those facilities do not unreasonably impair other beneficial uses. If this were not so, permits for the discharge of any wastewater would be denied since there is at least some impact on waters associated with any discharge. Interpreting the statute to require cleanup to background sediment chemistry regardless of the effect of the contaminants on beneficial uses ignores these realities, reads the word “unreasonably” out of the definition of pollution, and effectively imposes a “zero discharge” requirement on all industrial dischargers—an obviously unreasonable result. (“Pollution” means an “alteration of the quality of the water of the state by waste to a degree which unreasonably affects . . . beneficial uses”). Cal. Wat. Code § 13050(1) (emphasis added). {Notably, other Regional Boards have not invoked State Water Board Resolution No. 92-49 (“Resolution 92-49”) to require that sediment must be cleaned to background. See San Diego Regional Board Order Nos. 88-86, 88-78, 89-31, 94-100, 94-101, 94-102, 95-21, 97-63, 99-06, 2001-303, R9-2002-72. See also In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, State Water Resources Control Board, September 17, 1992 (“Paco Terminals”). Instead, the Regional Board calibrated cleanup levels to be protective of beneficial uses, regardless of whether that level was at background concentrations or above.} Similarly, the legislative history of the Porter-Cologne Act confirms that the Regional Boards must balance economic and water quality interests, and that, although “waste disposal and assimilation are not included in the definition of beneficial uses, . . . they are recognized as part of the necessary facts of life, to be evaluated and subject to reasonable consideration and action by regional boards.” See Recommended Changes in Water Quality Control, Final Report of the Study Panel to the California State Water Quality Control Board, Prepared for the California Legislature, March 1969, at Appendix A, at 21. See also, *id.* at 7 (requiring balancing of interests); *id.* at Appendix A at 26 (“[I]t would be very confusing to refer to waste disposal, dispersion and assimilation as any kind of beneficial uses of water. However, this omission is not intended to question the obvious facts that ultimately the residual substances remaining after treatment of wastes must, in most instances, reach waters of the state, and economic benefits to a waste discharger . . . relate inversely to the cost of treatment. These economic values are recognized in paragraph 2 of Section 13000.”).

#### C. The Water Code Mandates That Regional Boards Use The Most Cost-Effective Methods For Cleaning Up Or Abating The Effects Of Contamination Or Pollution

Finally, California Water Code Section 13307, which authorizes the California State Water Quality Control Board (“State Board”) to adopt policies for Regional Boards to follow in the oversight of cleanup and abatement activities, mandates that the State Board’s policies “shall include . . . [p]rocedures for identifying and utilizing the most cost-effective methods . . . for cleaning up or abating the effects of contamination or pollution.” Cal. Wat. Code § 13307(a)(3). Thus, taken together, California Water Code Sections 13304 and 13307 allow for the abatement



of the effects of past discharges on water quality in the most cost-effective manner. Rather, the key inquiry is whether beneficial uses at the Site are unreasonably affected by the elevated sediment chemistry observed at the Site and/or whether site conditions (1) are injurious to health, indecent or offensive to the senses, or obstructs the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) affect at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) occur during, or as the result of, the treatment or disposal of wastes. Cal Wat. Code §§ 13050(1)-(m). As discussed extensively in NASSCO's Initial Comments, Site sediments do not pose any unacceptable risk to aquatic life, aquatic-dependent wildlife, or human health, and do not unreasonably affect beneficial uses.

## II. The Regional Board Must Consider The Totality Of Factors Affecting Water Quality In Selecting The Cleanup Levels Under Resolution 92-49, Including Economic And Technological Feasibility

As discussed below, the Regional Board must consider the totality of factors affecting water quality in selecting alternative cleanup levels under State Water Resources Control Board Resolution 92-49 ("Resolution 92-49").

### A. Resolution 92-49 Requires Alternative Cleanup Levels To Be Protective Of Beneficial Uses, But Grants The Regional Board Substantial Discretion In Determining Alternative Cleanup Levels

To the extent that the Regional Board finds—despite substantial evidence to the contrary—that site conditions do create a condition of pollution or nuisance, the plain terms of Resolution 92-49 do not require cleanup to background unless it is both technologically and economically feasible (i.e., cost-effective) to do so. Specifically, Resolution 92-49 provides that the Regional Board “shall . . . ensure that discharges are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. . . .”

The State Board has described the analysis required by Resolution 92-49 as follows:

Resolution 92-49 directs the RWQCBs to ensure that water affected by an unauthorized release attains either background water quality or the best water quality which is reasonable if background water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved,, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background . . . any such cleanup level shall (1) be consistent with the maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less stringent than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

Resolution 92-49, at III.G. See also, In the Matter of the Petition of Unocal Corporation, State Board Order No. WQ 98-12, at 2 (quoting Resolution 92-49); In the Matter of the Petition of Landis Incorporated, State board Order No. WQ 98-13, at 2 (same); In the Matter of the Petition of Unocal Corporation, Order No. 99-10, at 2; In the Matter of the Petition of Chevron Pipe Line

Company, State Board Order No. WQ 2002-0002; In the Matter of the Petition of Environmental Health Coalition and Eugene Sprofera, Order No. WQ 92-09, at 4.

Further, the text of Resolution 92-49 requires an analysis of cost-effectiveness and technological and economic feasibility in determining cleanup levels. See Resolution 92-49, at 6-7 (“The Regional Water Board shall . . . ensure that dischargers shall have the opportunity to select cost-effective methods for . . . cleaning up or abating the effects [of wastes discharged and] . . . require the discharger to consider the effectiveness, feasibility, and relative costs of applicable alternative methods for investigation, cleanup and abatement.”) (emphasis added).

#### B. There Is Substantial Evidence In The Record That Cleanup To Background Is Infeasible, Beneficial Uses At The Site Are Not Impaired, And Monitored Natural Attenuation Will Achieve Cleanup Goals

As discussed in NASSCO’s Initial Comments, active remediation is not economically or technologically feasible within the meaning of Resolution 92-49; rather, monitored natural attenuation is the appropriate remedial alternative considering the demands being made and to be made on the waters at the Site, and the total values involved—beneficial and detrimental, economic and social, and tangible and intangible. To the extent the regulatory scheme requires cleanup to background unless economically and technologically infeasible, there exists substantial evidence in the record demonstrating that (1) beneficial uses at the site are not impaired, (2) monitored natural attenuation will achieve the cleanup goals articulated in the TCAO in the most cost-effective manner, and (3) cleanup to background is not feasible, both economically and technologically.

#### III. EHC/Coastkeeper Misstates The Requirements Of Resolution 92-49

Citing Resolution 92-49, EHC/Coastkeeper argues that Section 2550.4 of the California Code of Regulations requires that cleanup levels must be set to background water quality, unless the Regional Board analyzes economic and technological feasibility on a pollutant-by-pollutant basis, and determines that cleanup to background is either economically or technologically infeasible on a pollutant-by-pollutant basis. Tellingly, Resolution 92-49 has been in existence for decades; yet, no Regional Board, State Board, or court appears to have ever interpreted it in the manner EHC/Coastkeeper now suggest.

This is because, under Resolution 92-29, the Regional Board “may prescribe an alternative cleanup level less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible – as long as the less stringent cleanup level is protective of beneficial uses.” Draft Technical Report (“DTR”), at 32-3. Additionally, the State Board grants substantial discretion to Regional Boards in setting alternative cleanup levels under Resolution 92-49. In sum, Resolution 92-49 is intended to ensure that any alternative cleanup levels are protective, and that cleanups are cost-effective. Requiring constituent-by-constituent economic and technological feasibility analyses would make no sense considering the practicalities of sediment cleanup, and would be contrary to the Regional Board’s obligation to take into account “the resources, both financial and technical, available to the person[s] responsible for the discharge” in overseeing investigations and cleanups under Resolution 92-49..

A. Section 2550.4 Does Not Require Alternative Cleanup Levels, or Economic And Technological Feasibility Analyses To Be Conducted On A Constituent-By-Constituent Bases

Citing Resolution 92-49, EHC/Coastkeeper argues that Section 2550.4 of the California Code of Regulations governs the setting of alternative cleanup levels for the Site, and requires the Regional Board to select concentration limits for each constituent subject to remediation. Resolution 92-49, at III.G. (“[I]n approving any alternative cleanup levels less stringent than background, apply Section 2550.4 of Chapter 15 . . . ; any such alternative cleanup level shall: (1) be consistent with maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.”). As discussed below, Section 2550.4 does not operate to require constituent-by-constituent analysis in this cleanup.

1. Chapter 15 Was Not Designed As General Guidance For Sediment Remediation, And Is Only Applicable To The Extent “Feasible” According To The Plain Terms Of Resolution 92-49

Chapter 15, including Section 2550.4, was not designed as general guidance for sediment remediation; rather it sets forth detailed siting, construction, monitoring, and closure requirements for existing and new waste treatment, storage, and disposal facilities. Thus, Chapter 15 provides technical criteria for establishing water quality protection standards, monitoring programs, and corrective action programs for releases from waste management units, much of which is inapplicable to sediment remediation.

The explicit terms of Resolution 92-49 also provides that “discharges subject to [Water Code] Section 13304 may include discharges of waste to land; such discharges may cause, or threaten to cause, conditions of soil or water pollution or nuisance that are analogous to conditions associated with migration of waste or fluid from a waste management unit.” In such cases, Resolution 92-49 provides that the Regional Board should implement the provisions of Chapter 15, only to the extent applicable to cleanup and abatement, as follows:

(a) If cleanup and abatement involves corrective action at a waste management unit regulated by waste discharge requirements issued under Chapter 15 the Regional Water Board shall implement the provisions of that chapter;

(b) If cleanup and abatement involves removal of waste from the immediate place of release and discharge of the waste to land for treatment, storage or disposal, the Regional Water Board shall regulate the discharge of the waste through waste discharge requirements issued under Chapter 15, provided that the Regional Water Board may waive waste discharge requirements under WC Section 13269 if the waiver is not against the public interest (e.g if the discharge is for short-term treatment or storage, and if the temporary waste management unit is equipped with features that will ensure full and complete containment of the waste for the treatment or storage period); and

(c) If cleanup and abatement involves actions other than removal of the waste, such as containment of waste in soil or ground water by physical or hydrological barriers to migration (natural or engineered), or in-situ treatment (e.g. chemical or thermal fixation or bioremediation), the Regional Water Board shall apply the applicable provisions of Chapter 15 to the extent that it is technologically and economically feasible to do so.

Resolution 92-49, at III.F.

However, because Chapter 15 was developed to address releases from hazardous waste management units, not to articulate goals for the remediation of sediment, the State Board recognizes that Chapter 15 applies to cleanups only to the extent “feasible.”

Here, there is no basis for analogizing the Site to a waste management unit, particularly since the site sediments were found not pose risks to aquatic, aquatic-dependent wildlife, or human health beneficial uses in an extensive and unparalleled sediment investigation, conducted with substantial oversight from the Regional Board. Moreover, cleanup and abatement actions are explicitly exempted from the provisions of Section 2550.4, provided that “remedial actions intended to contain such wastes at the place of release shall implement applicable provisions of [Chapter 15] to the extent feasible.” 23 Cal. Code Regs. §2511.

Additionally, Chapter 15 also provides that “alternatives to construction or prescriptive standards contained in this chapter may be considered. Alternatives shall . . . be approved where the discharger demonstrates that (1) the construction or prescriptive standard is not feasible as provided in subsection (c) of this section, and (2) there is a specific engineered alternative that (A) is consistent with the performance goal addressed by the particular construction or prescriptive standard; and (B) affords equivalent protection against water quality impairment.”). In fact, Chapter 15 itself provides that it is not feasible to comply with a prescriptive standard in Chapter 15 if it “(1) is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives which meet the criteria [described above]; or (2) is impractical and will not promote the attainment of applicable performance standards. Regional Boards shall consider all relevant technical and economic factors including, but not limited to, present and projected costs of compliance . . .” 23 Cal. Code Regs. §2510.

Application of Chapter 15, including the requirements of Section 2550.4, in the manner EHC/Coastkeeper suggests is clearly not “feasible.” *Id.*; 23 CCR § 2511; Resolution 92-29, at III.F. First, it is impractical to conduct distinct analyses of alternative cleanup levels for each individual pollutant where substantial evidence demonstrates that secondary pollutants are co-located with primary pollutants and will be remediated to protective levels in a common footprint. Similarly, conducting economic and technological feasibility analyses on a pollutant-by-pollutant basis is economically infeasible, and nonsensical given the engineering realities of dredging.

## 2. The Regional Boards Have Substantial Discretion To Select Alternative Cleanup Levels, Provided That They Are Protective

As discussed above, Section 2550.4 relates to waste discharge and monitoring requirements for hazardous waste management units, and in-situ containment of wastes, to the extent “feasible”; however, even to the extent that the Regional Board must apply these requirements in approving alternative cleanup levels, the applicable requirements pertain, at best, to water quality

monitoring with respect to in situ remediation of waste discharges. As discussed above, Section 2550.4 addresses concentration limits in the context of waste discharge and monitoring requirements, and is intended only to ensure that alternative cleanup levels set above background levels are adequately protective. This understanding is confirmed by State Water Resources Control Board guidance, which states that

Resolution 92-49 is flexible and permits a regional board to set alternative cleanup levels less stringent than background concentrations if attainment of background concentrations is infeasible. Any such alternative cleanup level may not unreasonably affect beneficial uses and must comply with all applicable Water Quality Control Plans and Policies. The Resolution allows for consideration of adverse impacts of any cleanup itself as well as natural attenuation if cleanup goals can be met in a reasonable time.

State Water Resources Control Board Memorandum From Craig Wilson To John Robertus (February 22, 2002), at SAR097571- 81) (“Wilson Memo”). Notably, although the Wilson Memo references Section 2550.4, it makes no direct mention of any requirement to set alternative cleanup levels, or analyze economic or technological feasibility, on a constituent-by-constituent basis. *Id.* In fact, it provides that the Regional Board has “substantial” discretion in setting alternative cleanup levels, and notes that Resolution 92-49 requires alternative cleanup levels less stringent than background to “be consistent with maximum benefit to people of the state” and requires consideration of “all demands being made and to be made on the waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Wilson Memo, at SAR097579. Further, this determination is to be “made on a case-by-case basis, and is based on considerations of reasonableness under the circumstances at the site.” *Id.* Thus, to the extent that Section 2550.4 is applicable to the cleanup and abatement of sediment contamination, EHC/Coastkeeper clearly misinterprets Section 2550.4 as requiring alternative cleanup levels (and the concomitant economic and technological feasibility analyses) to be conducted on a pollutant by pollutant basis.

Rather, Section 2550.4 addresses concentration limits in the context of waste discharge and monitoring requirements, and is intended only to ensure that alternative cleanup levels set above background levels are adequately protective. That is, to the extent applicable to cleanup levels, Section 2550.4 simply requires the Regional Board to (1) set alternative cleanup levels at the lowest level that are economically and technologically feasible, and (2) ensure that concentrations of contaminants at such levels “do not pose a substantial present or potential hazard to human health or the environment” (i.e., ensures that the cleanup level is protective of beneficial uses). Here, the Regional Board has set excessively conservative cleanup levels that are protective of human health and the environment, which, if anything, will require the parties to expend much more than is economically feasible, at considerable expense to the parties named on the TCAO. See, e.g., NASSCO and Southwest Marine Detailed Sediment Investigation, Exponent (October 2003) (“Exponent Report”), at 19-13; Deposition of David Barker (“Barker Depo”), at 204:21 – 206:6.

Additionally, in selecting the alternative cleanup levels, the Regional Board has expressly considered the applicable requirements of Resolution 92-49 and California Code of Regulations Section 2550.4. TCAO, at ¶ 32; DTR, at 32-1 – 32-2. In doing so, the Regional Board set alternative levels on a constituent-specific basis for both primary COCs and secondary COCs. Primary COCs are those associated with the greatest exceedance of background, and the highest magnitude of potential risk at the Site. Cleanup levels for primary COCs, were set using the

post-remedial SWAC as a concentration limit. TCAO, at ¶ 32. Secondary COCs, which are associated with lower exceedances of background, were also extensively and individually evaluated, and were found to be highly correlated with Primary COCs and thus adequately addressed in the common footprint. The Regional Board also assessed risk to wildlife receptors under projected post-remedial conditions, and confirmed that the alternative cleanup levels adequately protect aquatic-dependent wildlife and human health beneficial uses. DTR, at § 32. By contrast, EHC/Coastkeeper has provided no credible evidence that concentrations below the proposed alternative cleanup levels, but above background, pose “substantial present or potential hazard to human health or the environment.”

### 3. EHC/Coastkeeper Has Cited No Precedent Supporting Its Novel Interpretation Of Resolution 92-49

Finally, we are aware of no cleanups where the Regional Board has required separate alternative cleanup level or feasibility analyses for each and every constituent involved, particularly where distinct constituents are correlated, as here. Nor has EHC/Coastkeeper pointed to any State Board or court decisions supporting its novel interpretation of Resolution 92-49.

## IV. Conclusion

For the foregoing reasons, Resolution 92-49 does not require constituent-by-constituent analysis of alternative cleanup levels, or economic or technological feasibility, and EHC/Coastkeeper’s comment is without merit.

[NASSCO Comment No. 262, TCAO, at ¶¶ 31, 32, DTR, at §§ 31, 32]

**Comment ID:** 294

**Organization:** NASSCO

**DTR Section:** 31, Appendix 31

**Comment:**

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EHC/Coastkeeper Comment No. 4: The Regional Board’s findings must be supported by evidence in the record.

### I. Assessment Of Impacts To Beneficial Uses And Economic Feasibility Analysis Under Resolution No. 92-49 Support Monitored Natural Attenuation As The Appropriate Remedy

EHC/Coastkeeper correctly notes that an agency’s findings must be supported by the weight of the evidence in the record. EHC/Coastkeeper Comments, at 3. However, EHC/Coastkeeper’s specific contentions that the alternative cleanup levels set by the Regional Board are insufficiently protective, and the corresponding implication that cleanup to background is technologically and economically feasible, are without merit.

In fact, considering that the results of the sediment investigation showed that “aquatic life, aquatic-dependent wildlife, and human health beneficial uses are at approximately 95 percent of ideal conditions, and active remedial alternatives will result in improvements that are minimal—on the order of only a percent or so”—any active remediation, including cleanup to background, is economically infeasible. Additionally, there is evidence in the record that cleanup to background is technologically infeasible. Barker Depo, at 246:11 – 248:3 (describing dredging of the volume of sediments required to reach background levels as “an expensive challenge” and

noting that “the board has not had regulatory experience with dealing with that volume of material . . .”).} Exponent Report, at 19-13; Barker Depo, at 204:21 – 206:6 (“Q: So, solely for [the economic feasibility] step of the equation, if you have a negligible – negligible benefit on one side, I assume that there – anything more than a negligible cost would mean it’s not economically feasible. A. Right. . . . Q. If there’s absolutely no benefit of an incremental reduction in cleanup, then there’s no cost that would justify that, correct? . . . A: That type of scenario would – could support an alternative cleanup level to background. I don’t know if that’s what you’re asking. But that is a point where the board could make a decision that no further cleanup could be required.”). [NASSCO Comment No. 265, TCAO, at ¶¶ 30, 31, 32, DTR, at §§ 30, 31, 32, Appendices 31, 32]

## II. EHC/Coastkeeper’s Contention That Additional Cleanup, Beyond The TCAO Footprint, Is Economically Feasible Is Without Merit

Resolution 92-49 defines the term “economic feasibility” as follows:

Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions. The evaluation of economic feasibility will include consideration of current, planned, or future land use, social, and economic impacts to the surrounding community including property owners other than the discharger. Economic feasibility, in this Policy, does not refer to the discharger’s ability to finance the cleanup. Availability of financial resources should be considered in the establishment of reasonable compliance schedules.

Resolution 92-49, at III.H.1.b. Additionally, as discussed in the DTR, analyzing economic feasibility involves “estimating the costs to remediate constituents of concern at a site to background and the costs of implementing other alternative remedial levels. An economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits.” DTR, at 31-1.

### A. The Record Is Clear That Cleanup To Background Is Economically Infeasible

EHC/Coastkeeper erroneously states that the record does not support a finding that cleanup to background is economically infeasible. Under Resolution 92-49, determining economic feasibility requires an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions. Further, Resolution 92-49 explicitly provides that “[e]conomic feasibility . . . does not refer to the discharger’s ability to finance cleanup;” rather, an economically feasible cleanup level is one where the incremental cost of further reductions in primary COCs outweighs the incremental benefits. Resolution 92-49, at III.H.

The DTR analysis compared incremental benefits of further cleanup, expressed in terms of exposure reduction to target receptors, with the incremental cost of achieving those benefits, and determined that the degree of exposure reduction does not justify the incremental cost of such reductions, beyond approximately \$33 million. DTR, at 31-2 - 31-3. This analysis is consistent with the requirements of Resolution 92-49, and is supported by evidence in the record. DTR, at § 31, Appendix 31. Moreover, as discussed above, due to the generally favorable site conditions,

any active remediation is economically infeasible under the terms set forth in Resolution 92-49. Exponent Report, at 19-13. In fact, it is well-known that cleanup of sediment to background levels in San Diego Bay is economically infeasible: to date, because of economic infeasibility, none of the sediment site in San Diego Bay have been remediated to background conditions. Cleanup Team's Responses and Objections To Designated Party BAE's First Set Of Requests for Admission, Admission Nos. 44 – 46 (admitting that it is economically and technologically infeasible to remediate the Site to background, and that the Regional Board has never required remediation to background sediment quality levels for any other site within the San Diego Bay).

The record contains no evidence that cleanup to background is economically feasible; in fact, EHC/Coastkeeper has not even provided evidence that cleanup to the alternative cleanup levels is economically feasible, let alone evidence supporting its position that cleanup to background levels is feasible. [NASSCO Comment No. 266, TCAO, at ¶ 31, DTR, at § 31, Appendix 31]

#### B. No Other Sediment Sites In San Diego Bay Have Been Remediated To Background

Moreover, EHC/Coastkeeper cannot point to a single sediment site in San Diego Bay that has been remediated to background levels; rather the consensus is clear, and the Regional Board's Sediment Site Cleanup Team ("Cleanup Team") admits, that cleanup to background is technologically and economically infeasible. See, e.g., Cleanup Team's Responses and Objections To Designated Party NASSCO's Second Set of Requests For Admissions, at RFAs 18- 21 (admitting that it is economically and technologically infeasible to require remediation to background sediment quality levels (as defined by Resolution 92-49), and admitting that the

Regional Board has never required remediation to background sediment quality levels at any other site in San Diego Bay).

[NASSCO Comment No. 267, CAO at ¶¶ 31, 32, DTR, at §§ 31, 32, Appendices 31, 32]

#### C. The Alternative Cleanup Levels Were Selected Based On An Overly Conservative Interpretation Of Chemistry And Biological Data, Not Economic Feasibility

EHC/Coastkeeper erroneously states that the economic feasibility analysis was the primary basis for the selection of the alternative cleanup levels; however, this is a patently false statement. The selection of alternative cleanup levels was based on the Regional Board's analyses of many factors, including ), including individual station and Sitewide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility. Further, based on these criteria, the selected cleanup levels are excessively conservative, as discussed extensively in NASSCO's Initial Comments.

Thus, contrary to EHC/Coastkeeper's assertions, the economic feasibility analysis was not intended to select a specific remedial scenario, and was not the primary basis for selection of any specific scenario. Rather, the analysis was intended to determine whether a point of diminishing returns on invested resources was apparent in the cost-benefit relationship, and then identify the most cost-effective level of effort—assuming that areas of higher contamination were preferentially selected for removal (as is typical). Accordingly, EHC/Coastkeeper's statement that "the economic feasibility analysis drives the entire cleanup" is incorrect. In actuality, the



final selection of a remedial footprint in the DTR was based on simultaneous consideration of many factors (as is legally required under Resolution 92-49), including individual station and Sitewide chemistry data, biological data (i.e., toxicity tests, benthic community analysis, SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility. In fact, considering the results of these analyses, the proposed cleanup is extremely conservative, as discussed in NASSCO's Initial Comments. [NASSCO Comment No. 268, CAO at ¶¶ 31, 32, 33, DTR, at §§ 31, 32, 33, Appendices 31, 32, 33]

EHC/Coastkeeper's assertion that "the economic feasibility analysis in Section 31 determined the alternative cleanup levels" is a mischaracterization of the analysis in the DTR, which contains highly conservative analyses of individual station and Sitewide chemistry data, biological data (including toxicity tests, benthic community analysis, and SPI data), technical feasibility, and specific beneficial use objectives, in addition to economic feasibility.

#### D. The DTR Conservatively Estimated The Costs Of Cleanup To Alternative Cleanup Levels

The DTR states that criteria including "total cost, volume of sediment dredged, exposure pathways of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife, and human health), effects on the shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources." DTR, at 31-1. EHC/Coastkeeper suggests that "benefits to human health, wildlife, aquatic-dependent wildlife, and other beneficial uses from removing pollutants" were not "quantified"; however, the economic feasibility analysis does quantify benefits in terms of exposure reduction. Further, using reasonable assumptions, such a quantification would not justify any active remediation. Extensive scientific investigation conducted at the shipyards, including the sediment quality investigation upon which the findings and conclusions of the TCAO are purportedly based, indicates that beneficial uses at the site are not unreasonably impaired and that active remediation would "result in improvements that are minimal—on the order of only a percent or so." Exponent Report, at 19-13. [NASSCO Comment No. 269, CAO at ¶¶ 31, 32, DTR, at §§ 31, 32, Appendices 31, 32]

Yet, active remediation, including the remediation described in the TCAO, would destroy existing mature and thriving benthic communities at the Site, and result in significant negative impacts to NASSCO and the surrounding community, including but not limited to (1) the potential to jeopardize the integrity of slopes and structures at the leasehold, (2) disruption of vital ship repair and construction activities that could result in delays or contractual breaches with the U.S. Navy and other customers, (3) increased truck traffic, (4) diesel emissions from trucks and heavy equipment, (5) noise, (6) accident risks, (7) transportation of large volumes of contaminated sediment through neighborhoods, and (8) the need to establish large staging areas for dewatering activities. Exponent Report, at §§ 18.2, 18.4; Barker Depo, at 306:22 – 307:21. Taking all of these factors into account suggests that the alternate cleanup levels are not economically feasible, and certainly do not weigh in favor of further cleanup. [NASSCO Comment No. 270, CAO at ¶¶ 31, 32, DTR, at §§ 31, 32, Appendices 31, 32]

E. Cleanup Levels Below The Proposed Alternative Cleanup Levels Are Not Justified Given The Favorable Site Conditions, And Are Economically Infeasible Regardless Of Whether The Eleven Cost Scenarios Are Analyzed Independently, Or In Groups Of Six

As discussed in NASSCO's Initial Comments, the alternative cleanup levels are overly conservative, based on a series of excessively cautious assumptions concerning potential impacts to aquatic life, aquatic-dependent wildlife, and human health. The proposed economic feasibility analysis is similarly overly conservative, and requires cleanup well beyond the point at which the incremental benefits are justified by the incremental costs of further cleanup, considering that it has been demonstrated that monitored natural attenuation will ensure that the (excessively conservative) alternative cleanup levels are met within a reasonable time. Thus, any cleanup beyond the point identified in the DTR is similarly economically infeasible, given the favorable conditions observed at the Site. This is so regardless of whether cleanup scenarios are assessed independently, or in groups of six, as discussed below.

The economic feasibility analysis was a theoretical exercise designed for a single purpose – to provide an incremental cost-benefit analysis for the full spectrum of cleanup possible at the Shipyard Site, including cleanup to background conditions. Eleven scenarios were evaluated based upon the Cleanup Team's best professional judgment that eleven data points would be sufficient to establish a cost-benefit relationship. Additionally, the analysis required that each scenario represent a comparable incremental increase in the level of remedial effort necessary; thus, because 11 divides evenly into 66 (whereas 10 or 12 or 15 does not), using 11 data points facilitated assurance that each scenario represented a comparable incremental increase in level of effort. As described in the DTR, the Regional Board ordered all 66 polygons according to their composite SWAC ranking, which it determined was the best single metric for comparing relative Chemicals of Concern ("COC") levels. {As described in the DTR, the sediment chemistry data used to calculate SWAC values for the economic feasibility analysis were the same data set used to assess all aspects of risk and beneficial use impairment at the Shipyard Site. Contrary to EHC/Coastkeeper's assertions, there are no "pollution reduction assumptions," other than the assumption that remediation areas under all scenarios will eventually equilibrate to background COC concentrations. Exposure reduction, as defined in the DTR, is simply the reduction in Sitewide SWAC that results from complete remediation of any specified area. It is an objective value, calculated mathematically from sediment chemistry data alone, and is not dependent on any given exposure scenario or assumptions. The exposure scenario evaluated in both the human and aquatic-dependent wildlife risk assessments in the DTR are generally proportional to the Sitewide SWAC, therefore SWAC reduction is an appropriate metric for general conclusions about reduction of exposure and risk to human and wildlife receptors.}. Each scenario was defined to be incrementally larger than the previous scenario by six polygons. Scenario 1 included the six most contaminated polygons (based on composite SWAC ranking), Scenario 2 included the 12 most contaminated polygons, Scenario 3 the 18 most contaminated polygons, etc. Scenario 11 included the entire Shipyard Site (66 polygons). This "worst first" approach provides a rational and direct manner in which to assess incremental net benefits of the full spectrum of potential cleanup effort. [NASSCO Comment No. 271, CAO at ¶ 31, DTR, at ¶ 31, Appendix 31]

Resolution 92-49 requires economic feasibility to be considered in setting appropriate cleanup levels, and requires the Regional Board to use best professional judgment in evaluating the point at which the incremental benefits of further cleanup are no longer justified by the incremental

costs. Thus, selection of the point at which incremental benefits no longer justify incremental costs is primarily a policy decision, requiring best professional judgment, not a simple mathematical determination.

Here, however, regardless of whether the 11 hypothetical cost scenarios are grouped into five ranges or presented as 11 independent calculations, the underlying cost-benefit relationship is the same. In fact, EHC/Coastkeeper's Figure 1, which depicts the eleven cost scenarios graphed individually, illustrates the same trend that is apparent in DTR Figure 31-1, and lends credence to Regional Board's determination that cleanup to background is economically infeasible. Specifically, under both scenarios, the benefit per dollar spent is relatively high and flat for the first three scenarios, but decreases dramatically with the additional cleanup associated with scenario 4 (i.e., above \$33 million total cost), suggesting that cleanup above \$33 million total cost is not economically feasible, given the minimal incremental benefits. In fact, cleanup beyond the economically feasible point as defined in the DTR results in an exposure reduction of less than 7 percent per \$10 million spent after \$33 million; less than 4 percent after \$45 million; and zero at \$185 million. DTR, at 32-40. Exposure reductions of merely a few percentage points do not justify the expenditure of tens of millions of dollars, and would clearly violate Resolution 92-49's economic feasibility provisions. [NASSCO Comment No. 272, CAO at ¶ 31, DTR, at § 31, Appendix 31]

Moreover, the Cleanup Team's analysis is based on chemical concentrations only. If the best measure of water quality is used (i.e., direct measurements of toxicity and benthic community analyses at NASSCO), then there is no incremental benefit of dredging any areas at NASSCO; thus, the economically feasible remedy is natural attenuation. [NASSCO Comment No. 273, CAO at ¶ 31, DTR, at § 31, Appendix 31]

### III. EHC/Coastkeeper's Proposed Constituent-By-Constituent Economic Feasibility Analysis And Is Not Required By Resolution 92-49, And Is Technically Invalid

As discussed in NASSCO's Response to EHC/Coastkeeper Comment No. 1, above, there is no requirement in Resolution 92-49 that requires a constituent-by-constituent economic feasibility analysis. Moreover, EHC/Coastkeeper's proposed constituent-by-constituent economic feasibility analysis is not scientifically valid.

EHC/Coastkeeper asserts that averaging the pollutant reduction concentration for the five primary COCs, as was done in the DTR masks variability in pollutant exposure reduction for individual pollutants, and suggests that, when pollutants are analyzed individually, progression from cost scenario 6 (\$69.5 million-\$85.3 million) to cost scenario 7 (\$85-\$101.6 million) results in "more than 20% exposure reduction in mercury." However, EHC/Coastkeeper's proposed constituent-by-constituent reanalysis of the economic feasibility data merely illustrates that the five COCs are not identically distributed across the site, without addressing the issue of net remedial cost-benefit. Attachment A, Exponent, Critique of Comments and Untimely Expert Evidence Offered by the Environmental Health Coalition and Coastkeeper, City of San Diego, San Diego Unified Port District, San Diego Gas & Electric, and the U.S. Navy (June 23, 2011) ("Exponent Critique"), at 2. It also confirms that incremental benefits generally decrease with increasing cost. Id. [NASSCO Comment No. 274, CAO at ¶ 31, DTR, at § 31, Appendix 31]

Of particular concern, EHC/Coastkeeper's proposed reanalysis also obfuscates the net benefits, leading to absurd results and illustrating why this analysis is a poor standalone basis for selecting a remedy (something it was never intended to do). Specifically, EHC/Coastkeeper's

proposed analysis fails to recognize that the mercury SWAC achieved in scenario 7 is actually well below the site-specific reference concentration (i.e., background UPL) for mercury. Id. Under current conditions, the mercury SWAC at the shipyard is not highly elevated relative to background (only 1.2x background UPL prior to any remediation), and very quickly approaches background as the highest composite SWAC polygons are remediated. Accordingly, at scenario 6, mercury is essentially at background. Under scenarios 7 to 11, the mercury SWAC is predicted to be below background, because the remaining unremediated stations all have mercury concentrations below the background UPL (see Figure 1, below). Scenarios 9 and 10 actually predict a rise in mercury SWAC with continued remediation, because areas with mercury levels below background are being dredged and the dredged area is assumed to equilibrate to the higher background level after remediation. As a result, the apparent “reduction” in mercury exposure from scenario 6 to scenario 7 actually produces no benefit to the public relative to the reference condition (defined as 100% exposure reduction), at a cost of more than \$16 million.

[NASSCO Comment No. 275, CAO at ¶ 31, DTR, at § 31, Appendix 31]

**Comment ID:** 295

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 5: The Order’s conclusion that cleanup to background water quality levels is economically infeasible is arbitrary and capricious and not supported by substantial evidence in the record.

This comment is addressed in NASSCO’s Response to EHC/Coastkeeper Comment Nos. 4, above.

**Comment ID:** 296

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 6: The economic feasibility analysis arbitrarily assessed costs in six-polygon groups.

This comment is addressed in NASSCO’s Response to EHC/Coastkeeper Comment Nos. 4, above.

**Comment ID:** 297

**Organization:** NASSCO

**DTR Section:** 31; Appendix 31; Table A31-2

**Comment:**

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EHC/Coastkeeper Comment No. 10: There is no explanation in the economic feasibility analysis why polygons identified with a “depth to clean” as the undefined term “sur” have differing “dredging depth[s].”

The term “sur” indicates polygons in which only surface chemistry is available (i.e., from the upper 2 centimeters of sediment). In most cases, a 3-foot dredging depth was assumed, with an

additional one-foot overdepth allowance, representing the minimum practicable thickness of dredging.

There are four exceptions to this assumption, involving cases where immediately adjacent polygons had better-defined depths to clean material. These cases are as follows: (1) the dredging depth at polygons SW13 and SW16 were assumed to be 5 feet because of their position adjacent to SW08 (dredged to 6 feet based on sediment core) and SW17 (dredged to 7 feet based on sediment core); (2) the dredging depth at polygon SW05 was assumed to be 5 feet because of its position adjacent to SW04 and SW02 (both dredged to 5 feet based on sediment cores); (3) the dredging depth at polygon NA15 was assumed to be 7 feet because of its position between NA09 (dredged to 9 feet based on sediment core) and NA17 (dredged to 5 feet based on sediment core).

NASSCO Comment No. 276, DTR, at 31; Appendix 31; Table A31-2]

**Comment ID:** 298

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 11: DTR Appendix 31 Table A31-2 groups the economic feasibility results together in an arbitrary manner.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 4, above.

**Comment ID:** 299

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 12: DTR Figure 31-1 would have looked different if results had been presented for each of the eleven cost scenarios.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 4, above.

**Comment ID:** 300

**Organization:** NASSCO

**DTR Section:** 31, Appendix 31

**Comment:**

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EHC/Coastkeeper Comment No. 13: The DTR incorrectly summarizes cumulative exposure reduction percentages per \$10 million spent.

EHC/Coastkeeper argues that the cumulative exposure reduction calculations provided in the Cleanup Team's discovery response to EHC/Coastkeeper contradicts the assertion in the DTR that "exposure reduction drops below 7 percent per \$10 million after \$33 million, below 4 percent after \$45 million, and drops to zero at \$185 million." DTR, at 32-40. However, in doing so, EHC/Coastkeeper blatantly ignores the distinction between incremental and cumulative costs and benefits.

Consistent with Resolution 92-49, Section 31.2 of the DTR clearly states that the economic feasibility analysis is based on a comparison of incremental costs and benefits, and the conclusion presented is also clearly labeled as having an incremental cost basis, not cumulative. This is appropriate given that an economic feasibility analysis conforming to Resolution 92-49 must determine the point at which additional remediation no longer produces an additional benefit that is sufficient to justify the associated additional expense of such remediation.

[NASSCO Comment No. 277, CAO at ¶ 31, DTR, at § 31, Appendix 31]

**Comment ID:** 301

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 14: The economic feasibility was not determined on a constituent-by-constituent basis.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 4, above.

**Comment ID:** 302

**Organization:** NASSCO

**DTR Section:** 31, Appendix 31

**Comment:**

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EHC/Coastkeeper Comment No. 15: The economic feasibility data was not presented in a scaled manner.

The analysis presented in EHC/Coastkeeper Comments, Figure 3 differs only in form from that presented in EHC/Coastkeeper Comments, Figure 2. It contains no additional information, other than the inclusion of background as a reference point. Consistent with the bar chart, a slope change in the plotted figure (i.e., a decrease in benefit per unit cost) can be seen at approximately \$33 million total cost. The benefit/cost ratio generally continues to decrease with costs above this point.

[NASSCO Comment No. 278, CAO at ¶ 31, DTR, at § 31, Appendix 31]

**Comment ID:** 303

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 16: The DTR's economic feasibility conclusions based on DTR Figure 31-1 are arbitrary and capricious.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 4, above. As discussed in those responses, there is substantial technical and logical support that the DTR actually conservatively estimates the point at which the incremental costs of further cleanup outweigh the incremental benefits.

**Comment ID:** 304

**Organization:** NASSCO

**DTR Section:** 31, 32, Appendices 31, 32

**Comment:**

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EHC/Coastkeeper Comment No. 17: The conclusion that the alternative cleanup levels are the lowest levels economically achievable is arbitrary and capricious and not supported by the evidence.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 4, above. Within the meaning of Resolution 92-49, "economically achievable" and "economically feasible" are specific terms of art referring to the requirement that the Regional Board engage in "an objective balancing of the incremental benefit of attaining further reduction in the concentrations of primary COCs as compared with the incremental cost of achieving those reductions." DTR, at 31-1. Resolution 92-49 explicitly states that these terms "do not refer to the dischargers' ability to finance the cleanup." Id.

As discussed above, applying Resolution 92-49, there is ample evidence in the record demonstrating that cleanup to background is economically infeasible, and the alternative cleanup levels are overly-conservative and economically infeasible. Exponent Report, at 19-13, Barker Depo, at 204:21 – 206:6. EHC/Coastkeeper has cited no evidence in the record to support the contention that lower cleanup levels are economically feasible.

[NASSCO Comment No. 279, CAO at ¶¶ 31, 32, DTR, at §§ 31, 32, Appendices 31, 32]

**Comment ID:** 305

**Organization:** NASSCO

**DTR Section:** 31

**Comment:**

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EHC/Coastkeeper Comment No. 18: The economic feasibility analysis fails to demonstrate that the chosen alternative cleanup levels represent the "best water quality" based on all demands.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 4, above.

**Comment ID:** 306

**Organization:** NASSCO

**DTR Section:** 32, 33, 34, Appendix 32

**Comment:**

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EHC/Coastkeeper Comment No. 19: The Order fails to meet legal requirements for cleanup to pollutant levels greater than background.

In selecting the alternative cleanup levels, the Regional Board expressly considered the requirements of Resolution 92-49 and California Code of Regulations Section 2550.4. TCAO, at ¶ 32; DTR, at 32-1 – 32-2. In doing so, the Regional Board set alternative levels on a constituent by constituent basis for primary COCs, using the post-remedial SWAC as a concentration limit. TCAO, at ¶ 32. Primary COCs are those associated with the greatest exceedance of background,

and the highest magnitude of potential risk at the Site. Secondary COCs, which are associated with lower exceedances of background, are highly correlated with Primary COCs and are likewise addressed in the common footprint. The Regional Board also assessed risk to wildlife receptors under projected post-remedial conditions, and confirmed that the alternative cleanup levels adequately protect aquatic-dependent wildlife and human health beneficial uses. DTR, at § 32. By contrast, EHC and Coastkeeper have provided no credible evidence that concentrations below the proposed alternative cleanup levels, but above background, pose “substantial present or potential hazard to human health or the environment.”

After implementing the SWAC approach, it is true that some sediment concentrations at the surface will exceed the post-remedial SWAC threshold, and some will be below it; however, such an approach is acceptable under Resolution 92-49 since natural processes can be relied on to reduce concentrations below the alternative cleanup level within a reasonable time. Because monitored natural attenuation is already occurring at the Site, deposition of clean sediment in the excavated areas and other natural recovery processes would lower the SWAC further in the years following sediment removal, and all concentrations are expected to meet the alternative cleanup level within a reasonable time. See NASSCO’s Initial Comments, at 39-41 (citing substantial evidence that monitored natural attenuation is occurring).

EHC/Coastkeeper also suggests that the 120% of background trigger level for additional dredging could lead to site-wide pollutant concentrations above the alternative clean-up levels. However, the 120% trigger simply recognizes natural variability in sediment chemical concentrations. As stated in Section 34 of the DTR, “environmental data has natural variability which does not represent a true difference from expected values.” DTR, at 34-1 (emphasis added). The 120% trigger is thus intended only to prevent additional unnecessary dredging due to natural variability, and does not represent “a process by that [sic] allows the remediated areas to be 20% more polluted than background pollutant levels,” as EHC/Coastkeeper suggests. Further, the details concerning the application of this trigger level will be proposed and reviewed thoroughly for technical adequacy in conjunction with the development of the Remediation Monitoring Plan.

[NASSCO Comment No. 280, CAO at ¶¶ 32, 33, 34, DTR, at §§ 32, 33, 34, Appendix 32]

**Comment ID:** 307

**Organization:** NASSCO

**DTR Section:** 32, Appendix 32

**Comment:**

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Same as Comment ID 60

EHC/Coastkeeper Comment No. 20: The site-wide alternative cleanup levels were calculated based on remediating to background pollutant levels.

It is correct that post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint would be remediated to the background UPL concentrations derived in Section 29 of the DTR. DTR, at 32-12. However, it should be noted that in reality, the SWAC within the footprint following remediation may well be less than the background UPL, or result in chemical concentrations below background in certain areas.



In order to calculate a Sitewide post-remedial SWAC for any scenario or reason, it is necessary to assume an average COC concentration for the remediated area. Attachment A, Exponent Critique, at 3. Background was selected as a conservative (i.e., more protective) alternative to lower values, even though the site data clearly show that areas with individual COC concentrations below the background UPL currently exist at the Site, which suggests that concentrations are likely to be even lower following remediation. Thus, EHC/Coastkeeper's concern that the post-remedial SWAC is not protective is invalid.

[NASSCO Comment No. 281, CAO at ¶ 32, DTR, at § 32, Appendix 32]

**Comment ID:** 308

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 21: The remediation monitoring fails to require remedial areas to achieve background levels.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 19, above.

[NASSCO Comment No. 282, CAO at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 309

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 22: The "120% of background" could lead to site-wide pollutant concentrations above the Alternative Clean-up Levels.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 19, above.

[NASSCO Comment No. 283, CAO at ¶ 34, Directive A.2.a, DTR at § 34, Appendix 34]

**Comment ID:** 310

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 23: The Regional Board cannot approve the Order and DTR with the 120% of background second-pass rule because it fails to ensure that Alternative Cleanup Levels will not be exceeded.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 19, above.

[NASSCO Comment No. 284, CAO at ¶ 34, Directive A.2.a, DTR at § 34, Appendix 34]

**Comment ID:** 311

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 24: The “120% of background” decision rule violates the Order’s corrective action directive.

This comment is addressed in NASSCO’s Response to EHC/Coastkeeper Comment No. 19, above.

[NASSCO Comment No. 285, CAO at ¶ 34, Directive A.2.a; A.2.c, DTR at § 34, Appendix 34]

**Comment ID:** 312

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 25: The “120% of background” decision rule for a second dredging pass is ambiguous.

This comment is addressed in NASSCO’s Response to EHC/Coastkeeper Comment No. 19, above.

[NASSCO Comment No. 286, CAO at ¶ 34, Directive A.2.a, DTR at § 34, Appendix 34]

**Comment ID:** 313

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 26: The Post Remedial Monitoring fails to evaluate whether Alternative Cleanup Levels are achieved.

The post-remedial monitoring plan is the most extensive ever adopted by the Regional Board for a Site not involving a sediment cap. Deposition of David Gibson (“Gibson Depo”), at 133:17 – 135:7 (describing the post-remedial monitoring plan as “extensive” and unprecedented in scope). Further, the assertion that the post-remedial monitoring plan “considers the remedy ‘successful’ at pollutant concentrations greater than the alternative cleanup levels” is misleading. Rather, when measuring post-remedial sediment conditions, it is necessary to take into account the natural variability in the data collected when determining whether the alternative cleanup levels have been met. Gibson Depo, at 133:17 – 135:7. The trigger concentrations were thus developed appropriately, recognizing the reality that measurements of sediment chemical concentrations always are associated with some degree of error. Thus, trigger concentrations were set to “represent the surface-area weighted average concentration expected after cleanup, accounting for the variability in measured concentrations throughout the area” in recognition that “it is critical to account for the variability of the predicted post-remedial SWAC.” DTR, at 34-7.

[NASSCO Comment No. 287, CAO at ¶ 34, Order Directive D, DTR at § 34, Appendix 34]

**Comment ID:** 314

**Organization:** NASSCO

**DTR Section:** 33, 34, Appendices 33, 34

**Comment:**

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EHC/Coastkeeper Comment No. 27: The Order sets the “Remedial Goals” as compliance with “Trigger Concentrations” above the Alternative Cleanup Levels - and in some cases ABOVE existing pollutant levels.

As described in the DTR, post-remedial trigger concentrations seek to account for random variation that is inherent in any sampling data. DTR, at 34-7. It has been determined that a post-remedial SWAC concentration equivalent to the trigger concentration is statistically indistinguishable from the target post-remedial SWAC, given the number of samples that make up the SWAC. Attachment A, Exponent Critique, at 4.

EHC/Coastkeeper’s assertion that the cleanup can be completed without removing any mercury from the Site is misleading, and takes the post-remedial trigger out of the context in which it is to be used. While the trigger concentration for mercury (0.78 mg/kg) is higher than the pre-remedial Sitewide SWAC (0.72 mg/kg), it is much lower than the concentration in the remedial footprint. As noted above (see response to Comment No. 14), the mercury SWAC at the Site is not highly elevated (1.2x background), and average mercury levels do not presently pose a significant risk to any receptor. The primary cleanup goal with respect to mercury is to remove isolated areas of elevated mercury, not to lower the Sitewide SWAC. Elevated mercury is limited to a few areas, and these areas have been targeted by the DTR recommended cleanup. Eight of the 10 polygons with the highest surface concentrations of mercury are included in the proposed footprint (see DTR Table 33-4), with concentrations ranging from 4.5 to 1.2 mg/kg. The post-remedial monitoring program will ensure that these target areas are remediated, and verify that the target Sitewide mercury SWAC (which is only slightly lower than the pre-remedial SWAC) is achieved within reasonable statistical precision. Id.

Figure 1:

[NASSCO Comment No. 288, CAO at ¶¶ 33, 34, Order Directive D, DTR at §§ 33, 34, Appendices 33, 34]

**Comment ID:** 315

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 28: The Post Remedial Monitoring program will mask ongoing pollutant problems.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 64-65, 68.

Compositing samples over the entire site is a meaningful way to analyze and assess average concentrations across the site. Sitewide average concentration (in the form of SWAC) is the

basis for specifying the alternative cleanup levels, and is the appropriate basis on which to assess cleanup success. Attachment A, Exponent Critique, at 4.

The stratification scheme described in the DTR is intended to provide interpretive information concerning the spatial distribution of COC concentrations throughout the Site, and will document, not mask, the true spatial extent of COC concentrations throughout the Site. Id.

Similarly, the subsampling and replication framework described in Section D of the TCAO is an appropriate method to assess whether the alternative cleanup levels were achieved and the remediation was successful. Id. Collecting replicates is useful to provide an estimate of variances in the compositing process, and will improve the estimates of the COC concentrations in each of the polygon groups and facilitate evaluation of remedy effectiveness. Id.

[NASSCO Comment No. 289, CAO at ¶ 34, Directive D, DTR at § 34, Appendix 34]

**Comment ID:** 316

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 29: The Post Remedial Monitoring program fails to require samples from each polygon at the site.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 28, above.

In addition to composited average concentrations at areas across the Site, post-remedial toxicity testing will be conducted at a specified number of stations within the remedial footprint, to assess that organisms with a small home range are protected (see DTR Section 34.2.3).

[NASSCO Comment No. 290, CAO at ¶ 34, Directive D.1.c, DTR at § 34, Appendix 34]

**Comment ID:** 317

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 30: Compositing surface sediment into six polygon groups during Post Remedial Monitoring will mask the true extent of contamination remaining at the Shipyard Sediment Site.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 28 and 32.

[NASSCO Comment No. 291, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 318

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 31: The "success" of the clean-up will rely heavily on data from polygons that were not dredged.

Sitewide SWAC values are being used to assess the cleanup success. It is necessary to determine SWAC values in order to evaluate whether the remedial goals expressed in the alternative cleanup levels have been met, and SWAC measurements necessarily include data from areas outside the remedial footprint. Attachment A, Exponent Critique, at 5.

[NASSCO Comment No. 292, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 319

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 32: The Post Remedial Monitoring program's six sampling areas are arbitrary.

The six sampling areas were defined in a systematic and rational manner. Attachment A, Exponent Critique, at 5. Site stations were pooled into zones of each shipyard with similar size, bathymetry, distance from shore, and COC concentration. Id. All polygons within a group are either contiguous or in close proximity. Id.

[NASSCO Comment No. 293, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 320

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 33: The Post Remedial Monitoring plan's requirement to test replicate sub-samples of composited sediment samples tests how good the lab is, not the variability of pollutants remaining at the Site.

The described replication is not intended to assess variability in the site chemistry or conditions. As described in the DTR, "The three replicate sub-samples of composite samples provide an estimate of variances in the compositing process" (DTR, page 34-5). This is an important quality control check on the post-remedial monitoring procedure. Attachment A, Exponent Critique, at 5.

[NASSCO Comment No. 294, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 321

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 34: The Post Remedial Monitoring plan will not provide the data to verify whether the remediation has been effective in protecting human health and aquatic-dependent wildlife.

The post-remedial monitoring plan is designed to verify that remedial objectives (i.e., post-remedial SWAC values) have been met, and is among most extensive ever imposed in any sediment cleanup in San Diego Bay. Gibson Depo, at 133:17 – 135:7. It has been determined by the Regional Board Staff and demonstrated in the DTR that these objectives are protective of beneficial uses. Further, as NASSCO discussed extensively in its initial comments, there is substantial evidence that the remedial objectives, which are much lower than previous cleanups as similar sites in San Diego Bay, are overly conservative.

[NASSCO Comment No. 295, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 322

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 35: The sub-sampling approach will not provide Regional Board staff with the information necessary to determine whether remediation has been effective at protecting human health or aquatic-dependent wildlife.

This comment is addressed in NASSCO's Response to EHC/Coastkeeper Comment No. 33, above.

[NASSCO Comment No. 296, CAO at ¶ 34, Directive D, DTR, at § 34, Appendix 34]

**Comment ID:** 323

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 36: Failure to assure that the Alternative Cleanup Levels are met through the remediation process renders the cleanup illegal.

As discussed in rebuttal to other comments herein, the TCAO does not fail to assure that the alternative cleanup levels are met through the remediation process. First, it is necessary to assume an average COC concentration for the remediated area in order to calculate a sitewide post-remedial SWAC. Attachment A, Exponent Critique, at 5. The fact that the post-remedial SWAC calculations were completed with the assumption that the SWAC inside the footprint will be remediated to the background concentrations derived in Section 29 of the DTR is a conservative (i.e., protective) assumption, since it is likely that the SWAC within the remedial footprint following the remediation will be less than the background UPL. Id.

Second, the 120% background trigger for a second dredging pass is not a "failure to assure the alternative cleanup levels are met." Rather, this is a means of accounting for the natural variability in sediment conditions in determining whether the alternative cleanup levels have been met. Gibson Depo, at 133:17 – 135:7 (confirming that there is natural variability in the data collected, and that the purpose of post-remedial monitoring is to ensure the cleanup standard has been met); Id. If such variability is not accounted for, additional dredging could be triggered even though the post-remedial SWAC has been met. Accordingly, "it is critical to account for

the variability of the predicted post-remedial SWAC” and trigger concentrations must be set to “represent the surface-area weighted average concentration expected after cleanup, accounting for the variability in measured concentrations throughout the area.” DTR, at 34-7. The trigger concentrations were thus developed appropriately, recognizing the reality that measurements of sediment chemical concentrations always are associated with some degree of error.

[NASSCO Comment No. 297, CAO at ¶ 34, Directive D.6, DTR, at § 34, Appendix 34]

**Comment ID:** 324

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

EHC/Coastkeeper Comment No. 37: The proposed cleanup fails to require the best water quality reasonable.

Resolution 92-49 authorizes the Regional Board to set cleanup levels above background, where background conditions cannot be restored considering economic and other factors. DTR, at 36-7. Any determination of “the best water quality reasonable” must therefore include an economic feasibility analysis; for the reasons discussed above, the Regional Board’s analysis is overly conservative, and monitored natural attenuation is the only economically feasible remedy, given the minimal incremental benefit associated with active remediation versus monitored natural attenuation. Exponent Report, at 19-13; Barker Depo, at 204:21 – 206:6.

EHC/Coastkeeper argues that the proposed cleanup fails to require the best water quality reasonable for the following reasons: (1) narrative alternative cleanup levels for aquatic life cannot ensure that beneficial uses will not be unreasonably affected at the Site; (2) the footprint is too small; and (3) the remedial and post-remedial monitoring are insufficient. Each of these erroneous assertions is addressed in reply to EHC/Coastkeeper Comment Nos. 38 – 77, below.

[NASSCO Comment No. 298, CAO at ¶¶ 32, 33, Directives A, B.1.1, D, DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 325

**Organization:** NASSCO

**DTR Section:** 32

**Comment:**

EHC/Coastkeeper Comment No. 38: The Alternative Clean-up Levels cannot ensure that fish and benthic invertebrate beneficial uses will not be unreasonably affected at the Shipyard Sediment Site.

Benthic invertebrate communities are protected by inclusion of “likely impacted” Triad stations in the proposed remedial footprint, and application of protective site-specific chemistry benchmarks (SS-MEQ and LAET), as well as additional safety buffers, to assess non-Triad stations. Attachment A, Exponent Critique, at 6. Moreover, a detailed statistical comparison of histopathology (i.e., incidence of lesions) in fish captured at the Site with reference area fish has

already indicated that there are no significant adverse effects in Site fish as a result of observed chemistry concentrations. Exponent Report, at §§ 8.2, 9.3.4.

[NASSCO Comment No. 299, TCAO, at ¶ 32, Directives A.2.a, A.2.c, DTR, at § 32]

**Comment ID:** 326

**Organization:** NASSCO

**DTR Section:** 17, 29, 32, Appendices 17, 32

**Comment:**

EHC/Coastkeeper Comment No. 39: The Order and DTR fail to include numeric clean-up levels for benthic invertebrates and fish.

EHC/Coastkeeper suggests that the alternative cleanup levels will not be protective of benthic invertebrates and fish, when in fact, the TCAO and DTR are highly protective of both benthic invertebrates and fish.

EHC/Coastkeeper relies primarily on the conclusions in the March 2011 MacDonald Report, which is currently subject to a motion for exclusion due to Mr. MacDonald's unethical conduct during the discovery process (including destruction of evidence). Mr. MacDonald's report acknowledges that "reliance on multiple lines of evidence is generally recommended for assessing contaminated sediments," but claims that the cleanup levels are not protective of aquatic life based on several invalid criticisms, including: (1) SS-MEQ, which is the metric Mr. MacDonald refers to as being used to evaluate sediment chemistry data in the non-triad samples, is not effects-based; (2) the reference pool used to evaluate the results of the amphipod test is invalid because it included several survival values below 80%; and (3) reference pools for the bivalve and echinoderm toxicity tests were invalid because the bivalve reference pool included only four stations and the echinoderm reference pool included two samples with fertilization rates below 70%.

All three of these critiques are invalid. First, Mr. MacDonald's assertion that SS-MEQ does not provide an effects-based tool for predicting adverse effects on benthic communities is incorrect, as the SS-MEQ was specifically developed to be a site-specific, effects-based assessment tool. DTR, at § 32.5.2. It was developed using all six of the "likely" impaired stations that were found at the Site under the DTR's effects-based triad analysis, and is therefore directly analogous to the manner in which Long, et al. (1995) developed ERM values. Attachment A, Exponent Critique, at 6. Further, the predictive reliability of SS-MEQ was evaluated, and a threshold of 0.9 selected, using the site-specific effects determinations for the 30 triad stations, as well as the five supplemental triad stations sampled at the Site. Accordingly, there is no scientific basis for asserting that SS-MEQ is not effects-based. *Id.* Additionally, using SS-MEQ rather than SQGQ1 to assess impacts on benthic communities is justifiable because the SQGQ1 is based on generic sediment quality values that do not explicitly consider site-specific conditions, whereas SS-MEQ is based on chemical and biological data collected at the Site. *Id.*

Second, Mr. MacDonald's criticisms of the reference pool as it relates to the amphipod toxicity test are unfounded. The reference pool for the Site was selected by the Regional Board to comply with EPA guidance, as well as methods commonly used by environmental practitioners in assessing sediment. DTR, at § 17.2 (summarizing EPA guidance documents for reference pool selection). Applicable guidance states that reference areas should reflect the



habitat conditions and background levels of chemical contamination that would exist at a study site in the absence of site-related sediment contamination. Attachment A, Exponent Critique at 7. Reference conditions should incorporate levels of chemical contamination or biological responses that are considered representative of the general conditions of a water body removed. Thus, the DTR appropriately sought to select reference areas “consistent with the San Diego Water Board’s goal of establishing a reference condition that represents contemporary bay-wide ambient background contaminant levels that could be expected to exist in the absence of the Shipyard Sediment Site discharges and some level of natural variability in toxicity and benthic communities that could exist due to factors other than sediment contamination.” *Id.* If, as Mr. MacDonald suggests, reference stations with amphipod survival of less than 80% were excluded, the analysis would ignore the full range of responses that occur in valid reference areas in San Diego Bay, and bias the analysis to in favor of a pre-conceived notion concerning what the minimum level of survival in reference areas should be. Notably, sediment management standards from other jurisdictions recognize that amphipod survival in reference areas may be as low as 75%. See BAE Initial Comments (citing Washington State Sediment Management Standards (Ecology 1995); Phillips et al. (2001)).

Third, Mr. MacDonald’s criticisms of the reference pools for the remaining toxicity tests are also unjustified. In addition to the above discussion concerning the selection of reference pools, the results of the DTR bivalve and echinoderm tests were the same as those found by Exponent, using a different reference pool and different statistical procedures (analysis of variance vs. reference envelope). *Id.* Accordingly, these results demonstrate that the statistical results for both tests are robust, since they were the same under two different methods of analysis. *Id.*

Lastly, Mr. MacDonald’s criticisms focus on the toxicity results for reference stations to the exclusion of other factors involved in selection of the reference pool; however, additional information, such as chemistry and benthic community information, was also used to select the reference pool.

[NASSCO Comment No. 300, TCAO, at ¶¶ 17, 29, 32, Directives A.2.a, A.2.c, DTR, at § 17, 29, 32, Appendices 17, 32]

**Comment ID:** 327

**Organization:** NASSCO

**DTR Section:** 15, 32, Appendices 15, 32

**Comment:**

EHC/Coastkeeper Comment No. 40: Failure to include numeric cleanup levels to protect fish is particularly egregious, as no information was presented in the Order or the DTR on how the potential for adverse effects on fish were explicitly considered.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 60.

EHC/Coastkeeper erroneously states that the TCAO and DTR provide no information concerning the potential for adverse effects on fish at the Site. However, the DTR contains detailed analyses assessing impacts to spotted sand bass, including fish histopathology analysis and PAH metabolite analysis in fish bile, as well as evaluations of chemistry data and indirect impacts to fish via the benthic community. Exponent Report, at §§8.2, 8.3, 9.3.4, 9.3.5. As discussed in NASSCO’s Initial Comments, empirical data were collected at the Site and

evaluated for effects on spotted sand bass, and unacceptable risks were not found. Exponent Report, at §§8.2, 8.3, 9.3.4, 9.3.5. The Regional Board also conducted an independent analysis, based on the data collected by Exponent, extensively evaluating the potential effects of sediment contamination on fish at the Site, and concluded that no effects could be conclusively attributed to contaminant exposure at the Site. DTR, at A15.1, A15.2. Because no adverse effects on fish were detected, numeric cleanup levels for fish are not necessary. Attachment A, Exponent Critique, at pp. 7-8. Moreover, even though there are no demonstrated adverse effects on fish, the TCAO conservatively requires remediation of “all areas determined to have sediment pollutant levels likely to adversely affect the health of the benthic community,” which would also protect benthic fish. TCAO, at Table 2; Attachment A, Exponent Critique, at 8.

[NASSCO Comment No. 301, TCAO, at ¶¶ 15, 32, Directives A.2.a, A.2.c, DTR, at §§ 15, 32, Appendices 15, 32]

**Comment ID:** 328

**Organization:** NASSCO

**DTR Section:** 14-19, 32, Appendices 15, 17, 18, 19, 32

**Comment:**

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EHC/Coastkeeper Comment No. 41: The lines of evidence developed to assess benthic invertebrate communities are likely to be minimally protective as they rely on comparisons to a reference pool that included samples that would not meet criteria for negative control samples.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 59-60.

Consistent with California Water Code Section 13304 and State Water Board Resolution, a reference pool should represent San Diego Bay conditions absent Shipyard Sediment Site discharges. That is, an appropriate reference pool for benthic community assessment should include all stressors and conditions that could affect the benthic community, with the exception of site-related chemical contamination. Attachment A, Exponent Critique, at 8. The DTR correctly states that the reference pool is intended to distinguish between pollution effects at the Site, and those found generally in the surrounding water body. DTR, at 17-2. Meeting criteria for negative laboratory controls is not a criterion for reference selection. Id. Attachment A, Exponent Critique, at \_\_\_. The presence of all non-Site related stressors, including background chemical contamination, are part of the reference condition. Id.

[NASSCO Comment No. 302, TCAO, at ¶¶ 14-19, 32, Directives A.2.a, A.2.c, DTR, at §§ 14-19, 32, Appendices 15, 17, 18, 19, 32]

**Comment ID:** 329

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

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EHC/Coastkeeper Comment No. 42: The Proposed Remedial Footprint is too small to ensure that the remaining pollutant levels will not unreasonably affect present and anticipated beneficial uses of San Diego Bay.

Size of the remedial footprint is irrelevant to the assessment of beneficial uses or remediation to mitigate beneficial use impairment. Attachment A, Exponent Critique, at 8. The only relevant consideration is whether residual sediment chemicals are protective of beneficial uses, as determined by exposure assessment on an appropriate spatial scale. *Id.* At many sites, remedial goals can be achieved through the selective removal of hot spot contamination. *Id.*

Further, there is ample evidence set forth in NASSCO's Initial Comments demonstrating that the cleanup is excessively conservative, and that site conditions do not warrant any remediation beyond monitored natural attenuation, which is already occurring.

[NASSCO Comment No. 303, TCAO, at ¶¶ 32, 33, Attachment 2, DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 330

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

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EHC/Coastkeeper Comment No. 43: Problems with the development of the Proposed Remedial Footprint results in a cleanup that achieves less than the best water quality reasonable.

EHC/Coastkeeper states that the following five factors relating to the development of the footprint result in a cleanup that achieves less than the best water quality reasonable: (1) an insufficient number of samples were collected to accurately determine the nature and extent of contamination at the Site, given the variability of contaminants; (2) ranking the polygons using the SWAC value fails to consider potential adverse effects on human health or the environment, and ignores certain contaminants; (3) the footprint excludes 15 polygons with higher chemistry than the least-contaminated polygon in the proposed footprint; (4) the thresholds used to determine whether polygons are "Likely" impacted are problematic, including the use of SS-MEQ and 60% LAET; and (5) the DTR does not adequately consider potential adverse effects on fish with small home ranges.

First, as discussed in NASSCO's Initial Comments, Site conditions are generally favorable, and any active remediation will result in only minimal benefits. Second, under Resolution 92-49, the Regional Board is required to consider economic feasibility in setting alternative cleanup levels; an expanded footprint would not be consistent with the requirements of Resolution 92-49 given the fact that only minimal benefits, if any, would be achieved, at substantial cost to the parties named to the TCAO. Third, for the reasons discussed below, these comments are without scientific merit, and do not support an expanded footprint.

[NASSCO Comment No. 304, TCAO, at ¶¶ 32, 33, DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 331

**Organization:** NASSCO

**DTR Section:** 13, 32, Appendix 32

**Comment:**

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EHC/Coastkeeper Comment No. 44: An insufficient number of samples were collected to accurately determine the nature and extent of contamination at the 148-acre Shipyard Site, given the variability of contaminants at the site.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 30.

EHC/Coastkeeper suggests that an insufficient number of samples were collected to accurately determine the nature and extent of contamination at the Site; however the sediment investigation by Exponent, upon which the DTR analyses are based, was conducted with substantial oversight from the Regional Board and has been described by Regional Board Staff ("Staff") as "the most extensive sediment investigation even conducted for a site in San Diego Bay," if not California. Barker Depo, at 80:2 – 80:22; 82:3 – 82:4, 83:14 – 83:23. See also DTR, at 13-2 – 13-3 (summarizing Staff and stakeholder involvement in the sediment investigation); Exponent Report, at 1-2 – 1-4 (summarizing the directives and guidance provided by Staff throughout the planning and execution of the sediment investigation and Exponent Report. Staff confirmed that approximately 65 stations were sampled, including 30 triad stations, 35 non-triad stations, with sediment chemistry and benthic community profiling data collected. Barker Depo, at 80:2 – 80:22. Staff did not recall collecting 30 or more triad stations for any other sediment matter in San Diego Bay. Id. Further, Staff described the study as "detailed" and "very thorough." Id., at 82:3 – 82:4, 82:14 – 83:23.

The Site assessment approach, including the sample types, number, and density were all thoroughly vetted by Board Staff prior to implementation in 2001. The DTR analyzes data collected from 60 stations throughout the Site, distributed consistent with the manner in which most investigations are designed at sediment sites. Stations were distributed with the highest density near sources where the highest COC concentrations would be expected, and with lower densities in areas further removed from potential sources, where contaminants would be expected to be more widely dispersed by winds, waves, and tides. In fact, Mr. MacDonald described exactly this type of distribution scheme when he suggested that "to address concerns regarding spatial variability in sediment chemistry, investigators frequently design sediment sampling programs to provide a high density of samples in the vicinity of point sources discharges." March 2011 MacDonald Report, at 10. Given the extensive and unparalleled scope of the sediment investigation, including the number of stations sampled, the contention that an insufficient number of stations were analyzed is unsupported.

[NASSCO Comment No. 305, TCAO, at ¶¶ 13, 32, DTR, at §§ 13, 32, Appendix 32]

**Comment ID:** 332

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

EHC/Coastkeeper Comment No. 45: Ranking the polygons from most- to least-contaminated using the Composite Surface Weighted Average Concentration (SWAC) Value fails to consider the potential adverse effects on human health or the environment.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 31-32.

EHC/Coastkeeper states, without explanation, that ranking polygons from most to least contaminated using the composite SWAC value fails to consider the potential adverse effects on human health or the environment, citing to MacDonald who reiterates the same unsupported

conclusion. EHC/Coastkeeper has provided no credible evidence that the proposed TCAO is not protective of human health or the environment.

[NASSCO Comment No. 306, TCAO, at ¶¶ 32, 33, DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 333

**Organization:** NASSCO

**DTR Section:** 33, Appendix 33

**Comment:**

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EHC/Coastkeeper Comment No. 46: The Proposed Remedial Footprint arbitrarily excludes 15 polygons that are more contaminated - from a sediment chemistry standpoint - than the least-contaminated polygon in the Proposed Remedial Footprint.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 43, 57.

[NASSCO Comment No. 307, TCAO, at ¶ 33, DTR, at § 33, Appendix 33]

**Comment ID:** 334

**Organization:** NASSCO

**DTR Section:** 32, Appendix 32

**Comment:**

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EHC/Coastkeeper Comment No. 47: The thresholds the DTR uses to determining [sic] whether polygons that are "Likely" impacted are problematic.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 64-65, 68.

[NASSCO Comment No. 308, TCAO, at ¶ 32, DTR, at § 32, Appendix 32]

**Comment ID:** 335

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

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EHC/Coastkeeper Comment No. 48: The Proposed Remedial Footprint excludes eight polygons that, under the DTR's own methodology, should have been included.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 54-55.

[NASSCO Comment No. 309, TCAO, at ¶¶ 32, 33, Attachment 2; DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 336

**Organization:** NASSCO

**DTR Section:** 33, Appendix 33

**Comment:**

EHC/Coastkeeper Comment No. 49: The Proposed Remedial Footprint improperly excludes NA22.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 55.

EHC/Coastkeeper states that the inclusion of NA22 within the area being evaluated as part of the TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas Creek is an insufficient basis for excluding it from the instant cleanup. NASSCO incorporates by reference the comments previously submitted by BAE on this issue. BAE Initial Comments, at 42:23 – 43:13. The TCAO and DTR are clear that the Regional Board made an informed administrative decision to exclude NA22 from consideration as part of the Shipyard Sediment Site for purposes of the TCAO. TCAO, at ¶ 33; DTR, at 33-3.

Although the triad weight-of-the-evidence analysis categorized NA22 as “Likely” impaired, this designation was based upon “Moderate” chemistry, toxicity, and benthic community results for each of the three legs of the triad. DTR, at 33-4 (citing Table 18-1). However, NA22 is an area where propeller testing occurs routinely, suggesting that the observed benthic condition may be the result of physical impacts, rather than site contaminants. DTR, at 33-4. Additional sampling in connection with the TMDL proceeding may clarify the cause of the potential impairment, and permit the Regional Board to make a more fully informed decision concerning what, if any, remediation is required. Because there is expected to be substantially more data available to evaluate the cause of observed impacts to NA22 following the completion of the TMDL proceedings than is presently available, the Regional Board's decision to exclude NA22 from the current cleanup is reasonable.

[NASSCO Comment No. 310, TCAO, at ¶ 33, Attachment 2; DTR, at § 33, Appendix 33]

**Comment ID:** 337

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

EHC/Coastkeeper Comment No. 50: The Proposed Remedial Footprint excludes - NA01, NA04, NA07, NA16, SW06, SW18 and SW29 - which pose unacceptable risks to fish and the benthic community.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 54, 57.

[NASSCO Comment No. 311, TCAO, at ¶¶ 32, 33, Attachment 2; DTR, at §§ 32, 33, Appendices 32, 33]

**Comment ID:** 338

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 51: The Remediation Monitoring is insufficient to assess remedial activities' impacts on water quality, to evaluate the effectiveness of remedial measures, or to identify the need for further dredging to achieve clean-up goals at the Shipyard Sediment Site.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 62-63.

[NASSCO Comment No. 312, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 339

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 52: The water quality component of the Remediation Monitoring program fails to provide safeguards to ensure data collected reveals actual water quality conditions.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 62, 64-65.

[NASSCO Comment No. 313, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 340

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 53: The Remediation Monitoring program allows the Dischargers to measure compliance with ambiguous water quality monitoring goals through modeling, which will not provide data of actual conditions sufficient to determine whether dredging is violating water quality standards.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 66.

[NASSCO Comment No. 314, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 341

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 54: The Remediation Monitoring allows Dischargers to abandon daily water quality monitoring if no samples exceed water quality targets for three days in a row. Abandoning daily monitoring is problematic because it [sic] the variability in turbidity or dissolved oxygen levels is not associated primarily with operation of the dredge.

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NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 315, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 342

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 55: The Remediation Monitoring fails to specify the numeric "water quality standards" that must be complied with during remediation.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 62.

[NASSCO Comment No. 316, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 343

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 56: The Remediation Monitoring fails to require dischargers to take all the samples from down-current locations.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 64..

[NASSCO Comment No. 317, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 344

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 57: The Remediation Monitoring fails to define the "construction area."

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 64.

[NASSCO Comment No. 318, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 345

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 58: The Remediation Monitoring mandates that samples be collected 10 feet deep instead of the depth with the highest level of monitored variables.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 319, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 346

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 59: The Remediation Monitoring fails to require that water samples need to be collected long enough after dredging commences for the day to give the plume time to reach the sampling location.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 320, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 347

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 60: The Remediation Monitoring fails to specify which best management practices should be employed to reduce or eliminate resuspended sediments from being [sic] traveling to other areas, harming water quality or recontaminating adjacent areas.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 321, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 348

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 61: The sediment component of the Remediation Monitoring program fails to require data collection to confirm Cleanup Levels are achieved.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 322, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 349

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 62: The Order and DTR provide inconsistent sampling requirements; the Order requires that samples be collected deeper than the upper 5cm, while the DTR requires that samples be collected deeper than the upper 10cm.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 66.

[NASSCO Comment No. 323, TCAO, at ¶ 34, Directive A.2.a, DTR, at § 34, Appendix 34]

**Comment ID:** 350

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 63: Vagueness in the monitoring requirements permits Discharges to collect only one sample from each polygon, which is insufficient given the sediment chemistry variability within polygons.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 324, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 351

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 64: Vagueness in the monitoring requirements allows sediment sampling to target the historic sampling locations, leaving other locations within the remedial footprint unsampled and ignoring elevated contaminant levels that may occur in those unsampled areas.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 65.

[NASSCO Comment No. 325, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 352

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 65: The DTR explains a sampling protocol that requires the sampling team to visually examine each sediment sample and try to identify "undisturbed

sediments.” These sampling procedures are inappropriate and will be nearly impossible for sampling teams to follow consistently.

The final sampling procedures will be proposed and reviewed for technical adequacy as part of the Remediation Monitoring Plan.

[NASSCO Comment No. 326, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 353

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 66: The DTR explains that a sand cap would be necessary at times, but the Remediation Monitoring fails to explain what those criteria are and who would make such determination.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 66.

[NASSCO Comment No. 327, TCAO, at ¶ 34, Directive B.1.1, DTR, at § 34, Appendix 34]

**Comment ID:** 354

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 67: The Post Remedial Monitoring program is poorly designed and will not require data collection to accurately evaluate post-remediation conditions.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 67-73.

[NASSCO Comment No. 328, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 355

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 68: Post Remedial Monitoring excludes NA22 wholesale from the Post Remedial Monitoring plan, even though NA22 is part of the Site. NA22 must be included in any Post Remedial Monitoring because it is a part of the Shipyard Sediment Site.

NASSCO agrees with BAE’s comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 42, 55, 57. NASSCO also incorporates its response to EHC/Coastkeeper Comment No. 49, concerning the bases for excluding NA22 from the Site for purposes of the TCAO.

[NASSCO Comment No. 329, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 356

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 69: The approach to evaluating post-remedial conditions is likely to underestimate sediment toxicity because the DTR relied on inappropriate thresholds.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 34-36.

[NASSCO Comment No. 330, TCAO, at ¶ 34, Directive D.1.c, DTR, at § 34, Appendix 34]

**Comment ID:** 357

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 70: Requiring sediment samples to be collected at only five sampling stations to evaluate benthic community conditions is inadequate because it will provide data on only about eight percent of the polygons at the Sediment Shipyard Site.

As stated in the DTR, "The purpose of assessing benthic community conditions as part of post-remedy monitoring is to demonstrate the remediation will successfully create conditions that would be expected to promote re-colonization of a healthy benthic community" DTR, at 34-8. There is no intention nor need to re-evaluate the benthic community at the entire Site. Attachment A, Exponent Critique, at 9. The DTR further states "The intent of these benthic community measurements is to track the degree to which the benthic community re-colonizes the area and will not be used to evaluate the success of the remedy" DTR, at 34-11.

[NASSCO Comment No. 331, TCAO, at ¶ 34, Directive D.1.c, DTR, at § 34, Appendix 34]

**Comment ID:** 358

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 71: The Post Remedial Monitoring plan should be expanded to provide a more robust basis for evaluating exposure of benthic invertebrates to contaminants at the site and for assessing sediment toxicity, and include testing from appropriate reference sites.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 73.

[NASSCO Comment No. 332, TCAO, at ¶ 34, Directive D.1.c, DTR, at § 34, Appendix 34]

**Comment ID:** 359

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 72: The Post Remedial Monitoring program's bioaccumulation requirements are insufficient.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 69-70, 72.

[NASSCO Comment No. 333, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 360

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 73: Because the bioaccumulation criteria are not effects-based, they will not be useful for determining if conditions at the Shipyard Sediment Site will be unreasonably affecting San Diego Bay beneficial uses two years, five years, or ten years after the completion of remedial actions.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 70.

Additionally, EHC/Coastkeeper mischaracterizes the intent of the bioaccumulation testing. As stated in the DTR, "The goals of bioaccumulation testing are to show decreasing bioaccumulation over time such that at two years post-remediation, the average of stations sampled shows bioaccumulation levels below what was measured in the Shipyard Report (Exponent, 2003) and that this decreasing trend continues at year five post-remediation and, if determined necessary, at year ten post-remediation" DTR, at 34-6. This is not an effects-based assessment, but a bioavailability assessment.

[NASSCO Comment No. 334, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 361

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 74: Reducing bioaccumulation levels below the pre-remedial levels would not ensure that aquatic organisms utilizing habitats at the site would have tissue concentrations of contaminants of concern low enough to support beneficial uses.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 6, 70, 72.

[NASSCO Comment No. 335, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 362

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 75: The Order fails to include rules specifying what actions the Dischargers must take if sediment chemistry results for the post-remediation sediment samples exceed the thresholds included in the Order.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 73-76.

[NASSCO Comment No. 336, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 363

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 76: The Order fails to include rules specifying what actions the Dischargers must take if toxicity to one or more species is observed during the Post Remedial sampling and testing.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 71, 73.

[NASSCO Comment No. 337, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 364

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

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EHC/Coastkeeper Comment No. 77: The Order does not list the triggers that will be used for evaluating sediment chemistry for benthic exposure.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 74.

[NASSCO Comment No. 338, TCAO, at ¶ 34, Directive D.1, DTR, at § 34, Appendix 34]

**Comment ID:** 365

**Organization:** NASSCO

**DTR Section:** 18, 33, Appendices 18, 33

**Comment:**

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EHC/Coastkeeper Comment No. 78: The DTR incorrectly claims that the Proposed Remedial Footprint "captures 100 percent of triad 'Likely' ... impacted stations."

EHC/Coastkeeper claims that the DTR incorrectly claims that the proposed remedial footprint "captures 100 percent of Triad "Likely" . . . impacted stations" because the proposed remedial

footprint excludes NA22. As discussed above in NASSCO's Response to EHC/Coastkeeper Comment No. 49, the Regional Board made a rational decision to address NA22 as part of the TMDL process, so that additional information concerning the cause of impairment at NA22 could be gathered. This decision was explained thoroughly in the DTR, which clearly states that NA22 "is not considered part of the Shipyard Sediment Site for purposes of the CAO." DTR, at 18-2, 18-11, 18-16, 18-19, 18-23, 18-24, 32-32, § 33.1.1. The decision to exclude NA22 is well within the Regional Board's discretion, and does not render untrue the statement that the proposed remedial footprint "captures 100 percent of Triad "Likely" . . . impacted stations" since for purposes of the TCAO, NA22 was expressly not included in the definition of the Site.

[NASSCO Comment No. 339, TCAO, at ¶¶ 18, 33, DTR, at §§ 18, 33, Appendices 18, 33]

**Comment ID:** 366

**Organization:** NASSCO

**DTR Section:** 31, 33, Appendices 31, 33

**Comment:**

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EHC/Coastkeeper Comment No. 79: The DTR claims that the ranking process "used Triad data and site-specific median effects quotient (SS-MEQ)," but the Excel file used to create the worst-to-least contaminated ranking only includes the SS-MEQ and not Triad data.

The economic feasibility analysis relied on the composite SWAC ranking to determine remedial order, not the Triad data or SS-MEQ values.

[NASSCO Comment No. 340, TCAO, at ¶¶ 31, 33, DTR, at §§ 31, 33, Appendices 31, 33]

**Comment ID:** 367

**Organization:** NASSCO

**DTR Section:** 32, 36

**Comment:**

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EHC/Coastkeeper Comment No. 80: The Order incorrectly concludes that "clean-up of the remedial footprint will restore any injury, destruction, or loss of natural resources." The San Diego Regional Board does not have authority to conduct natural resource damage assessments because only the Natural Resources Trustees have authority to conduct natural resource damage assessments and to draw conclusions regarding injury to natural resources and the effectiveness of remedial actions in terms of restoring natural resource values.

The Regional Board is empowered to "coordinate with the state board and other regional boards, as well as other state agencies with responsibility for water quality, with respect to water quality control matters, including the prevention and abatement of water pollution and nuisance." Cal. Wat. Code § 13225(a). Additionally, as EHC/Coastkeeper has pointed out, under Resolution 92-49, the Regional Board must ensure that constituents at concentrations below the alternative cleanup levels "will not pose a substantial present or potential hazard to human health or the environment," and must also weigh factors including "the current and potential uses of surface waters in the area" and "the potential damage to wildlife [and] vegetation . . . caused by exposure to waste constituents."

The Regional Board has extensively evaluated many of the types of effects that could constitute injury to natural resources at the Site, including exceedances of sediment quality guidelines, sediment toxicity, bioaccumulation, fish histopathology, and risks to wildlife from contaminated prey. Moreover, many of these analyses were developed cooperatively with input from designated Natural Resource Trustees, including U.S. Fish and Wildlife Service, California Department of Game, and the National Oceanographic and Atmospheric Administration. The Regional Board's statement simply articulates that the cleanup of the remedial footprint at the Site will improve environmental conditions such that natural resources, including those evaluated in detail in connection with the Site investigation and cleanup (i.e., benthic macroinvertebrates, fish, and aquatic-dependent wildlife) will benefit from cleanup. Accordingly, it is appropriate and reasonable for the Regional Board to consider whether the cleanup will be protective of natural resources, including whether it will restore any injury, destruction, or loss of natural resources.

[NASSCO Comment No. 341, TCAO, at ¶¶ 32, 36, DTR, at §§ 32, 36]

**Comment ID:** 368

**Organization:** NASSCO

**DTR Section:** 31-34

**Comment:**

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EHC/Coastkeeper Comment No. 81: The DTR repeatedly refers to "65" polygons, even though there are a total of 66 polygons in the Shipyard Sediment Site.

As noted above, station NA22 was specifically excluded from consideration for cleanup because it is being addressed as part of the Mouth of Chollas Creek TMDL determination, currently being undertaken by the Regional Board. Thus the total number of stations was reduced from 66 to 65 for purposes of determining the need for remediation.

[NASSCO Comment No. 342, TCAO, at ¶¶ 31-34, DTR, at §§ 31-34]

**Comment ID:** 369

**Organization:** NASSCO

**DTR Section:** 34

**Comment:**

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EHC/Coastkeeper Comment No. 82: The Order and DTR must require that the remediation achieve the Alternative Clean-up Levels.

EHC/Coastkeeper agree that the proposed Site-Wide Alternative Cleanup Levels are reasonable, but argue that the alternative cleanup levels are not maximum pollutant concentrations because the "120% of background" second-dredging pass and the "Trigger Concentrations" allow the pollutant levels at the Site to exceed the Alternative Cleanup Levels following remediation.

As discussed in NASSCO's Response to EHC/Coastkeeper Comment No. 1, EHC/Coastkeeper misstate the standards for cleanup under Resolution 92-49. Further, as discussed in NASSCO's Response to EHC/Coastkeeper Comment Nos. 19 and 20, the 120% trigger simply recognizes natural variability in sediment chemical concentrations, which does not



represent a true difference from expected values. Accordingly, the 120% trigger serves to prevent unnecessary dredging due to natural variability, and is not a mechanism for allowing the remediated areas to be remain more polluted than background.

[NASSCO Comment No. 343, TCAO, at ¶ 34, Directives B.1, D, DTR, at § 34]

**Comment ID:** 370

**Organization:** NASSCO

**DTR Section:** 31, 32, Appendices 31, 32

**Comment:**

EHC/Coastkeeper Comment No. 83: The Regional Board should make an independent finding of what level of cleanup is economically feasible based on all the evidence in the record regarding economic feasibility.

EHC/Coastkeeper argue that the economic feasibility analysis presented in the DTR is flawed, and suggests that the Regional Board should “independently evaluate the economic feasibility analysis and determine at what point, if any, benefits of additional remediation become ‘negligible’ and above which no further remediation should be required.” As discussed in NASSCO’s Response to EHC/Coastkeeper Comment Nos. 5 through 18, the economic feasibility analysis in the DTR is overly conservative. Thus the Regional Board has already “independently evaluate[d] the economic feasibility analysis and determine[d] at what point, if any, benefits of additional remediation become ‘negligible’ and above which no further remediation should be required.”

Further, EHC/Coastkeeper, without any credible basis or economic feasibility analysis of its own, “urge[s] the Regional Board to set this level well above the \$33 million level set in DTR § 31.” The Regional Board should decline to replace the present analysis, based on the unsupported urgings of EHC/Coastkeeper. To the extent that the Regional Board does revise its economic feasibility analysis, applying Resolution 92-49, the Regional Board should reach the conclusion that only monitored natural attenuation is feasible, in light of the minimal benefits of active remediation as discussed in the Exponent Report, and the Cleanup Team’s admissions that, under Resolution 92-49, the Regional Board could decide that no further cleanup is required if there is no benefit to an incremental cleanup measure. Moreover, one member of the Cleanup Team has admitted that, based on his 20-plus years of experience doing cost estimates and then going out and implementing remediation, the actual cost of remediation often exceeds pre-remediation estimates by as much as an order of magnitude, providing further evidence that the true point at which the incremental benefit is no longer justified by the incremental cost has already been exceeded under the DTR’s economic feasibility analysis in the DTR. See Deposition of Craig Carlisle (“Carlisle Depo”), at 190:16 – 191:5. Thus, the TCAO and DTR analyses are already overly conservative, both in terms of protection of beneficial uses and the feasibility analyses; accordingly, no further cleanup is warranted.

[NASSCO Comment No. 344, TCAO, at ¶¶ 31, 32, DTR, at §§ 31, 32, Appendices 31, 32]

**Comment ID:** 371

**Organization:** NASSCO

**DTR Section:** 31-33, Appendices 31-33

**Comment:**

EHC/Coastkeeper Comment No. 84: The Proposed Remedial Footprint should be enlarged by eight polygons.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 54-57.

[NASSCO Comment No. 345, TCAO, at ¶¶ 31-33, Attachment 2, DTR, at §§ 31-33, Appendices 31-33]

**Comment ID:** 372

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 85: The monitoring requirements should be strengthened to ensure the best water quality reasonable.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 63-65.

[NASSCO Comment No. 346, TCAO, at ¶ 34, Directives B, D, DTR, at § 34, Appendix 34]

**Comment ID:** 373

**Organization:** NASSCO

**DTR Section:** 34, Appendix 34

**Comment:**

EHC/Coastkeeper Comment No. 86: Additional trigger concentrations and triggers for Benthic invertebrates should be added to ensure the best water quality reasonable.

NASSCO agrees with BAE's comments on this topic, and incorporates those comments herein. See BAE Initial Comments, at 63-65.

[NASSCO Comment No. 347, TCAO, at ¶ 34, Directive D.6, DTR, at § 34, Appendix 34]

**Comment ID:** 374

**Organization:** NASSCO

**DTR Section:** 10

**Comment:**

U.S. Navy Comment No. 1: The RWQCB's allegation that significant contaminants from Naval Base San Diego migrated to the Shipyard Sediment Site, either through discharges to Chollas Creek, resuspension of sediments through propeller wash, or via tidal currents is unfounded.

In its comments on the TCAO and DTR, the Navy attempts to downplay its responsibility for sediment contamination that arises from storm water discharges from Naval Base San Diego ("NBSD"), both into Chollas Creek and directly into the San Diego Bay. U.S. Navy's

Comments and Evidentiary Submission (May 26, 2011) (“Navy Comments”). The Navy asserts that:

[T]he Navy’s contribution to contaminant loading in Chollas Creek is negligible as demonstrated by the small relative portion of the Chollas Creek contaminant loading in the Bay that can be attributed to the Navy stormwater discharges, the portion of the solids loading from the Creek that is likely deposited at the shipyard sediment site, the observed spatial gradients of contamination in the area, and the relative chemical signatures of bottom sediments in the area.

Id. at Comment No. 1. The Navy bases its statement on an Apportionment Report, presented as Appendix B to its comments, which estimates that the “potential release to the CAO site from this source is likely to be smaller than 0.08% and is considered to be negligible for all practical purposes.” Navy Comments, Appendix B, Apportionment Report at 22.

This Apportionment Report, along with a number of other attachments to the Navy Comments, should be excluded because they constitute untimely expert reports. See NASSCO’s Joinder In BAE’s Motions to Exclude Untimely Expert Evidence Submitted By the San Diego Unified Port District and San Diego Gas & Electric, and Motion to Exclude the Untimely Expert Evidence Submitted by the United States Navy.

In addition to being untimely, the Navy’s estimate of negligible liability is flawed in a number of respects. First, although the Navy does not specifically acknowledge this point, it essentially agrees with the DTR’s accounting of the Navy’s contribution to copper, zinc, and lead loading to the mouth of Chollas Creek from storm water discharges, copper leaching from Navy ship hulls, and zinc leaching from cathodic protection. For example, the Navy relies on storm water monitoring results for COCs from 2001 that show that the Navy is responsible for a higher percentage of copper and zinc discharges to Chollas Creek than was presented in the DTR. Compare Navy Comments, Appendix B at 17, Fig. 8 (Navy contribution of 7.5% copper, 6.5% zinc, and ~2% lead) with DTR at 10-90 (Navy contribution 5% copper, 4% zinc, and 2% lead). Furthermore, while the DTR also notes that copper leaching from Navy ship hull coatings and zinc leaching from cathodic protection, in addition to storm water contributions, brings the Navy’s pollutant contributions to the mouth of Chollas Creek significantly to “approximately 40% of the copper load, 2% of the lead load, and 18% of the zinc load” (DTR at 10-90), the Apportionment Report concludes that “information needed to calculate a total mass loading of copper and zinc from Navy vessels in the Chollas Creek Channel is not available.” Navy Comments, Appendix B, Apportionment Report at 22.

Second, the Navy underestimates its own storm water contamination sources to the Site by completely omitting any analysis of Outfalls 161 through 171, which are located immediately adjacent to the area where Chollas Creek discharges to the Bay. DTR, 10-27. The DTR states, “[a]vailable U.S. Navy studies (Katz et al., 2003; Chadwick et al., 1999) indicate that pollutants from Chollas Creek outflows, and from NBSD in general (including resuspended sediment), can be conveyed to the Shipyard Sediment Site via storm water flows, tidal currents, and ship movements.” Id.

Third, the Navy Apportionment Report relies heavily on the concept of trapping efficiency, which attempts to describe the amount of sediment and particulate contaminants that are retained near the mouth of Chollas Creek compared to what is exported into the Bay. To estimate trapping efficiency, the Navy relied on model-predicted trapping efficiencies based on two storm

events in February and March 2006, respectively. Navy Comments, Appendix B, Apportionment Report at 19, Table 2.

The critical problem with this argument is that the solids in the Navy's storm water runoff are exactly the finer-grained (silt and clay) solids that are largely not retained in the mouth of Chollas Creek. Roger et al. (1998) as cited in Pitt et al. (2004) {Pitt, R., D. Williamson, J. Voorhees and S. Clark. 2004. Review of historical street dust and dirt accumulation and washoff data. In *Effective Modeling of Urban Water Systems*, Monograph 13. W. James, K.N. Irvine, E.A. McBean and R.E. Pitt, eds.} showed that the majority of sediment transported by stormwater runoff from a roadway was less than 50  $\mu$ m in diameter. Li et al. (2005) {Li, Y., S.-L. Lau, M.Kayhanian, and M.K. Stenstrom. 2005. Particle size distribution in highway runoff. *Journal of Environmental Engineering*, September 2005: 1267-1276.} also report that particle sizes from paved roadways were generally in the 10-50  $\mu$ m diameter range. Although these studies are for roadways, they provide some indication as to expected particle sizes of stormwater-transported sediment that might be expected from paved or impervious surfaces and that these sediments are usually fine grained. Additionally, because the Navy's property is relatively flat lying (i.e., low slope) and therefore runoff would be lower-energy the runoff would be expected to suspend and transport predominantly fine particles. {Land in the Navy's property slopes between 0-1 degree based on information in Weston Solutions, 2006. Chollas Creek TMDL Source Loading, Best Management Practices and Monitoring Strategy Assessment. Final Report for City of San Diego, San Diego, CA. (Weston Solutions 2006; p. 47).} Alternatively, the steeper slopes (see Weston 2006; p. 47) in the upland portions of the Chollas Creek Watershed would tend to supply a larger and more significant proportion of any coarse grained sediments to Chollas Creek. It is also important to note that of the three Navy storm water outfalls in Chollas Creek, two are near the mouth of the creek, but one is located in the outer portion of Chollas Channel, well beyond (bayward of) the area of Chollas Creek where sediment trapping occurs.

While most sand-sized particles and some silt does settle out before reaching the Bay and the Site, the finer-grained particles, which carry most of the adsorbed COC load, do not. It is important to consider that most of the particles in the runoff from the Navy property are likely finer-grained than the storm water arriving from the Chollas Creek watershed. Furthermore, one of the three Navy storm water outfalls is located closer to the Bay and Site in the outer portion of the Chollas Channel. Because little trapping of the smaller particles that carry the adsorbed contaminants in storm water actually takes place in Chollas Creek, a reduction of the Navy's allocation is not appropriate. Attachment B, Exponent, Critique of the U.S. Navy's Apportionment Report (June 23, 2011) ("Apportionment Critique"), at 5.

In addition, the Navy relies on two storm events late in the rainy season, and not on early fall "first flush" rainfall events when the highest amount of accumulated contaminants from the dry season would flush into the Bay. It does not account for the intensity of the storm event, despite the fact that more powerful storms with higher rainfall rates can be expected to carry more contaminant-loaded particles from Chollas Creek further into the Bay, and to volatilize previously deposited contaminants from the mouth of Chollas Creek and push them further into the Bay.

From this flawed basis, the Navy calculates that its contribution to contaminant loadings at the Site would be less than 0.08%, "assuming that contaminants are distributed equally among the different particle sizes." Navy Comments, Appendix B, Apportionment Report at 19. Yet the assumption that contaminants are distributed equally among different particle sizes directly

contradicts the Navy's finding that because "smaller particles contain proportionally higher contaminant loads . . . contaminant loading from the creek to the [Site] is affected by dispersion and fate of the smaller suspended particles." *Id.* (emphasis added). Even before taking into account the flaws in Table 2 identified above, the Navy admits that 1% to 2.2% of the smallest particles (silt) are deposited at the Site during storm events. *Id.* In fact, this percentage should be higher.

Finally, the Navy's calculation that its contribution to contaminant loadings would be less than 0.08% can only be replicated with fuzzy math. To reach that calculation, the Navy assumes 8% responsibility for COC loading to Chollas Creek times 1% deposition rate of contaminated particles to the Site ( $0.08 * 0.01 = 0.0008$ , or 0.8%). Yet as described above, the Apportionment Report does not disturb the DTR's conclusion that the Navy's pollutant contributions to the mouth of Chollas Creek are "approximately 40% of the copper load, 2% of the lead load, and 18% of the zinc load" because the Navy relies on essentially the same COC estimate from Chollas Creek and has no competing data for hull and cathodic protection leaching. DTR at 10-90. So multiplying by 8% for all COCs dramatically understates the Navy's responsibility for copper and zinc, and, as also stated above, the 1% deposition rate for contaminated particles at the Site is skewed low due to the Navy's use of flawed data and unreasonable assumption that contaminants are distributed equally among the different particle sizes.

Furthermore, the Navy argues that that modeled patterns of contaminant transport show that concentration gradients decrease with distance away from the mouth of Chollas Creek and thus do not support the assertion that contamination from Chollas Creek is impacting sediment at the Site. This may be true for the sand-sized sediments that are deposited near the mouth and in the channel. However, Figure 11 of the Navy's report clearly shows transport and deposition of silt and clay, the most important size fractions with respect to COC transport, in the Site. For the same reasons noted above, a reduction of the Navy's allocation is not appropriate.

#### Spatial Gradients (Figure 12)

The Navy presents Figure 12 showing cadmium concentrations plotted against zinc concentrations, in other words the concentration ratios, for sediments from the Chollas Creek area and the Site. They argue that the ratios should be similar if the Chollas Creek sediments are a significant source of contaminants to the Site. The Navy's Figure 12 indeed shows that the plotted points for the Chollas Creek sediment and the Site sediment fall on different trend lines.

The Navy does not report exactly which data points were used in their analysis, or if they were analyses of surface or subsurface samples, except to say that the data are from SCCWRP and SPAWAR 2005 {Southern California Coastal Water Research Project (SCCWRP) and Space and Naval Warfare Systems Center, San Diego, U.S. Navy (SPAWAR). 2005. Sediment assessment study for the mouths of Chollas and Paleta Creek, San Diego. Phase 1 final report. May 2005.} and Exponent 2001 {The source of the Navy's data from "Exponent (2001)" is not clear. We do not have a record of this document as it is cited in the Navy's references. Additionally, this document (as cited by the Navy) is not found as a reference in the DTR. The closest document we have is Exponent. 2001. Technical Memorandum 1 Phase 1 sediment chemistry data for the NASSCO and Southwest Marine detailed sediment investigation. Prepared for NASSCO and Southwest Marine, October 2001.}. Similar plots are presented below from contemporaneous surface sediment samples.

Chollas Creek sediment samples {Stations C01-C14.} are from the top 2 cm, taken in July/Aug 2001 (SCCWRP and SPAWAR 2005). Site stations {Stations NA13, NA14, NA22,

NA25, NA30, and NA31.} data are from Exponent collected in 2001 and 2002. Figure 1 is a plot of cadmium and zinc concentrations similar to the Navy's Figure 12. However, these samples of surface sediment collected within a year of each other do not show a clear difference. The data points for Chollas and Site (NASSCO) samples show significant overlap in cadmium – zinc ratios, which indicates that Chollas Creek is indeed a source of COCs to the Site.

Figure 1 Metals ratios (cadmium and zinc) for sediments from Chollas Creek and Site.

A more relevant comparison is a comparison of copper and zinc ratios because they are both significant COCs in the Chollas Creek and the Site area, whereas cadmium is not as significant a COC. The ratios of copper and zinc are shown in Figure 2. In this case, copper – zinc ratios for Chollas Creek show a wide spread distribution. There is also significant overlap with the copper – zinc ratios for Site sediments which indicate, contrary to the Navy's argument, that Chollas Creek sediments are a source of copper and zinc to the Site.

Figure 2. Metals ratios (copper and zinc) for sediments from Chollas Creek and Site.

The Navy also notes that concentrations of copper and zinc are higher in Site sediments than in the Chollas Creek sediments. It states that this suggests that leachate from Navy vessels in the Chollas Creek region is not a significant source of copper and zinc in the Site sediments. This conclusion is misleading because even though the concentrations are higher in Site sediments this should not detract from the fact that there is a gradient of copper and zinc from the Chollas Creek sediments in the direction of the Site. Sources in the Chollas Creek area may not be the largest sources of copper and zinc to the Site sediment, but they are still a significant source.

Given the above, the Navy's contributions from the Navy 28th Street Landing Station ("28th Street") and storm water discharges to Chollas Creek are not "negligible," as the Navy argues. The Navy's apportionment determined in the TCAO should not be reduced. Attachment B, Apportionment Critique, at 9.

[NASSCO Comment No. 348, TCAO, at ¶ 10, DTR, at § 10]

**Comment ID:** 375

**Organization:** NASSCO

**DTR Section:** 10

**Comment:**

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U.S. Navy Comment No. 2: The RWQCB's allegation that historical Navy operations at the 28th Street Mole Pier contributed to the contamination at the Shipyard Sediment Site is unfounded, and the Navy's 2004 comment submission on this subject incorrectly assumed that shipyard operations were part of the Navy leasehold.

The Historical Document Review submitted by the Navy does not provide any evidence that the Navy's activities at the NASSCO leasehold did not result in discharges of contaminants of concern to the Site. Accordingly, it does not serve as a basis for rebutting DTR Findings 10.4.2, 10.6, and 10.10.

The principle finding in the Historical Document Review is that “[t]he 2004 Navy Technical Report (Navy 2004) had previously associated many of the activities in the shipbuilding area with the Navy operated 28th Street Shore Boat Landing facility. However, this review indicates that these facilities were operated by the Lynch Shipbuilding Company and later by National Marine Terminal Incorporated.” Navy Comments, Appendix A, Navy Historical Document Review, at 5-1.

Yet this conclusion does not contradict the findings in the DTR, which states that the “U.S. Navy concluded that the industrial activities it conducted on NASSCO’s present day leasehold were limited to maintenance of small boat launches,” and that the “U.S. Navy acknowledged the possibility that discharges from their boat launch maintenance operations on the north side of 28th Street Pier to the Shipyard Sediment Site may have occurred.” DTR at 10-12. This is so because the Navy does not dispute that it operated a small boat launch facility at 28th Street, and the Historical Document Review does not present any evidence that contradicts the DTR’s finding that discharges from those operations to the Shipyard Sediment Site may have occurred.

The Navy Apportionment Report also includes an analysis of the contribution of the Navy’s facilities at 28th Street. The Navy presents historical evidence to clarify the extent of Navy facilities at that time. However, faced with a general lack of data, the Navy falls back to estimating its contribution from 28th Street based on the surface areas and periods of operation of the BAE, NASSCO, and 28th Street. The surface areas and periods of operation were multiplied by the Navy to obtain acre-years for each facility and then calculate the percentage of the total acre-years for each facility, which becomes the allocation that each facility.

This approach is completely irrelevant to contaminants in sediments near 28th Street because it presumes that all storm water-related COCs, derived from surface runoff, from the entire surfaces of the BAE and NASSCO facilities contributed to the small area near 28th Street (near the two sediment core locations), which they did not. Even if this were appropriate, the Navy biases the result further by limiting its area of contribution to just 28th Street (one acre) and disregarding the area of the rest of the NBSD. Finally, consideration of storm water runoff only from surfaces ignores inputs from historical point sources that were likely much more significant before implementation of both federal and state clean water point source permitting programs under the Clean Water Act and Porter-Cologne Act. Accordingly, the Navy’s conclusion regarding its historical contribution from 28th Street is not credible and should not be considered. Attachment B, Apportionment Critique, at 3.

[NASSCO Comment No. 349, TCAO, at ¶ 10, DTR, at § 10]

**Comment ID:** 376

**Organization:** NASSCO

**DTR Section:** 4

**Comment:**

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City Comment No. 1.0: Studies cited in DTR Section 4.3.1 do not support the DTR’s statements regarding Chollas Creek’s influence on the chemicals of concern in shipyard sediments.

The City alleges that the Schiff, 2003 {Schiff, K., S. Bay and D. Diehl, 2003. Stormwater Toxicity in Chollas Creek and San Diego Bay, California. Environmental Monitoring and Assessment 81: 119-132, 2003. 2003 Kluwer Academic Publishers. Printed in the Netherlands.}, Chadwick, 1999 {Chadwick B., J. Leather, K. Richter, S. Apitz, D. Lapota, D. Duckworth, C.

Katz, V. Kirtay, B. Davidson, A., Patterson, P. Wang, S. Curtis, G. Key, S. Steinert, G. Rosen, M. Caballero, J. Groves, G. Koon, A Valkirs, K., Meyers-Schulte, M. Stallard, S. Clawson, R. Streib Montee, D. Sutton, L. Skinner, J. Germano, and R. Cheng. 1999. Sediment Quality Characterization - Naval Station San Diego Final Summary Report. U.S. Navy Technical Report 1777.} , and Katz, 2003 [sic]{The resource the City is commenting on was actually generated in 2004. See Katz, C.N., Carlson-Blake, A. and Chadwick, D.B. 2004. Poster: Spatial and Temporal Evolution of Stormwater Plumes Impacting San Diego Bay. U.S. Navy, Marine Environmental Quality Branch, SPAWAR, San Diego, CA.} studies provide insufficient support for the allegations in the DTR § 4.3.1 that Chollas Creek impacts COCs at the Site because the studies did not provide their underlying data. City Comments, Comment No. 1.0 at 1. Yet the City has claimed no attempt to contact the authors of the studies to obtain the data they needed, despite the fact that the April 2008 DTR cited the same studies. See DTR (April 4, 2008), at 4-3. The City also speculates, without basis, that the Katz, 2003 study, which was prepared by a Navy entity, could be biased because the Navy is a party. City Comments, Comment No. 1.0 at 2. This type of speculation ignores that it is extremely common for potentially liable parties to prepare scientific and engineering studies for use by regulatory agencies in making determinations about remediation, and if given credence, would call into question virtually the entire body of environmental science. Furthermore, the City’s comments implicitly recognize that those three studies cited support the conclusion that Chollas Creek impacts the NASSCO site.

[NASSCO Comment No. 350, TCAO, at ¶ 4, DTR, at § 4]

**Comment ID:** 377

**Organization:** NASSCO

**DTR Section:** 4.7

**Comment:**

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City Comment No. 1.1: Purple sea urchin fertilization tests (Schiff 2003) cited at DTR Section 4.7.1.3 do not support the conclusion that Chollas Creek has contributed toxic effects or constituents of concerns to the site sediments.

Comment No. 1.1 argues that Schiff, 2003 does not stand for the proposition that COCs are transported on storm water plumes from Chollas Creek to the Site. City Comments, Comment No. 1.1 at 4. First, it is important to note that storm water plumes from Chollas Creek are known to reach well into the inner shipyard at NASSCO, including polygons slated for remediation. Attachment C, Declaration of T. Michael Chee In Support of NASSCO’s Response to Comments on Tentative Cleanup and Abatement Order No. R9-2011-0001 (“Chee Dec.”) Second, It is true that Schiff, 2003 notes that observed storm water plumes “formed relatively thin lenses 1 to 3 m, floating on top of the more dense bay water.” Id., quoting Schiff, 2003. However, the City’s logical jump from this observation to a conclusion that Schiff, 2003 cannot stand as evidence that COCs are transported to the sediment of the Site has no merit because how the thick the storm water plume was does not say anything about whether contaminated sediment in the plume settled out of the plume and down into the Site sediments.

[NASSCO Comment No. 351, TCAO, at ¶ 4, DTR, at § 4.7]



**Comment ID:** 378

**Organization:** NASSCO

**DTR Section:** 4.7

**Comment:**

City Comment No. 1.2: The DTR's reliance on Schiff (2003) is misplaced, as the Schiff (2003) plume studies are not supported by adequate data, do not take into account the hydrodynamic processes that affect the fate and transport of sediments from Chollas Creek into San Deigo [sic] Bay, and therefore overstate toxicity in the Chollas freshwater plume.

The same type of speculation seen in City Comment 1.0 can be seen in Comment No. 1.2 (Schiff, 2003 plume maps "are not likely based directly on any data collected" from the shoreline, although "it is impossible to review since [sampling] locations are not provided"), and Comment No. 1.3 ("Doppler meters used to calibrate the hydrodynamic model [for Chadwick, 1999] were most likely placed outside of piers and probably could not show the effects of the piers on waters between them"). City Comments, Comment No. 1.2 at 5 (emphasis added); Comment No. 1.3 at 6 (emphasis added); Without more, the City's speculative comments do not constitute substantial evidence.

[NASSCO Comment No. 352, TCAO, at ¶ 4, DTR, at § 4.7]

**Comment ID:** 379

**Organization:** NASSCO

**DTR Section:** 4.7

**Comment:**

City Comment No. 1.3: The hydrodynamic model reported in Chadwick (1999) lacks important information influencing fate and transport and therefore may be overstating impacts from Chollas Creek.

See NASSCO's Comment No. 352, Reply to City Comment No. 1.2. The City also complains that hydrodynamic modeling in Chadwick 1999 could have been better, principally because the study modeled Chollas Creek discharges during storm events using a half sine wave function, but creek discharges could be longer than one-half tidal cycles. City Comments, Comment No. 1.3 at 7. Even if this is true (the City provides no evidence for the point that storm events commonly last longer than one-half tidal cycles), the City provides no more sophisticated model itself, and has not shown that any potential inaccuracies would critically impair the Regional Board's reliance on Chadwick 1999.

[NASSCO Comment No. 353, TCAO, at ¶ 4, DTR, at § 4.7]

**Comment ID:** 380

**Organization:** NASSCO

**DTR Section:** 4.7, 30

**Comment:**

City Comment No. 1.4: Measured Chollas Creek discharge data as referenced in Katz (2003) are insufficient for drawing conclusions that Chollas discharges have significantly impacted shipyard sediments.

The City states that measured Chollas Creek discharge data as referenced in Katz, 2003 are insufficient for drawing conclusions that Chollas Creek discharges have significantly impacted shipyard sediment. To support its comment, the City points out that COC loadings were measured at two points on Chollas Creek on a flow-weighted basis, while COC loadings from the three stormwater outfalls on the Navy's property adjacent to Chollas Creek were collected on a time-proportional basis. The City concludes that because of this difference, comparisons of concentrations or mass loading should not be made.

It is important to note that the City's criticism does not affect one's ability to draw conclusions regarding the impact of Chollas Creek discharges on shipyard sediments. The poster prepared by Katz, 2003 also presents data in Figure 5 that characterize the plume emanating from Chollas Creek toward the Shipyard Site. It is this plume that potentially affects shipyard sediments. The City does not comment on this aspect of the Katz, 2003 poster. Accordingly, the City's comment has no merit with respect to conclusions of impact of Chollas Creek on the Shipyard Site. Attachment A, Exponent Critique, at 9.

[NASSCO Comment No. 354, TCAO, at ¶¶ 4, 30 DTR, at §§ 4.7, 30]

**Comment ID:** 381

**Organization:** NASSCO

**DTR Section:** 4.4, 4.7, 30

**Comment:**

City Comment No. 2.0: The DTR's conclusions that discharges from SW9 have contributed to elevated levels of constituents of concern observed in shipyard sediments are not supported by adequate data.

Comment Nos. 2.0 and 3.0 contend that the DTR lacks "reliable data" to assert that the City is discharging COCs through storm water outfalls SW4 and SW9. City Comments, Comment Nos. 2.0 and 3.0 at 10-14. The City bases this claim on the fact that there is no monitoring data available from either SW4 or SW9 to indicate specific quantities of COCs in the runoff. Id.

As noted in the DTR, urban runoff itself is classified as a "waste" under the California Water Code § 13050(d). DTR at 11-8; see also Cal. Water Code §§ 13392 (State and Regional Boards to coordinate with Departments of Public Health and Fish & Game to develop "new programs to reduce urban and agricultural runoff"); 13396.7(a) (commissioning a study to determine adverse health effects of urban runoff on swimmers at urban beaches). In fact, the DTR includes substantial evidence that urban runoff in San Diego contains COCs at the Site, including "total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash." DTR at 11-8; see also 4-10 (San Diego County Municipal Copermittees 2002-2003 Urban Runoff Monitoring Final Report submitted by the City indicating that "elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay").

Furthermore, the DTR demonstrates that samples taken in the SW4 catch basin, and laterals entering the catch basin, "indicate the presence of both PCBs and PAHs entering and exiting the

municipal storm drain system catch basin . . . .” DTR at 4-16. Far from suffering from a lack of evidence, the DTR has presented substantial evidence that San Diego urban runoff contains relevant COCs, but simply did not take the extra step to quantify the amount of COCs that actually are present in storm water flows as they exit the SW4 and SW9 outfalls.

Notably, the City’s comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the City presents no affirmative evidence to show that they do not. Instead, the City attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

Finally, as also noted in the DTR, “[i]n the absence of such direct evidence, the San Diego Water Board may consider relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304.” DTR at 10-13, citing State Resolution 92-49, § I.A (directing the Regional Boards to use “any relevant evidence, whether direct or circumstantial”, when determining whether a party should be required to investigate or cleanup a discharge of waste). Accordingly, even if storm water sampling data from SW4 and SW9 is unavailable, it is proper for the Regional Board to consider and rely on other direct and circumstantial evidence that leads to the conclusion that the City’s storm water discharges have contaminated the NASSCO shipyard.

[NASSCO Comment No. 355, TCAO, at ¶¶ 4, 30 DTR, at §§ 4.4, 4.7, 30]

**Comment ID:** 382

**Organization:** NASSCO

**DTR Section:** 4.4, 4.7, 30

**Comment:**

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City Comment No. 3.0: There are no data indicating that SW4 has contributed significantly to elevated levels of constituents of concern observed in shipyard sediments.

See NASSCO’S Comment No. 355, Reply to City Comment No. 2.0.

[NASSCO Comment No. 356, TCAO, at ¶¶ 4, 30 DTR, at §§ 4.4, 4.7, 30]

**Comment ID:** 383

**Organization:** NASSCO

**DTR Section:** 14-19

**Comment:**

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SDG&E Comment No. 1.1: DTR’s Benthic beneficial use impairment is critically flawed and should be replaced with a causal approach to adequately identify risk.

SDG&E advocates replacing the triad study with a putative “causal” and self-serving approach to benthic risk evaluation proposed by SDG&E’s expert witness, Jason Conder. While it is true that a Triad study cannot, by itself, establish specific chemical causality of observed adverse effects on benthic organisms, a Triad study that demonstrates the absence of adverse effects as a function of exposure to sediment chemicals is clear indication that there is no causal linkage between any measured chemical contamination and benthic impacts, at the exposure levels observed. Attachment A, Exponent Critique, at 10.

The alternative aquatic life BUI analysis put forward by Dr. Conder in the subject memorandum is based on a novel method of analysis proposed in his expert report critiquing the DTR aquatic life beneficial use impairment (BUI) assessment, submitted earlier this year (Conder 2011). However, the proposal currently being reviewed goes well beyond the original application and conclusions reached by Conder (2011). Conder (2011) re-evaluated the DTR findings of impaired benthic community at the Shipyard Site, and concluded that a much smaller remedial footprint was justified than that proposed in the DTR (Conder 2011, Figure 3). In contrast, the present analysis by Conder is a de novo re-assessment of benthic BUI for the entire Shipyard Site, and concludes that a remedial footprint much larger than the one proposed in the DTR is warranted based solely on benthic BUI (see subject memorandum, Figure 3). While the scope of the current analysis is clearly different from the one contained in Conder (2011), the discrepancy between the two sets of recommendations with regard to remediation is not explained or justified in any way.

Furthermore, the theoretical approach advocated in the comment does not establish the site-specific causality that is suggested to be necessary, because it does not evaluate the presence of a site-specific exposure-response relationship or of co-occurrence of exposure with adverse effects. *Id.* Rather, the toxic unit approach infers causality at the Site from a theoretical equilibrium model of exposure, combined with an assumed causal relationship developed from laboratory exposure data collected to assess water column toxicity rather than sediment toxicity. *Id.* As a result, the proposed alternative approach would ignore available site-specific information about the presence or absence of an exposure-response relationship at the Site, and would rely instead on a theoretical causal relationship that may not be relevant under conditions or to receptors found at the Site. *Id.* Proper interpretation of synoptic chemistry data, sediment toxicity testing (using three different organisms), and benthic community analysis are a far better basis from which to infer causality than a simple comparison of Site chemistry data to literature benchmarks for aqueous toxicity. *Id.* Furthermore, the comment ignores the fact that a site-specific causal assessment metric, the apparent effects threshold (AET), was developed from the Triad study data and incorporated into the DTR approach for non-Triad stations (see response to comment no. 3 below). *Id.*

In summary, the proposed alternative approach would do nothing to improve understanding of causality in the assessment of benthic impacts at the Shipyard Site, and would in fact be misleading and inferior to the DTR approach in this regard. *Id.* The alternative approach advocated would, at most, be appropriate only as a screening tool for potential BUI if Site-specific biological information was unavailable. *Id.* Any characterization of aquatic life BUI based on the proposed alternative approach would be seriously flawed, and unnecessary, since extensive site-specific biological information exists for the Site. *Id.*

[NASSCO Comment No. 357, TCAO, at ¶ 14-19, DTR, at §§ 14-19]

**Comment ID:** 384

**Organization:** NASSCO

**DTR Section:** 16, 18, Appendix 18

**Comment:**

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SDG&E Comment No. 1.2: Triad approach flawed as it lacks scientifically valid consideration of COCs.

This comment is erroneous and invalid. SDG&E claims that the toxic unit approach is scientifically superior to the SQGQ1 chemistry evaluation solely because it includes TBT. However, SDG&E blatantly ignores existing site specific information and previous analyses showing that there is no exposure-response relationship between TBT in sediments or pore water and adverse effects. *Id.* The comment mischaracterizes the significance of TBT as a risk driver at the Shipyard Site, and fails to mention the extensive consideration and evaluation of TBT that has taken place during the last decade of assessment of sediment chemicals at the Shipyard Site. In fact, the possibility of an exposure-response relationship for TBT in both sediment and pore water was specifically investigated and addressed during the Detailed Sediment Investigation, and the lack of such a relationship for TBT is well-documented in the public record. Across the range of TBT concentrations measured in sediments at the 30 Sitewide Triad stations (38 - 3,250 µg/kg), there are no significant correlations between sediment concentration and toxicity from any of the three tests performed, or total abundance or species richness. Exponent Report, at Table 9-1. Furthermore, the relationship between sediment TBT levels and pore water TBT levels, while significant, is non-linear, a finding that contradicts the fundamental assumptions of the equilibrium partitioning model upon which the proposed toxic unit assessment approach for pore water is based. Exponent Report, at 5-4. In addition, the regressions of pore water and sediment concentrations for most other primary COCs (copper, mercury, and PCBs) were found to have positive y-intercepts, indicating that those substances would be expected to be found in pore water, even if absent in sediment. Attachment A, Exponent Critique, at 11. This finding also contradicts the assumption of thermodynamic equilibrium, indicating that an equilibrium partitioning approach to estimate concentrations of these substances in pore water is inappropriate at the Shipyard Site, and will yield incorrect results. *Id.*

Other fundamental assumptions of SDG&E's toxic units approach are contradicted and revealed to be false by Site-specific empirical data. This is readily apparent in the poor predictive performance of the toxic unit calculations themselves. The SDG&E alternative chemistry analysis, as summarized in Table 19, predicts toxicity to benthic organisms at nine Triad stations (of 30 total) where sediments were tested and found to be non-toxic in all three of the standard bioassays performed: NA04, NA05, NA06, NA15, NA17, SW08, SW09, SW18, SW21. Furthermore, no evidence of benthic community disturbance was found at any of these nine stations. With a false positive rate of 30 percent, it is difficult to defend the relevance of the toxicity unit thresholds to the Site, let alone justify claims that the method is a rigorously causal approach. *Id.*

An examination of the toxicological basis of the putative risk-driving benchmarks in the alternative assessment further reveals the lack of relevance and poor scientific justification for selection of these thresholds as sediment toxicity benchmarks. The threshold values for copper and TBT, the two substances that drive the toxic unit method's erroneous predictions of widespread toxicity in Shipyard sediments, are both ambient water quality final chronic values (FCV), developed by U.S. EPA for assessment of toxicity to aquatic organisms living in the water column. Ambient water quality values in general have no direct relevance to pore water concentrations, only surface water concentrations. Attachment A, Exponent Critique at 12. Even most burrowing benthic infauna actively irrigate their burrows with overlying surface water, and are not continually immersed in pore water. *Id.* The very reliance on toxicity data from aquatic immersion exposures presumes that exposure is primarily driven by passive diffusion from sediment to pore water to organisms, a poor assumption for sediment exposure. *Id.* Given that the sediments and pore water at the Shipyard Site are generally not in equilibrium

(see discussion above), active pathways such as dietary exposure and direct contact are likely to be more important than passive diffusion, and these pathways are heavily dependent on bioavailability of sediment constituents (a consideration the toxic units approach completely ignores). *Id.*

Finally, the data upon which saltwater FCV criteria are based are primarily from acute toxicity tests of water column species (adjusted downward to estimate chronic values), and may not have high relevance to benthic invertebrate species. *Id.* For example, the three most sensitive species driving the TBT FCV calculation are mysid shrimp, copepods, and Chinook salmon, all water column species that poorly represent the benthic community at the Shipyards (see USEPA 2003, Table 3). *Id.* For all of these reasons, the use of a generic water column exposure benchmark is inferior to the use of thresholds derived from Site-specific sediment exposure bioassays that more accurately reflect Site exposure conditions and pathways (i.e., AETs). *Id.*

In summary, SDG&E's proposed alternative assessment method is scientifically flawed and clearly inferior to the DTR approach, notwithstanding the repeated claims to the contrary made in SDG&E's comments. Under SDG&E's proposal, tenuous, theoretical relationships are misrepresented as factual, even though readily available Site-specific data prove that key basic assumptions upon which they are based are scientifically invalid. *Id.* These erroneous assumptions include:

- Exposure-response relationships exist for primary COCs in sediments and sediment toxicity at the Shipyard Site
- Sediments are at equilibrium with pore water at the Shipyard Site
- Equilibrium partitioning accurately predicts pore water concentrations at the Shipyard Site
- Exposure to pore water is continuous and is the most important pathway of exposure for benthic organisms
- Selected literature benchmarks of aquatic toxicity accurately predict benthic toxicity of Shipyard sediments when compared to estimated or measured pore water concentrations

*Id.*

[NASSCO Comment No. 358, TCAO, at ¶ 16, 18, DTR, at §§ 16, 18, Appendix 18]

**Comment ID:** 385

**Organization:** NASSCO

**DTR Section:** 32, Appendix 32

**Comment:**

SDG&E Comment No. 1.3: Non-triad approach fails to address causal connection between COCs and Benthic risk and 60% is arbitrary and without scientific support.

This comment is erroneous and invalid. The metrics comprising the non-triad approach provide valuable causal information, and are scientifically supported. Attachment A, Exponent Critique at 13.

The AET is a direct causal metric that relates individual sediment contaminant exposure to statistically meaningful adverse effects. *Id.* Under the DTR approach, causal relationships were developed between COC exposure and seven separate empirical measures of adverse effects on

benthic macroinvertebrates: amphipod survival, echinoderm fertilization, bivalve larval development, total abundance, number of taxa present, benthic response index (BRI), and Shannon-Weiner diversity index. As a highly protective, site-specific benchmark of exposure, the lowest adverse effect threshold (LAET) was selected from this suite of seven effects, and a 40 percent safety factor was added to result in the 60% LAET value. Although the AET does not, by itself, prove causality, it provides valuable site-specific causal information on individual substances. *Id.* The AET is both chemical-specific, and entirely reliant on site-specific empirical data. Accordingly, use of the AET provides unequivocal evidence that exposure for that specific substance at that sediment concentration does not cause adverse effects. *Id.*

Furthermore, the SS-MEQ is an integrated index of multiple chemical exposure that quantitatively relates exposure at any non-Triad station to the exposure level at which evidence of impairment was observed in the Triad stations. *Id.* While chemical causality can only be inferred from the SS-MEQ analysis rather than measured directly, the same is true of the toxic unit method's reliance on literature effect thresholds, and the SS-MEQ has the advantage of being based on Site-specific data, for multiple lines of evidence. *Id.* The proposed alternative approach would substitute a generic, theoretical causal assessment approach for an empirical, site-specific causal assessment approach, resulting in an inferior aquatic life BUI assessment. *Id.*

With regard to the proposed toxic unit assessment approach, SDG&E claims to incorporate a causal analysis, and concludes erroneously that there is a causal relationship of theoretical benthic effects with TBT. However, SDG&E's analysis does not follow any identifiable causal analysis framework, and instead relies on a purely theoretical analysis of causal relationships based on water quality criteria and theoretical sediment pore water concentrations. *Id.* SDG&E's analysis therefore erroneously prioritizes tenuous theoretical relationships over both site-specific empirical data on measured concentrations of substances, and multiple lines of evidence of effects that use actual biological data for the site. *Id.*

Given the above, SDG&E appears to be unaware of criteria for determining causation, and the use of these criteria in causal analysis frameworks that are available in the scientific literature. Authors from EPA have recently summarized available information on causal analyses and recommended a framework to ensure that the Agency's approach is appropriate and defensible (Suter et al., 2010) {Suter, G.W., Norton, S.B., and S.M. Cormier. 2010. The Science and Philosophy of a Method for Assessing Environmental Causes. *Human and Ecol. Risk Assess.* 16: 19–34}. Key steps in the process include a clear identification of alternative causes, and an identification of the strength of evidence for each of the alternative causes. Important causal evidence for a site study includes:

- Spatial/temporal co-occurrence of measured biological effects with candidate stressors
- Stressor response relationships that document an increasing level of effect with increasing exposure to the candidate substance
- Field and Laboratory experiments that increase or decrease exposure and measure biological response

The authors stress the importance of including all potential applicable methods for causal analysis into a consistent framework. See also, Attachment A, Exponent Critique, at 13-14.

All of the aforementioned evidence for causality was available as part of the shipyard sediment studies using a Triad approach. Notwithstanding this evidence, SDG&E embarked on a independent assessment of causation using a novel theoretical approach that ignores all of the

other available data. This represents a scientifically flawed assessment that is inconsistent with the current standards of practice in environmental investigations and frameworks established by the U.S. EPA and published in the available scientific literature.

[NASSCO Comment No. 359, TCAO, at ¶ 32, DTR, at § 32, Appendix 32]

**Comment ID:** 386

**Organization:** NASSCO

**DTR Section:** 32, Appendix 32

**Comment:**

SDG&E Comment No. 1.4: The Toxic Unit approach used to derive the proposed footprint shown in Figure 1 is superior to the SQG-based evaluation used in part to identify polygons for remediation by MacDonald (2009, 2011) because the latter approach relies on empirical SQGs that suffer from the same weaknesses as the SQGQ1, SS-MEQ, and 60% LAET approaches (lack of chemical causality between concentrations and effects). The Toxic Unit approach is also a more scientifically-rigorous chemical line of evidence than the approach Spadaro et al. (2011) used to derive an alternate footprint to address Aquatic Life BUI in the BAE portion of the Site.

This comment is invalid, as described in NASSCO's Response to SDG&E Comment No. 3. A standard tenet of environmental Site assessment is that Site-specific empirical data are more reliable and preferred for remedial decision-making purposes than use of generic benchmarks, and should be preferentially used for site characterization. Attachment A, Exponent Critique, at 14 (citing USEPA 1989, USEPA1997). The toxic unit approach is not Site-specific, and is therefore far less scientifically valid than the DTR approach, which relies on both direct causal analysis and inferences drawn from empirical Site-specific observation to establish the presence or absence of biological impacts and causality with regard to aquatic life BUI. *Id.* The toxic units approach relies completely on theoretical exposure estimates and generic benchmarks, and is little more than a screening approach. *Id.*

[NASSCO Comment No. 360, TCAO, at ¶ 32, DTR, at § 32, Appendix 32]

**Comment ID:** 387

**Organization:** NASSCO

**DTR Section:** 18, 32, 33, Appendices 18, 32, 33

**Comment:**

SDG&E Comment No. 1.5: [T]he Toxic Unit approach detailed in Conder (2011a) is considered to be a more scientifically defensible sediment chemistry-only approach compared to the SS-MEQ and 60% LAET evaluation. It also includes all five relevant primary Site COCs, in contrast to the Triad sediment chemistry line of evidence, which omits TBT. The Toxic Unit approach should be adopted for use in sediment chemistry line of evidence approaches for the CRWQCB (2010) Triad and Non-Triad Data approaches, and thus should be used for deriving a remedial footprint in conjunction with other considerations regarding technical and economic feasibility in a manner consistent with the approaches discussed in CRWQCB (2010).

Whereas the toxic unit approach is, in fact, a chemistry-only assessment approach, the same is not true of the DTR non-Triad station assessment. The LAET is a direct function of the empirical exposure-response relationship for individual COCs, and the SS-MEQ is correlated



with a state of apparent impairment determined by a multiple line of evidence assessment of aquatic life BUI. Attachment A, Exponent Critique at 14-15. Unlike the toxic unit approach, both DTR metrics incorporate site-specific measurements of sediment toxicity and benthic community disturbance, and therefore incorporate critical Site-specific elements of exposure, such as bioavailability of COCs in sediments. Attachment A, Exponent Critique at 15.

Furthermore, the toxic unit approach relies on an implicit assumption that SDG&E does not acknowledge or test, even though it is readily testable. The approach presumes that there is a measureable exposure-response relationship between sediment or pore water contaminant levels and adverse effects on benthic organisms under Site conditions. Such a presumption may be reasonable for screening chemistry data in the absence of Site-specific biological data, but not at a Site where a Triad study has been performed. *Id.* At this Site, whether or not an exposure-response relationship exists for any sediment chemical can actually be determined. As Table 9-1 from the Exponent Report shows, none of the primary COC concentrations in sediments, are significantly correlated with any adverse effect. Note that this kind of analysis is one of the key criteria used in the EPA analysis of causation (Suter et al., 2010), which was ignored by SDG&E.

While the alternative remedial proposal put forward by SDG&E includes elimination of some polygons from the remedial footprint on the basis of a lack of BUI for humans and aquatic dependent wildlife receptors, seven additional polygons are added to the DTR footprint, due to alleged benthic BUI. A station-by-station review of the Site-specific data available for these polygons illustrates the lack of scientific validity in the SDG&E aquatic life BUI assessment. *Id.* Station NA10:

Based on relatively low chemistry, and a lack of evidence for benthic impacts, NA10 was properly excluded from the proposed remedial footprint in the DTR.

- Primary COCs are relatively low:
  - Composite SWAC ranking = 54 of 66 polygons
  - Copper (160 mg/kg) ranking = 48 of 66 polygons
  - Mercury (0.58 mg/kg) ranking = 51 of 66 polygons
  - HPAH (1,800 µg/kg) ranking = 54 of 66 polygons
  - PCB (160 µg/kg) ranking = 54 of 66 polygons
  - TBT (91 µg/kg) ranking = 44 of 66 polygons
  
- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs
  - SS-MEQ = 0.35
  
- No direct evidence of impacts to benthic community:
  - Non-Triad Station
  - SPI data indicate Stage III successional stage present.

Attachment A, Exponent Critique at 15

Station NA11:

There are no highly elevated COPC levels at this station. There are no clear impacts to the benthic community. None of the four benthic community indicators evaluated is significantly

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different from reference conditions. Only one of the three toxicity tests (amphipod survival) was slightly lower than reference. Due to a lack of high chemistry and no clear indication of benthic impacts, NA11 was properly excluded from the proposed remedial footprint in the DTR.

- Primary COCs are relatively low:

- Composite SWAC ranking = 49 of 66 polygons
- Copper (180 mg/kg) ranking = 43 of 66 polygons
- Mercury (0.85 mg/kg) ranking = 34 of 66 polygons
- HPAH (2,800 µg/kg) ranking = 44 of 66 polygons
- PCB (190 µg/kg) ranking = 45 of 66 polygons
- TBT (38 µg/kg) ranking = 56 of 66 polygons

- Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.42

- No clear indication of impacts to benthic community:

- Triad Station: "Possible" benthic impacts

- DTR chemistry score = moderate

SQGQ1 is less than 1.0. Only 1 chemical exceeds both DTR SQG and UPL.

- DTR toxicity score = moderate

Amphipod test scored slightly below reference LPL. Bivalve and urchin tests scored above reference LPLs.

- DTR benthic disturbance score = low

No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.

- SPI data indicate Stage I and III successional stages present.

Attachment A, Exponent Critique at 15-16.

Station NA18:

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA18 was properly excluded from the proposed remedial footprint in the DTR.

- Primary COCs are relatively low:

- Composite SWAC ranking = 39 of 66 polygons
- Copper (230 mg/kg) ranking = 31 of 66 polygons
- Mercury (0.79 mg/kg) ranking = 37 of 66 polygons
- HPAH (2,400 µg/kg) ranking = 49 of 66 polygons
- PCB (350 µg/kg) ranking = 32 of 66 polygons
- TBT (210 µg/kg) ranking = 19 of 66 polygons

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- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs
  - SS-MEQ = 0.56
- No direct evidence of impacts to benthic community:
  - Non-Triad station
  - No SPI data

Attachment A, Exponent Critique at 16.

Station NA21:

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA21 was properly excluded from the proposed remedial footprint in the DTR.

- Only TBT is relatively high:
  - Composite SWAC ranking = 41 of 66 polygons
  - Copper (150 mg/kg) ranking = 50 of 66 polygons
  - Mercury (0.51 mg/kg) ranking = 58 of 66 polygons
  - HPAH (2,100 µg/kg) ranking = 50 of 66 polygons
  - PCB (177 µg/kg) ranking = 51 of 66 polygons
  - TBT (410 µg/kg) ranking = 12 of 66 polygons
- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs (including TBT)
  - SS-MEQ = 0.50
- No direct evidence of impacts to benthic community:
  - Non-Triad Station
  - No SPI data

Attachment A, Exponent Critique at 17.

Station NA27:

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA27 was properly excluded from the proposed remedial footprint in the DTR.

- Primary COCs are relatively low:
  - Composite SWAC ranking = 36 of 66 polygons
  - Copper (390 mg/kg) ranking = 10 of 66 polygons
  - Mercury (1.20 mg/kg) ranking = 10 of 66 polygons
  - HPAH (2,800 µg/kg) ranking = 44 of 66 polygons
  - PCB (210 µg/kg) ranking = 40 of 66 polygons
  - TBT (100 µg/kg) ranking = 42 of 66 polygons
- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs

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-SS-MEQ = 0.69

- No direct evidence of impacts to benthic community:
  - Non-Triad Station
  - No SPI data

Attachment A, Exponent Critique at 17.

Station NA28:

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA28 was properly excluded from the proposed remedial footprint in the DTR.

- Primary COCs are relatively low:
  - Composite SWAC ranking = 42 of 66 polygons
  - Copper (290 mg/kg) ranking = 14 of 66 polygons
  - Mercury (0.89 mg/kg) ranking = 31 of 66 polygons
  - HPAH (3,400 µg/kg) ranking = 36 of 66 polygons
  - PCB (180 µg/kg) ranking = 47 of 66 polygons
  - TBT (90 µg/kg) ranking = 45 of 66 polygons
- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs
  - SS-MEQ = 0.55
- No direct evidence of impacts to benthic community:
  - Non-Triad Station
  - No SPI data

Attachment A, Exponent Critique at 17-18.

Station SW34:

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA28 was properly excluded from the proposed remedial footprint in the DTR.

- Only copper is relatively high:
  - Composite SWAC ranking = 48 of 66 polygons
  - Copper (320 mg/kg) ranking = 12 of 66 polygons
  - Mercury (0.75 mg/kg) ranking = 40 of 66 polygons
  - HPAH (1,400 µg/kg) ranking = 57 of 66 polygons
  - PCB (130 µg/kg) ranking = 58 of 66 polygons
  - TBT (38 µg/kg) ranking = 56 of 66 polygons
- Chemistry is below conservative biological benchmarks:
  - No exceedances of 60% LAETs (including copper)
  - SS-MEQ = 0.55

- No direct evidence of impacts to benthic community:
  - Non-Triad Station
  - No SPI data

Attachment A, Exponent Critique at 18.

In summary, the Site-specific data do not support the allegation that any of the seven additional polygons proposed for remediation by SDG&E exhibit aquatic life BUI or should be remediated. Id.

[NASSCO Comment No. 361, TCAO, at ¶¶ 18, 32, 33, DTR, at §§ 18, 32, 33, Appendices 18, 32, 33]

**Comment ID:** 388

**Organization:** NASSCO

**DTR Section:** 31, Appendix 31

**Comment:**

SDG&E Comment No. 2.0: DTR's Section 31 economic feasibility analysis fails to consider costs to reduction in Benthic risk exposure and should be revised.

The comment correctly notes that the DTR economic feasibility analysis measured benefit based on exposure reduction for receptors that average exposure over the entire site. However, it must be noted that benefits to the benthic community must be assessed on a point by point basis, and cannot be represented by an area weighted average concentration metric. Attachment A, Exponent Critique, at 18. The remedy proposed in the DTR directly addressed all areas identified as likely to impact aquatic life due to sediment contamination. No areas of likely benthic impacts were omitted from the DTR remediation footprint due to economic feasibility concerns.

[NASSCO Comment No. 362, TCAO, at ¶ 31, DTR, at § 31, Appendix 31]

**Comment ID:** 389

**Organization:** NASSCO

**DTR Section:** 18, 31, 32, Appendix 31

**Comment:**

SDG&E Comment No. 2.2, 2.3 : A revised economic feasibility analysis is shown in Figure 2, based on calculations shown in Tables 20 and 21. In this revised economic feasibility analysis, the percent exposure reduction for all three BUIs is considered via calculation of a composite percent exposure reduction based on SWACs for aquatic-dependent wildlife and human health (as in CRWQCB (2011)) and the area exhibiting aquatic life BUI, as based on a Toxic Unit approach for the sediment chemistry line of evidence (Figure 3; Conder, 2011a). The Toxic Unit approach is a causal chemical exposure modeling to account for bioavailability of chemicals to benthic invertebrates and predict potential chemical risk. It was used as a replacement approach for the flawed SQGQ1 approach used in the CRWQCB (2010) Triad sediment chemistry line of evidence in order to re-classify Triad stations. It was also used as a replacement approach for the flawed SS-MEQ and 60% of the LAET calculations used in the Non-Triad Data Approach. Both

the revised Triad and Non-Triad Data approaches were used to identify polygons for Aquatic Life BUI (Figure 3). Economic feasibility was also calculated using a footprint designated to address Aquatic Life BUI only (Figure 4). The approach ranked polygons exhibiting Aquatic Life BUI by the highest Toxic Unit result multiplied by the area of the polygon (Table 22). Remedial cost was estimated for five increments according to approximate cost rates suggested by Table A31-1 (Table 23). This approach is more technically-defensible because Aquatic Life BUI is the most likely BUI exhibited at the Site and modeling of human health and ecological risk to aquatic-dependent wildlife is flawed. A revised economic feasibility approach should be adopted by CRWQCB to enable a complete and accurate evaluation of economic feasibility for any propose remedial footprint for the protection of BUIs at the Site.

As noted in NASSCO's reply to the preceding comment, the toxic unit approach does not represent an improvement over the DTR approach to assessment of aquatic life BUI. It is flawed and inappropriate for use in characterizing BUI at the Site. In fact, the SDG&E approach represents a large step backward in that it reverts to a preliminary screening analysis based on an unsubstantiated theoretical relationship in lieu of using the rich, site-specific, empirical database for the shipyard site. Any economic feasibility analysis based on this assessment approach will be similarly flawed. Furthermore, the use of reduction in Sitewide SWAC as the metric of benefit for benthic invertebrate species is inappropriate. Attachment A, Exponent Critique, at 19. Unlike mobile human and wildlife receptors, which spatially average exposure over relatively large areas, benthic invertebrate communities are largely sessile, and must be assessed on a station-by-station basis. *Id.* Sitewide average sediment conditions are not meaningful in measuring aquatic life BUI or BUI mitigation, and the alternative economic feasibility analysis presented is therefore invalid. *Id.*

[NASSCO Comment No. 363, TCAO, at ¶ 18, 31, 32, DTR, at §§ 18, 31, 32, Appendix 31]

**Comment ID:** 390

**Organization:** NASSCO

**DTR Section:** 1.2, 1.4.2.1, 1.5.2, 33, Appendix 33

**Comment:**

Port Comment No. 1: Dr. Johns agrees with the process used to identify the polygons for the remedial footprint and has concluded that the factors used to select "worst first" polygons are consistent with the findings.

The Declaration of Expert D. Michael Johns In Support of the San Diego Unified Port District's Submission of Comments, Evidence, and Legal Argument ("Johns Dec") (Port Comments, Exhibit 3) constitutes untimely expert evidence that should have been submitted to the record on or before March 11, 2011. Accordingly, it must be excluded from the record. See NASSCO's Joinder In BAE's Motions to Exclude Untimely Expert Evidence Submitted By the San Diego Unified Port District and San Diego Gas & Electric, and Motion to Exclude the Untimely Expert Evidence Submitted by the United States Navy.

Furthermore, even if Dr. John's Declaration is accepted into the record, his conclusions should be given no weight for the reasons set forth in NASSCO's Comment Nos. 380-384, Replying to Port Comment Nos. 17 - 21. Attachment A, Exponent Critique, at 20-25.

[NASSCO Comment No. 364, TCAO, at ¶ 33, Attachment 2, DTR, at §§ 1.2, 1.4.2.1, 1.5.2, 33, Appendix 33]

**Comment ID:** 391

**Organization:** NASSCO

**DTR Section:** 1.2, 1.4.2.1, 1.5.2

**Comment:**

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Port Comment No. 2: Dr. Johns also agrees that the Shipyard sediment contamination has contributed to the impairment of beneficial uses in San Diego Bay and likely continues to harm human health and environmental resources. (Exhibit “3” [Dr. Johns Declaration], ¶5(a)-(d).)

See NASSCO’s Comment No. 364, Replying to Port Comment No. 1.

[NASSCO Comment No. 365, TCAO, at ¶ 1, DTR, at §§ 1.2, 1.4.2.1, 1.5.2]

**Comment ID:** 392

**Organization:** NASSCO

**DTR Section:** 15, 19, 25-28, Appendices 15, 19, 27, 28

**Comment:**

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Port Comment No. 3: Dr. Johns has concluded that the contaminants are bioaccumulating in biota relevant to human health and that exposed fish and shellfish can migrate offsite, spreading the reach of the contamination throughout the San Diego Bay and potentially to those who consume the exposed fish and shellfish. (Exhibit “3” [Dr. Johns Declaration], ¶6(a)-(d).)

See NASSCO’s Comment No. 364, Replying to Port Comment No. 1.

[NASSCO Comment No. 366, TCAO, at ¶ 15, 19, 25-28, DTR, at §§ 15, 19, 25-28, Appendices 15, 19, 27, 28]

**Comment ID:** 393

**Organization:** NASSCO

**DTR Section:** 2.3, 3.3, 5.4, 6.4, 10.4, 10.5

**Comment:**

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Port Comment No. 4: Likewise, the shipyard activities are likely exposing and/or redistributing legacy contaminants that create an ongoing source of San Diego Bay contamination. (Exhibit “3” [Dr. Johns Declaration], ¶ 7(a)-(d).)

See NASSCO’s Comment No. 364, Replying to Port Comment No. 1.

[NASSCO Comment No. 367, TCAO, at ¶ 2, 3, 5, 6, 10, DTR, at §§ 2.3, 3.3, 5.4, 6.4, 10.4, 10.5]

**Comment ID:** 394

**Organization:** NASSCO

**DTR Section:** 30, 33, Appendix 33

**Comment:**

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Port Comment No. 5: While some parties may claim that the remediation cannot go forward unless the Chollas Creek outfall area is included within the remedial footprint or otherwise addressed because of recontamination concerns, the Port’s designated fate and transport expert has concluded that any interim resedimentation from Chollas Creek discharges will not adversely impact the remediation efforts at the Shipyards. (Exhibit “2” [Port Expert Designation]; Exhibit “4” [Dr. Poon Declaration], ¶¶ 13-15.)

The Declaration of Expert Ying Poon, D.Sc. In Support of the San Diego Unified Port District’s Submission of Comments, Evidence and Legal Argument (“Poon Dec”) (Port Comments, Exhibit 4) constitutes untimely expert evidence that should have been submitted to the record on or before March 11, 2011. Accordingly, it must be excluded from the record. See NASSCO’s Joinder In BAE’s Motions to Exclude Untimely Expert Evidence Submitted By the San Diego Unified Port District and San Diego Gas & Electric, and Motion to Exclude the Untimely Expert Evidence Submitted by the United States Navy.

Furthermore, even if Dr. Poon’s Declaration is accepted into the record, his conclusions should be given no weight because the model upon which they are based has not been submitted to the record or provided to the Designated Parties. Accordingly, his conclusions must be viewed as unsupported. See NASSCO’s Comment Nos. 385-389, Replying to Port Comment No. 22 - 26. See Attachment A, Exponent Critique, at 26-29.

Finally, it is a basic concept of site cleanup that implementing measures to control the source of contaminants and to verify that control has been accomplished should proceed actual remediation. See Deposition of Steven Bay (“Bay Depo.”) at 209:1-9 (September 27, 2010); Bay Depo, Ex. 106, Sediment Assessment Study for the Mouths of Chollas and Paleta Creek, San Diego (May 2005), at 6, Figure 2-2 (indicating that “Cleanup Implementation” should occur after “TMDL Implementation,” which includes “Implement Source Control” and “Verify Source Reduction”). Accordingly, even if Dr. Poon’s Declaration is accepted into the record and his testimony considered by the Regional Board, his assertion that remediation can proceed prior to controlling storm water contaminant discharge to the Site contradicts basic tenets of site cleanup procedure.

[NASSCO Comment No. 368, TCAO, at ¶ 30, 33, DTR, at § 30, 33, Appendix 33]

**Comment ID:** 395

**Organization:** NASSCO

**DTR Section:** 11

**Comment:**

Port Comment No. 6: To the extent the CUT would designate the Port as a primary discharger because of perceived non-cooperation grounded in the Port’s withdrawal from a voluntary mediation process that it suggested, such a position would be an inappropriate basis for Port primary liability as a matter of law. On the contrary, the Port’s commitment to the above principles is reflected its long history of cooperating with the Regional Board in efforts to remediate sites at which the Port is a landlord . . . .

The DTR does not suggest that the Port was named as a primary discharger “because of perceived non-cooperation grounded in the Port’s withdrawal from a voluntary mediation . . .”,



however, the Port provides no legal authority why a failure to cooperate would not be a relevant factor in naming the Port to the TCAO. DTR at 11-1 – 11-5.

[NASSCO Comment No. 369, TCAO, at ¶ 11, DTR, at § 11]

**Comment ID:** 396

**Organization:** NASSCO

**DTR Section:** 11.1, 11.2

**Comment:**

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Port Comment No. 7: The DTR acknowledges that “[i]n the event the Port District’s tenants, past and present, have sufficient financial resources to clean up the Shipyard Sediment Site and comply with the Order, then the San Diego Water Board may modify its status to secondarily responsible party in the future.” (DTR §11.2, at pp. 11-4 to 11-5.) This anticipated modification is appropriate and should be implemented because there is substantial evidence of the Port District’s tenants’ abilities to fund the Order. . . . the CUT bears an initial burden of establishing through evidence the facts necessary to conclude that the Port’s tenants do not have adequate assets to fund the cleanup efforts. Yet, no such evidence has ever been presented.

It is premature for the Regional Board to determine whether the Port’s tenants, past and present, have sufficient financial resources to cleanup the Site, since those costs have not yet been determined with specificity and work has not yet begun. Until work progresses on the cleanup, it is reasonable for the Regional Board not to distinguish between primarily and secondarily liable parties. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 3 n.2.

[NASSCO Comment No. 370, TCAO, at ¶ 11, DTR, at §§ 11.1, 11.2]

**Comment ID:** 397

**Organization:** NASSCO

**DTR Section:** 11.1, 11.2

**Comment:**

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Port Comment No. 8: In fact, the evidence establishes beyond question that the Port’s tenants have adequate assets to fund the cleanup efforts. . . . Additionally, the Port’s tenants have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability. (See, e.g., SAR 159273, 159289 at ¶21 [NASSCO Lease]; . . . .)

Whether a landlord’s lease includes an indemnity clause is not determinative as to whether the landlord should be named primarily or secondarily liable. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 7-9 (whether lease includes indemnity clause not included as a factor in determining landlord liability).

Accordingly, it is irrelevant to the Regional Board’s decision to name the Port as primarily liable at this time whether the lease agreement includes indemnity language. Finally, it bears mention that the Port only cites to NASSCO’s lease for the period from January 1, 1995 to December 31, 2040, and not to any prior leases with NASSCO, which contain materially different language with respect to NASSCO’s and the Port’s obligations to one another.

[NASSCO Comment No. 371, TCAO, at ¶ 11, DTR, at §§ 11.1, 11.2]

**Comment ID:** 398

**Organization:** NASSCO

**DTR Section:** 11.1, 11.2

**Comment:**

Port Comment No. 9: Additionally, based on its review of relevant documents, the Port believes that NASSCO has hundreds of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts. (Exhibit “12” [Summary of NASSCO Historic Liability Insurance].)

The information in Port Comments, Exhibit 12 (Summary of NASSCO Historic Liability Insurance) was submitted by the Port in breach of a Protective Order entered in Case No. 09 CV 2275-AJB (BGS) in the United States District Court, Southern District of California, regarding the allocation of costs for the cleanup of the Shipyard Sediment Site. The Protective Order prohibited the Port from publicly disclosing any information, including insurance policies, that was designated as “protected” information by NASSCO, or from using “protected” information for any purpose other than prosecuting or defending the federal court lawsuit. NASSCO is presently contesting the Port’s publication of NASSCO’s insurance information in a motion pending before Mr. Timothy Gallagher, the Discovery Referee. For these reasons, NASSCO believes that the insurance information in Port Comments, Exhibit 12 is not properly before the Regional Board, and NASSCO may seek the withdrawal or removal of Exhibit 12 from the administrative record following Mr. Gallagher’s ruling on NASSCO’s motion.

[NASSCO Comment No. 372, TCAO, at ¶ 11, DTR, at §§ 11.1, 11.2]

**Comment ID:** 399

**Organization:** NASSCO

**DTR Section:** 11.1, 11.2

**Comment:**

Port Comment No. 10: The Port’s tenants are currently cooperating with the Regional Board. Although the tenants have been proposing a remedial approach that differs in some respects from the remedial approach proposed by the CUT, the process is “proceeding cooperatively.” (Exhibit “5” [Barker Deposition], Vol. III, 489:20-490:14.)

It is premature for the Regional Board to determine whether the Port’s tenants, past and present, are cooperating with the Regional Board as work has not yet begun. Until work progresses on the cleanup, it is reasonable for the Regional Board not to distinguish between primarily and secondarily liable parties. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 3 n.2.

Furthermore, as presented in NASSCO’s Initial Comments, NASSCO maintains that monitored natural attenuation is the proper remedy for the Site. This position differs materially from the TCAO and DTR under consideration by the Regional Board.

[NASSCO Comment No. 373, TCAO, at ¶ 11, DTR, at §§ 11.1, 11.2]

**Comment ID:** 400

**Organization:** NASSCO

**DTR Section:** 11.1, 11.2

**Comment:**

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Port Comment No. 11: There is no evidence of Port non-cooperation.

See NASSCO's Comment No. 369, Replying to Port Comment No. 6.

[NASSCO Comment No. 374, TCAO, at ¶ 11, DTR, at §§ 11.1, 11.2]

**Comment ID:** 401

**Organization:** NASSCO

**DTR Section:** 11.3.1, 11.4

**Comment:**

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Port Comment No. 12: The Port does not own or operate SW4 or SW9 outfall or the MS4 facilities leading to these outfalls. . . . Rather, the contention is that the Port is “responsible for controlling pollutants into and from its own MS4 system” and that “the Port District cannot passively allow pollutants to be discharged through its MS4 and into another Copermitttees’ MS4s, like the City of San Diego.” (Exhibit “17” [CUT Discovery Response Excerpts], Responses to Special Interrogatories Nos. 28, 30. [emphasis in the original].) Yet, neither the DTR nor the administrative discovery responses identify what part of the MS4 owned or operated by the Port would ultimately lead to SW4 or SW9, much less how such MS4 facilities have discharged pollutants to SW4 or SW9.

The Port's comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the Port presents no affirmative evidence to show that they do not. Instead, like the City, the Port attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

In fact, the Port's own most recent Jurisdictional Urban Runoff Management Program (“JURMP”) document admits that the Port MS4 facilities have the potential to generate pollutants, including bacteria, gross pollutants, metals, nutrients, oil and grease, organics, pesticides, sediment, and trash. Attachment D, San Diego Unified Port District, Jurisdictional Urban Runoff Management Program (May 2008) (“2008 Port JURMP”) Table 6-2 at 6-4. The JURMP goes on to state that the “MS4 receives pollutants generated by motor vehicles, namely, heavy metals, oil and grease, and other toxic pollutants from engine exhaust, brake linings, and leaking fluids. Waste liquids, such as oil and paint, can also be illegally dumped into conveyance system structures. Illegal connections can be made to the MS4 and potentially introduce a wide variety of pollutants to the system. Street curbs and gutters, stormwater inlets, culverts and channels typically collect litter discarded in urban areas. As such, all of these pollutants can reach the MS4 with each rainfall event, and in turn, be carried to receiving water bodies.” Id. at 6-7. It also admits that “[u]rban runoff also appears to be a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay,” including “the mouth of Chollas Creek . . . .” Id. at 1-6 – 1-7. This evidence substantiates the Regional Board's conclusion that the Port is a discharger based on its historical storm water discharges to the Site.

Furthermore, the Port's JURMP indicates that the Port has a sophisticated GIS map of its storm drains, which is not publicly available but could easily have been used by the Port to

generate the necessary information to demonstrate whether the Port's MS4s connect to SW4 and/or SW9. See Attachment D, 2008 Port JURMP Table 6-2 at 6-4; Attachment E, Karen Richardson, GIS Gives Port a Common Operating Picture, ArcUser (Winter 2010) at 33 ("PortGIS Utilities is the central clearinghouse for the port's utilities data, including . . . storm drain . . . lines"). Accordingly, it is unfair for the Port to assert that the DTR and TCAO are insufficient because they do not specify what part of the Port's MS4 system connects to SW4 and/or SW9 when that information is uniquely in the possession of the Port itself.

[NASSCO Comment No. 375, TCAO, at ¶ 11, DTR, at §§ 11.3.1, 11.4]

**Comment ID:** 402

**Organization:** NASSCO

**DTR Section:** 11.3 – 11.6

**Comment:**

Port Comment No. 13: The DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination.

See NASSCO's Comment No. 375, 377, Replying to Port Comment No. 12 and 14.

[NASSCO Comment No. 376, TCAO, at ¶ 11, DTR, at §§ 11.3 – 11.6]

**Comment ID:** 403

**Organization:** NASSCO

**DTR Section:** 11.6.4, 11.6.5

**Comment:**

Port Comment No. 14: The TCAO and DTR fail to provide evidentiary support for the conclusion that SW4 and SW9 have discharged contaminants to San Diego Bay and the Shipyard Sediment Site. In fact, the DTR acknowledges that "no monitoring data is available" for either SW4 or SW9. (DTR §§11.6.4, at p. 11-13 [SW4]; 11.6.5, at p. 11-15 [SW9].)

The Port contends that there is "no [e]vidence" that storm water outfalls SW4 and SW9 are discharging contaminants to the Site. The Port bases this claim on the fact that there is no monitoring data available from either SW4 and SW9 to indicate specific quantities of COCs in the runoff.

The Port's claim that there is "no [e]vidence" goes too far because, as noted in the DTR, urban runoff itself is classified as a "waste" under the California Water Code § 13050(d). DTR at 11-8; see also Cal. Water Code §§ 13392 (State and Regional Boards to coordinate with Departments of Public Health and Fish & Game to develop "new programs to reduce urban and agricultural runoff"); 13396.7(a) (commissioning a study to determine adverse health effects of urban runoff on swimmers at urban beaches). In fact, the DTR includes substantial evidence that urban runoff in San Diego contains COCs at the Site, including "total suspended solids (TSS), sediment (due to anthropogenic activities), pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc, and cadmium), petroleum products and polynuclear aromatic hydrocarbons (PAHs and HPAHs), synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash." DTR at 11-8; see also 4-10 (San Diego County Municipal

Copermittees 2002-2003 Urban Runoff Monitoring Final Report submitted by the City indicating that “elevated levels of zinc, copper, and lead are present in the urban runoff outflow discharged from Chollas Creek into San Diego Bay”).

Furthermore, the DTR demonstrates that samples taken in the SW4 catch basin, and laterals entering the catch basin, “indicate the presence of both PCBs and PAHs entering and exiting the municipal storm drain system catch basin . . . .” DTR at 4-16. Far from suffering from a lack of evidence, the DTR has presented substantial evidence that San Diego urban runoff contains relevant COCs, but simply did not take the extra step to quantify the amount of COCs that actually are present in storm water flows as they exit the SW4 and SW9 outfalls.

Notably, the Port’s comments do not allege that storm water discharges from SW4 and SW9 do not contain relevant COCs, and the Port presents no affirmative evidence to show that they do not. Instead, like the City, the Port attempts to skirt the issue by simply claiming that the DTR does not provide sufficient support.

Furthermore, the Port’s citation to *Natural Resources Defense Council v. County of Los Angeles*, 636 F.3d 1235 (9th Cir. 2011) (“NRDC”), is unavailing with respect to allocating responsibility for storm water contamination to sediment to the Port. This is so because NRDC is a case under the Clean Water Act concerning whether a NPDES permittee was guilty of violating NPDES permit limits. Here, the issue is not whether the Port violated NPDES permit limits, but rather, whether the Port discharged COCs to the Site that have contaminated sediment. In fact, the DTR does not allege that the Port has violated its NPDES permit, but rather, that the Port has discharged storm water containing contaminants to San Diego Bay, and that the “urban storm water containing waste that has discharged from the on-site and off-site MS4 has contributed to the accumulation of pollutants in the marine sediments at the Shipyard Sediment Site to levels, that cause, and threaten to cause, conditions of pollution, contamination, and nuisance by exceeding applicable water quality objectives for toxic pollutants in San Diego Bay.” DTR at 11-1 – 11-2. As noted above, the Port fails to allege that storm water discharges from SW4 and SW9 do not contain relevant COCs.

Finally, as also noted in the DTR, “[i]n the absence of such direct evidence, the San Diego Water Board may consider relevant direct or circumstantial evidence in determining whether a person shall be required to clean up waste and abate the effects of a discharge or a threat of a discharge under CWC section 13304.” DTR at 10-13, citing State Water Resources Control Board Resolution 92-49, Policies and Procedures for the Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304, § I.A (directing the Regional Boards to use “any relevant evidence, whether direct or circumstantial”, when determining whether a party should be required to investigate or cleanup a discharge of waste). Accordingly, even if storm water sampling data from SW4 and SW9 is unavailable, it is proper for the Regional Board to consider and rely on other direct and circumstantial evidence that leads to the conclusion that the Port’s storm water discharges have contaminated the NASSCO shipyard.

[NASSCO Comment No. 377, TCAO at ¶ 11, DTR, at §§ 11.6.4, 11.6.5]

**Comment ID:** 404  
**DTR Section:** 11.3 – 11.6

**Organization:** NASSCO

**Comment:**

Port Comment No. 15: Even if there was adequate evidence that SW4 and SW9 are discharging pollutants, there are no monitoring or test results establishing that there have been discharges from the Port's MS4 facilities into the City MS4 facilities that lead to the outfalls at SW4 and SW9. . . . In fact, the Port has only very limited MS4 facilities that lead to SW4 and no MS4 facilities leading to SW9.

See NASSCO's Comment No. 377, Replying to Port Comment No. 14.

[NASSCO Comment No. 378, TCAO, at ¶ 11, DTR, at §§ 11.3 – 11.6]

**Comment ID:** 405

**Organization:** NASSCO

**DTR Section:** 11.6.5

**Comment:**

Port Comment No. 16: Finally, even if SW9 was discharging some contaminants, this would not be a proper basis for liability. . . . The Port's designated expert, Dr. Ying Poon, has done extensive fate and transport modeling analysis and confirmed that any discharges from Chollas Creek would not result in any significant deposit, accumulation or resedimentation of the Shipyard Sediment Site. (Exhibit "2" [Port Expert Designation]; Exhibit "4" [Dr. Poon Declaration], ¶¶13-15.) This extensive modeling contradicts the assumption in the TCAO that, based on the erroneous Exponent Report approach, Chollas Creek flows result in the settling of contaminated sediment at the Shipyard Sediment Site. In the absence of any substantial evidence that SW9 discharges are transporting contaminants to the Shipyard Sediment Site, the Port cannot be liable based upon these alleged discharges.

See NASSCO's Comment No. 377, Replying to Port Comment No. 14. In addition, the Port overstates the results of its expert, Dr. Ying Poon, with respect to SW9. (NASSCO notes that the Port has not yet provided the Regional Board or the Designated Parties with Dr. Poon's hydrodynamic and water quality numerical model (the Bay Model), the result of which Dr. Poon summarizes in his declaration. See Port Comments, Exhibit 4, Poon Dec. at ¶ 7.). In its comments, the Port claims that Dr. Poon's analysis shows that discharges "from Chollas Creek would not result in any significant deposit, accumulation or resedimentation of the [Site]." Port Comments at 19, citing Port Comments, Exhibit 4, Poon Dec, ¶¶ 13-15. Yet the Poon Dec states that "it is unlikely that Chollas Creek would be a major source of contaminants . . .", but in fact, confirmed that Chollas Creek would be a source of sedimentation at the Site. Id.

[NASSCO Comment No. 379, TCAO, at ¶ 11, DTR, at § 11.6.5]

**Comment ID:** 406

**Organization:** NASSCO

**DTR Section:** 2.3, 3.3, 5.4, 6.4, 10.4, 10.5, 19, 25-28

**Comment:**

Port Comment No. 17 (Exhibit No. 3, Declaration of Expert Michael Johns, ¶ 5): It is my opinion that there is sufficient evidence that the Shipyard Site sediment contamination has

contributed to the impairment of beneficial uses in San Diego Bay and likely continues to harm human health and environmental resources for the following reasons:

- a. Sediment contaminants in Site sediments are present, bioavailable, and, for a number of the contaminants, bioaccumulative.
- b. Fish and shellfish collected at the Site have accumulated contaminants at concentrations predicted to harm seafood consumers (i.e., recreational and subsistence fishers).
- c. Although fishing and shellfish harvesting do not occur on the Site because of security restrictions, there are nearby public access points and the fish and shellfish that have accumulated contaminants are mobile.
- d. Shipyard activities at the Site periodically disturb contaminated sediments, creating an ongoing source of legacy contaminants and impacting beneficial uses in the Bay.

None of Dr. Johns' four assertions regarding human wildlife exposure and risk constitute scientifically valid evidence of existing or likely future beneficial use impairment from Site sediment contamination for the following reasons:

¶ 5.a. "Sediment contaminants are present, bioavailable, and bioaccumulative." Although this statement is supported by available data in the DTR in a qualitative sense, the presence, bioavailability, and bioaccumulative potential of chemicals do not, in and of themselves, constitute a human health risk or beneficial use impairment. Impairment cannot be assessed without a quantitative assessment of exposure and toxicity, which Dr. Johns does not provide.

¶ 5.b. "Fish and shellfish at the site contain harmful levels of contaminants to human anglers." This conclusion requires an exposure and toxicity assessment. Because Dr. Johns does not provide any such assessment, it appears he is relying solely on the Tier II human health risk assessment contained in the DTR, which is critically flawed. See Exponent, Evaluation of Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 for the NASSCO Shipyard Sediment Site, Expert Report of Thomas C. Ginn, Ph.D. (March 11, 2011) ("Ginn 2011"); Chemrisk, Brent Finley, Ph.D., Expert Opinion Letter Regarding the Draft Technical Report for Tentative Cleanup and Abatement Order No. R9-2011-0001 (March 11, 2011) ("Finley 2011"). The DTR Tier II human health risk assessment for both recreational and subsistence anglers assumes a highly unrealistic fractional intake from the Site of 100 percent. A quantitative assessment with more realistic assumptions concerning fractional intake, conducted in a manner consistent with regulatory guidance and precedents, would conclude that no unacceptable risk for human anglers exists. Ginn 2011 at 92-98; Finley 2011 at 23-28, 36-51.

¶ 5.c. "The mobility of fish and lobsters indicates a risk to anglers who fish outside the Site boundaries." No quantitative exposure analysis is presented to substantiate this claim, and no analysis of off-site angler exposure is contained in the DTR. Site-related contaminants carried by motile fish and lobsters to areas frequented by anglers can only pose a risk to human consumers if they are caught and consumed in sufficient quantity and frequency to exceed chemical-specific toxicity thresholds. Without data to support this claim, it is purely speculative, and without scientific basis. Furthermore, the Ginn and Finley expert reports document that there is no risk to recreational or subsistence anglers. Ginn 2011 at 76-100; Finley 2011 at 7-51.

¶ 5.d. "Shipyard activities disturb sediments, creating beneficial use impairment throughout the Bay." While it is likely, and Site-specific data support the notion that a certain degree of vertical mixing and resuspension of buried sediments takes place within the Shipyard leasehold

in areas where vessel movements and engine testing take place, there is no analysis of any kind presented to support Dr. Johns' assertion of Bay-wide impacts. The DTR does not contain any quantitative analysis of sediment transport beyond the site boundaries, and Dr. Johns does not claim to have performed any such analysis or present any evidence that would support his allegation of beneficial use impairment beyond the Shipyard Site boundaries.

Attachment A, Exponent Critique, at 20-21.

[NASSCO Comment No. 380, TCAO, at ¶ 2, 3, 5, 6, 10, 19, 25-28, DTR, at §§ 2.3, 3.3, 5.4, 6.4, 10.4, 10.5, 19, 25-28, Appendices 19, 27, 28]

**Comment ID:** 407

**Organization:** NASSCO

**DTR Section:** 19, 25-28, Appendices 19, 27, 28

**Comment:**

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Port Comment No. 18 (Exhibit No. 3, Declaration of Expert Michael Johns, ¶ 6): It is my opinion that COCs are bioaccumulating in biota for the following reasons:

- a. Laboratory exposures to site-collected sediments established that statistically significant accumulations of selected contaminants (arsenic, copper, lead, mercury, zinc, TBT, total PCBs, and high molecular weight PAHs) occur in clams that are in direct contact with and ingest contaminated sediments, providing evidence that Site sediments contribute to the contaminant residues in the tissues of benthic organisms.
- b. Benthic organisms are an important component of marine food webs and are a major component of the diet for both the sand bass and spiny lobster as well as many other fish, invertebrate and bird species.
- c. Many of the fish and shellfish that prey upon contaminated benthic organisms within the Site can be consumed by people, are highly mobile and can migrate off the Site throughout large portions of San Diego Bay. These mechanisms contribute to the transfer of contaminants from the sediment to higher order receptors (including those relevant to human exposure) outside of the Site. The life histories of sand bass and spiny lobster, the two species targeted for human health evaluation at the Site, involve migration over large portions of San Diego Bay?
- d. PCBs are bioaccumulative, and cleanup is necessary for incremental improvement in the beneficial use of San Diego Bay by recreational and subsistence fishers.

Dr. Johns enumerates four reasons to believe that Shipyard Site sediment contaminants are bioaccumulating in biota. While the Site-specific data and the analyses contained in the DTR do support the generic conclusion that some bioaccumulation of COCs occurs, nothing put forward in this comment supports his assertion that bioaccumulation results directly in beneficial use impairment. Such a conclusion could only be supported by a quantitative exposure and toxicity assessment for higher trophic order consumer species, and Dr. Johns apparently relies solely on the food web associated risk assessments presented in the DTR. The flaws inherent in the DTR Tier II human health assessment are described in Ginn 2011. See Ginn 2011 at 79-94. The DTR Tier II aquatic dependent wildlife risk assessment is similarly flawed. This is so because all wildlife exposure calculations in the DTR were based on a highly unrealistic assumption of 100



percent area use for all receptors and exposure scenarios, and included inappropriate toxicity reference values for lead. See Ginn 2011 at 59-64, 71-73.

A quantitative risk assessment using realistic exposure and toxicity assumptions, performed and interpreted in accordance with regulatory guidance and precedent would conclude that no unacceptable risk for wildlife exists. See Ginn 2011 at 59-78. Accordingly, there is no justification for remediation to protect human or wildlife receptors on the basis of food web mediated exposure.

Attachment A, Exponent Critique, at 21-22.

[NASSCO Comment No. 381, TCAO, at ¶ 19, 25-28, DTR, at §§ 19, 25-28, Appendices 19, 27, 28]

**Comment ID:** 408

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 20 (Exhibit No. 3, Declaration of Expert Michael Johns, ¶ 8): In my opinion, the process used by the Water Board to identify areas requiring remedial actions (e.g., use of polygons to define the remedial footprint) was appropriate. In using the polygons, the Water Board recognized that species such as fish and spiny lobster are mobile and that exposure to Site contaminants can occur site-wide rather than only at a single location. In developing the proposed remedial footprint, the Water Board correctly addressed impairment to more sedentary species, such as the organisms that form the benthic community. The factors used by the Water Board to select “worst first” polygons are consistent with my findings.

No response necessary. Dr. Johns’ views on the appropriateness of the Regional Board’s methodology has no bearing on whether the proper outcome was reached. Attachment A, Exponent Critique, at 23.

[NASSCO Comment No. 383, TCAO, at ¶ 32, 33, DTR, at 32, 33, Appendices 32, 33]

**Comment ID:** 409

**Organization:** NASSCO

**DTR Section:** 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 21 (Exhibit No. 3, Declaration of Expert Michael Johns, ¶ 9): It is my opinion that the remedial footprint contemplated by the DTR will adequately address risks posed by contaminated sediments within the Site in accordance with the Water Board’s responsibility to protect the beneficial uses of waters of the state pursuant to California Water Code section 13304, with the following caveats:

a. Polygon SW29 - Only a portion of this polygon was included in the proposed remedial action footprint; the remaining area will be the subject subsequent action by the Water Board. Having reviewed additional data collected from within the boundaries of the SW29 polygon (i.e., split sample data from the samples collected by SDG&E under Order No. R9-2004-0026), I found

that total PCB concentrations measured in samples represent some of the highest found within the Site. In addition polygon SW29 is at the edge of the study area and represents an unbounded area of higher concentrations of total PCBs. Because of these factors (i.e., high PCB concentrations not bounded by sediment data showing lower concentrations), the portion of polygon SW29 not currently included in the remedial footprint warrants subsequent action.

b. Polygon NA23 -The DTR acknowledges the high ranking of this polygon using the “worst first” analysis but concludes that it is technically infeasible to dredge because doing so would adversely affect Pier 12, the tug boat pier, and the riprap shoreline, as well as undermine the sediment slope for the floating dry dock sump. However, other areas in which dredging is not feasible are currently included in the remedial action footprint. Alternative remedial technologies proposed in these latter areas include capping and backfill. The constraints that precluded dredging in polygon NA23 (e.g., inaccessibility of sediment under piers) appear to have been overcome for these other areas. Therefore, the decision not to include polygon NA23 in the remedial action footprint on the basis of technical feasibility should be re-evaluated.

Dr. Johns’ comment with respect to polygon SW29 suggests that remedial action should occur at all areas of polygon SW29 not included in the DTR remedial footprint due to PCB concentrations that are “...some of the highest found within the Site” and because the polygon is near the edge of the study area. However, he presents no analysis that suggests the proposed remedial footprint is insufficient to protect beneficial uses, nor does he explicitly assert that PCBs (or any other COC) concentrations at polygon SW29 pose an unacceptable risk or beneficial use impairment that requires remediation to mitigate. He apparently is suggesting that the remedial footprint be expanded solely on the basis of relative chemistry – only one leg of the triad analysis – and not on the basis of biological effects or receptor exposure. The spatially-weighted average exposure approach for assessing food web risks, and the weight of evidence approach for assessing risk to aquatic life, both of which Dr. Johns apparently agrees with, support the protectiveness of the DTR proposed remedial footprint, even given the extreme assumptions of the DTR exposure analyses for humans and wildlife.

Furthermore, Dr. Johns’ comment with respect to polygon NA23 appears to be premised on the notion that “inaccessibility of sediment under piers” is the primary reason why dredging is infeasible at polygon NA23.

In fact, remediation of polygon NA23 is significantly more problematic than the remediation of other polygons, including those where sediment is inaccessible due to the presence of an overwater pier, due to the unique combination of conditions at NA23.

Specifically, NA23 is comprised largely of steep and lengthy slopes, which are located immediately adjacent to the pile-supported structure of Pier 12 and the armored shoreline, and which leave little to no room in which to establish a stabilizing offset distance. NASSCO’s Initial Comments, Attachment D, Anchor QEA Technical Memorandum at 2 (May 26, 2011). These sloping areas are inclined at up to approximately 3H:1V (close to the sediment’s natural angle of repose) and encompass 30 to 40 feet of vertical relief, making them among the steepest and highest in relief of any slopes at the shipyard site. *Id.* In such situations, dredging on any part of the slope must be accompanied by dredging to a similar extent all the way up the slope in order to maintain overall slope stability; otherwise, undredged areas higher up would quickly collapse into dredged areas below. *Id.* at 2-3.

However, since the upper portions of the slopes at NA23 are adjacent to Pier 12 and the armored shoreline slope, removal of material would lessen the stability of these features, and necessitate significant structural improvements to prevent catastrophic collapse of these features. Id. at 2-3. Elsewhere on the project site, such a scenario can be mitigated by installing a rock buttress alongside the structure of slope, so that it will be less likely to be undermined or weakened. Id. at 3. At polygon NA23, however, there is limited to no room in which to add such a feature, and in any event, situating one at the top of a dredged slope would be inherently unstable due to the fact that there is insufficient room to maintain a stabilizing offset distance. Id.

Thus, the unique set of conditions found at NA23, including the (1) steep slopes, (2) presence of adjoining features, and (3) limited ability to counteract the destabilizing influence of dredging along those features, renders remediation of NA23 technically infeasible.

Finally, Dr. Johns provides no biological or risk basis for concluding that NA23 should be added to the remediation footprint. The available data for Station NA23 suggest the opposite in fact (see summary below). Based on relatively low chemistry, and the lack of toxicity, benthic impacts from sediment contamination at NA23 are not considered likely. This area is known to be periodically disturbed by raising and lowering of the large floating dry dock, and it is likely that the single benthic community indicator that was outside reference conditions (total abundance) is due to physical disturbance. Accordingly, NA23 was properly excluded from the proposed remedial footprint in the DTR.

#### Station NA23

Primary COCs are relatively low:

- Composite SWAC ranking = 31 of 66 polygons
- Copper ranking = 11 of 66 polygons
- Mercury ranking = 13 of 66 polygons
- HPAH ranking = 36 of 66 polygons
- PCB ranking = 20 of 66 polygons
- TBT ranking = 36 of 66 polygons

Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.72 (less than 0.90 benchmark)

No direct evidence of impacts to benthic community:

- Non-Triad Station in Phase 2
- Triad Station in 2009: “Possible” benthic impacts
- DTR chemistry score = moderate

SQGQ1 is less than 1.0. Only one chemical exceeds both DTR SQG and UPL.

- DTR toxicity score = low

Amphipod, and urchin tests both scored above reference LPL.

- DTR benthic disturbance score = moderate

The total abundance is below that found in the reference condition. However, the other three indicators show no sign of disturbance. BRI is below the reference UPL. Number of taxa and diversity index are above reference LPL. The relatively low abundance is likely the result of physical disturbance in this area, due to dry dock operations.

- No SPI data

Attachment A, Exponent Critique, at 23-25; Attachment F, Exponent, Summary of Need to Remediate NASSCO Stations, REVISED (June 23, 2011).

[NASSCO Comment No. 384, TCAO, at ¶ 32, 33, DTR, at 32, 33, Appendices 32, 33]

**Comment ID:** 410

**Organization:** NASSCO

**DTR Section:** 30, 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 22 (Exhibit No. 4, Declaration of Expert Ying Poon, ¶ 6): I evaluated the assertions made in the Exponent Report that Chollas Creek is a source of toxic discharges to the Shipyard Sediment Site (the “Site”). The Exponent Report assertion is based on the Schiff Report which showed the spreading of fresh water and suspended sediment plumes over the Site during two monitored rain events. The Exponent Report assertion assumes that suspended sediments traveling with the fresh water plume will deposit to the shipyard beds even though the Schiff Report did not show any measurement of where the suspended sediments would have been settled during the two rain events.

The Port has not yet provided the Regional Board or the Designated Parties with Dr. Poon’s hydrodynamic and water quality numerical model (the Bay Model), summarized in his declaration. While he has applied a well known hydrodynamic and water quality model, he provides no description of the model grid and the limited description of the data used to set up the model and the data used to calibrate and verify the model is well below standard modeling practice. Accordingly, it is impossible to verify his conclusions. A model cannot be properly evaluated unless there is a demonstration that the model input data were representative and that the model calibration and validation results were a reasonable representation of actual field data.

It is notable, however, that Dr. Poon concludes that sediment is transported by Chollas Creek storm water flows to the Site. Attachment A, Exponent Critique, at 26.

[NASSCO Comment No. 385, TCAO, at ¶ 30, 32, 33, DTR, at 30, 32, 33, Appendices 32, 33]

**Comment ID:** 411

**Organization:** NASSCO

**DTR Section:** 30, 32, 33

**Comment:**

Port Comment No. 23 (Exhibit No. 4, Declaration of Expert Ying Poon, ¶ 12): The Bay Model shows that, during a 1-year flood event and a 100-year flood, the clay and silt deposition patterns differ from the transport patterns of salinity and suspended sediment. The fresh water plume extends throughout the Site, showing a northward transport. The suspended sediment plume is visible in the Site, but the clay deposition pattern shows that most of the clays will settle elsewhere in the bay. The silt mainly deposited near the creek mouth, with some deposited in the shipyard areas and further north. The clay and silt deposition patterns determined from the Bay Model were consistent with the other sediment transport studies conducted by the U.S. Navy for Chollas Creek.

Dr. Poon's conclusions are not credible. As stated above, while he has applied a well known hydrodynamic and water quality model, he provides no description of important data used to set up the model and the data used to calibrate and verify the model. For example, there is no mention in Dr. Poon affidavit of the distribution of particle sizes that he assumed for Chollas Creek runoff. This is a critical issue, because if the distribution is too coarse, the particles settle out too soon and if too fine, the particles settle out too slowly or not at all.

Another critical problem with Dr. Poon's declaration is that he relies on the model's portrayal of the deposition of clay and silt size particles based on his characterization of inflow from Chollas Creek and ignores sediment data which indicates where clay and silt size particles derived from Chollas Creek actually do settle out. For example, Figures A-3 through A-5 of SCWRP, 2005, Sediment Assessment Study for the Mouths of Chollas and Paleta Creek, San Diego Phase I Report (SCCWRP and U.S. Navy, 2005): Appendix A – F, clearly shows deposition of not only silt, but also clay even within the mouth of Chollas Creek, as shown in Figure 2 below. For this reason, Dr. Poon's statement that fine-grained particles settle out in the mouth of Chollas Creek and that clay-size particle are dispersed throughout the Bay with very minimal deposition in the SY should not be considered.

Figure 2. Shown is Figure A-4 from SCCWRP (2005) depicting the distribution of clay a Chollas Creek.

Attachment A, Exponent Critique, at 26-28.

[NASSCO Comment No. 386, TCAO, at ¶ 30, 32, 33, DTR, at 30, 32, 33]

**Comment ID:** 412

**Organization:** NASSCO

**DTR Section:** 30, 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 24 (Exhibit No. 4, Declaration of Expert Ying Poon, ¶ 13): Based on the Bay Model simulation results, the Exponent Report overestimates Chollas Creek as a source of toxics to the Site based on the results shown in the Schiff Report. This is because:

- a. Transport of the fresh water flows from Chollas Creek moves northward during ebb tides and southward during flood tides;
- b. A snapshot of the fresh water plume does not necessarily reflect the corresponding sediment deposition patterns;
- c. Clay-sized particles from Chollas Creek are predominantly transported throughout the entire San Diego Bay; and
- d. Silt-sized particles from Chollas Creek tend to deposit shortly after entering the bay near the creek mouth.

Dr. Poon's conclusions are not credible for the reasons set forth NASSCO's Comment Nos. 385 - 386, Replying to Port Comment No. 22-23.

[NASSCO Comment No. 387, TCAO, at ¶ 30, 32, 33, DTR, at 30, 32, 33, Appendices 32, 33]

**Comment ID:** 413 **Organization:** NASSCO

**DTR Section:** 30, 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 25 (Exhibit No. 4, Declaration of Expert Ying Poon, ¶ 14): Consequently, for a 100-year rain event, the predicted clay deposition thicknesses at the Site are less than .04 mm and the predicted silt deposition thickness is less than 1 mm. For the more typical 1-year rain event, the predicted clay deposition thickness at the Site is .002 mm and the predicted silt deposition thicknesses are less than .05 mm.

Dr. Poon's conclusions are not credible for the reasons set forth NASSCO's Comment Nos. 385 - 386, Replying to Port Comment No. 22-23.

[NASSCO Comment No. 388, TCAO, at ¶ 30, 32, 33, DTR, at 30, 32, 33, Appendices 32, 33]

**Comment ID:** 414 **Organization:** NASSCO

**DTR Section:** 30, 32, 33, Appendices 32, 33

**Comment:**

Port Comment No. 26 (Exhibit No. 4, Declaration of Expert Ying Poon, ¶ 15): Given these results, it is unlikely that Chollas Creek would be a major source of contaminants that bind with fine sediments to the NASSCO and BAE shipyards. Even under a 100-year event, sediment deposition at the Site was predicted to be insignificant compared to the proposed remedial dredge depths. Based on the remedial footprints and dredged volumes specified in Tentative Cleanup and Abatement Order No. R9-2011-0001, the remedial dredge depths for BAE and NASSCO were estimated to be approximately 1.4 m and 1.9 m, respectively. The Bay Model results show that it would take thousands of 100-year rain events for sediment discharging from Chollas Creek to have accumulated to similar thicknesses at the remedial dredge depths.

Dr. Poon's conclusions are not credible for the reasons set forth NASSCO's Comment Nos. 385 - 386, Replying to Port Comment No. 22-23.

[NASSCO Comment No. 389, TCAO, at ¶ 30, 32, 33, DTR, at 30, 32, 33, Appendices 32, 33]

**Comment ID:** 416 **Organization:** BAE Systems

**DTR Section:** 1.3.2

**Comment:**

BAE Systems San Diego Ship Repair, Inc.'s reply to City of San Diego's COMMENT 3.0

## II.REGIONAL BOARDS SHOULD REVIEW EVIDENCE WITH A VIEW TOWARDS LIABILITY

To be named as a discharger, all that is required is "sufficient evidence" of responsibility. See The State Board Water Quality Enforcement Policy, No. 2002-0040, (Feb. 19, 2002). To

this end, “a regional water board shall “[u]se any relevant evidence, whether direct or circumstantial” in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added). The resolution provides a number of potential sources of evidence, including site characteristics and location in relation to other potential sources of a discharge; hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality; industry-wide operational practices that have led to discharges, such as conveyance systems; and physical evidence, such as analytical data. (Id.)

In light of the Clean Water Act’s declared objective and the broad discretion granted to regional water boards by the Act and its implementing regulations, State Water Board decisions suggest that a regional water board should look at evidence with a view toward finding liability. According to the State Water Board, “[g]enerally speaking it is appropriate and responsible for a Regional Board to name all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility.” See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 11 (SWRCB 1985) (noting further that “substantial evidence” means “credible and reasonable evidence which indicates the named party has responsibility”); Stinnes-Western Chemical Corp., Order No. 86-16, at 12 (SWRCB 1986) (same

**Comment ID:** 417

**Organization:** BAE Systems

**DTR Section:** 4.7.2, Table 4-4, 4.4, 4.72

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.’s reply to City of San Diego's COMMENT 3.0

### III. SUBSTANTIAL AND REASONABLE EVIDENCE SUPPORTS THE DTR'S ASSERTION THAT THE CITY'S SW4 OUTFALL HAS CONTRIBUTED TO ELEVATED LEVELS OF POLLUTION AT THE BAE LEASEHOLD.

#### A. 2009 SW4 Sampling Data Detects PCBs, Copper, TBT and Mercury

On December 7, 2009, water quality data from SW4 were collected from a manhole on the BAE leasehold. (CalScience Environmental Laboratories, 2009). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. Laboratory analyses included a congener-level analysis of PCBs. Multiple congeners were detected, and the highest concentrations were of penta- and hexa-chlorinated biphenyls, similar to the profile of Aroclor 1254. (Id.) Copper, mercury, and TBT were also measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of 2009 there was an ongoing source of PCBs, copper, mercury and TBT from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2009 have dissipated, nor have upland source control measures been established, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

#### B. 2005 SW4 Sampling Data from City Investigation Detects PCBs and PAHs

Further evidence of discharges from the City's storm drain SW4 into the Shipyard sediment site is provided by the results of a sampling investigation conducted by the City itself. As described in the DTR (section 4.7.2), on October 3, 2005, the City conducted an investigation and observed evidence of an illegal discharge into the SW4 catch basin on the north side of

Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems' parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. During the City's investigation, three sediment samples were collected and analyzed for PCBs and polycyclic aromatic hydrocarbons (PAHs). The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the east. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from the north. The third sample was collected from the 18-inch pipe exiting the catch basin. The results of these three samples, presented in DTR Table 4-4, indicate the presence of PCBs and PAHs entering and exiting the municipal storm drain system catch basin. The results of this sampling show significant concentrations of Aroclor 1254 and 1260. (DTR Table 4-4.)

The City's Comment 3.0 does not dispute any of the foregoing facts or findings. Instead, the City refers to alleged facts regarding SDG&E cleaning out the catch basin following the investigation. Those alleged facts are irrelevant under Water Code section 13304 for the reasons stated in Section I infra.

C.2001 SW4 Sampling Data Detects TBT, Copper and Mercury

On November 29, 2001, water quality data from SW4 were collected from a manhole on the BAE leasehold. (AMEC, 2001). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. TBT, copper, and mercury were all measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of late 2001 there was an ongoing source of TBT, copper, and mercury from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2001 have dissipated, nor have upland source control measures been established, and moreover the 2009 SW4 data again detects these same COCs in addition to PCBs, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

D. Historical Discharges by the City through SW4 have Significantly Contributed to Contamination at the Site.

In 1974 the Southern California Coastal Water Research Project ("SCCWRP") published the results of an EPA-funded study entitled "Marine Inputs from Polychlorinated Biphenyls and Copper from Vessel Antifouling Paints." (Young et al., 1974.) The project surveyed the usage of PCB-containing hull paint on recreational, commercial, and Navy vessels in San Diego Bay and other southern California bays, and as collected data on PCB releases in municipal wastewater and storm runoff. (Id.)

Contrasting the PCB mass release rates for different sources (Table 12 in Young et al. 1974) shows that municipal wastewater was a major source of Aroclor 1254 to San Diego Bay, contributing more than 99.9 percent of total PCBs. Thus, as of 1974, municipal wastewater carried by the City's MS4 system and discharged via SW4 was a major source of PCB contamination at the BAE Leasehold. (Id.) The City identifies no study or data indicating that the sources of PCBs to the San Diego Bay was by any means other than those identified by Young, et al. Absent findings to the contrary, it is reasonable to conclude that the City was a major contributor of PCBs to the San Diego Bay for decades.

E. EPA Guidance Confirms that Waste Water Discharged by the City through SW4 has Significantly Contributed to Contamination at the Site



Relevant EPA guidance supports the DTR's findings with respect to waste in urban storm water discharged through the City's SW4 outfall at the BAE Leasehold. In 1983 the EPA published "Results of the Nationwide Urban Runoff Program." The Executive Summary states that among the many objectives of the National Urban Runoff Program ("NURP") was to develop analytical methodologies to examine "the quality characteristics of urban runoff, and similarities or differences at different urban locations" and "the extent to which urban runoff is a significant contributor to water quality problems across the nation." (EPA, Results of the Nationwide Urban Runoff Program, Executive Summary at p. 1.) "The NURP studies have greatly increased our knowledge of the characteristics of urban runoff, its effects upon designated uses, and of the performance efficiencies of selected control measures." (Id. at p. 2.) The NURP Final Report reached several relevant conclusions, including:

- "Heavy metals (especially copper, lead and zinc) are by far the most prevalent priority pollutant constituents found in urban runoff. End-of-pipe concentrations exceed EPA ambient water quality criteria and drinking water standards in many instances. Some of the metals are present often enough and in high enough concentrations to be potential threats to beneficial uses." (Id. at p. 5.)

- "Total suspended solids concentrations in urban runoff are fairly high in comparison with treatment plant discharges. Urban runoff control is strongly indicated where water quality problems associated with TSS, including build-up of contaminated sediments, exist." "[T]he problem of contaminated sediment build-up due to urban runoff...undeniable exists." (Id. at p. 6.)

- "A summary characterization of urban runoff has been developed and is believed to be appropriate for use in estimating urban runoff pollutant discharges from sites where monitoring data are scant or lacking, at least for planning level purposes." (Id. at p. 7.)

With respect to this last conclusion regarding the development of a summary characterization, the NURP Report states that "[a]lthough there tend to be exceptions to any generalization, the suggested summary urban runoff characteristics given in Table 6-17 of the report are recommended for planning level purposes as the best estimates, lacking local information to the contrary." (Id. at p. 7.) "[I]n the absence of better information the data given in Table 6-17 are recommended for planning level purposes as the best description of the characteristics of urban runoff." (EPA, Results of the Nationwide Urban Runoff Program, Volume I – Final Report, at p. 6-43.) Those characteristics of urban runoff include the presence of significant levels of pollutants including total suspended solids, heavy metals, inorganics, and pesticides. (Id., at Tables 6-17 through 6-21.) The NURP data supports and confirms the DTR's assertion that:

"The City of San Diego has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes." (DTR, § 4.4.)

The NURP data also supports and confirms the DTR's assertion that "it is highly probable that historical and current discharges from [SW4] outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site." (DTR § 4.7.2.)

**Comment ID:** 418  
**DTR Section:** 32.1

**Organization:** BAE Systems

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

I.INTRODUCTION

In their May 26, 2011 comments regarding the TCAO and accompanying DTR, SDC and EHC argue that the Regional Board applied the improper legal standard in determining the appropriate cleanup level at the Shipyard Site, improperly reached the conclusion that cleanup to background is not economically feasible, improperly formulated the DTR-recommended cleanup levels, and failed to ensure that the DTR-recommended cleanup levels achieve the best water quality reasonable. Their position, however, reflects a fundamental misunderstanding of the applicable legal standards, site data, and the technical approaches used by the Regional Board in the DTR. As set forth more fully below, the Regional Board applied the correct legal standard, based its finding that cleanup to background is not economically feasible on a well-reasoned analysis of cost effectiveness, and set appropriate cleanup levels that do not unreasonably impair the beneficial uses of the water. For these reasons, which are more fully addressed below, SDC and EHC's comments lack credence and should be rejected.

**Comment ID:** 419  
**DTR Section:** 32.1

**Organization:** BAE Systems

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

II.REPLY TO SECTION I. THE LAW REQUIRES CLEANUP TO BACKGROUND EXCEPT  
WHERE EVIDENCE IN THE RECORD DEMONSTRATES THAT ALTERNATIVE  
CLEANUP LEVELS GREATER THAN BACKGROUND WATER QUALITY ARE  
APPROPRIATE.

A.Reply to Comment I.A. Cleanup to a Pollutant Level Greater than Background Conditions  
is Only Allowed if the Regional Board Makes Two Findings.

SDC and EHC contend there is a rebuttable presumption of cleanup to background or the  
most economically feasible cleanup alternative. The Act and implementing regulations,  
however, do not support their position. Rather, where background is not technologically or  
economically feasible, the Regional Board is only required to set an alternative cleanup level  
where the beneficial uses of the water are not unreasonably impaired.

First, SDC and EHC’s position fails to recognize that if the alternative cleanup level does not unreasonably affect the beneficial uses, it is not considered “a condition of pollution or nuisance,” which is a prerequisite to the Regional Board’s exercise of authority under the Act. See Cal. Water Code § 13304(a). The California Water Code, as well as the Federal Clean Water Act, recognize that industrial discharges are acceptable as long as they do not unreasonably impair other beneficial uses. See, e.g., *S. Fl. Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, 102 (2004) (noting that “the [Federal Clean Water] Act prohibits ‘the discharge of any pollutant by any person’ unless done in compliance with some provision of the Act”). As more fully explained below and in BAE Systems’ May 23, 2011 Comments, Site sediments do not pose any unacceptable risk to aquatic life, aquatic-dependent wildlife, or human health, and do not unreasonably affect the beneficial uses of the water. Because the alternative cleanup levels set forth in the DTR do not unreasonably affect the beneficial uses of the water, they are acceptable.

Second, the Regional Board is not required to determine the appropriate cleanup level irrespective of the associated costs with cleanup. In fact, the Regional Board is required to balance the impact on the environment against the technological and economical costs associated with a cleanup to determine a level of remediation that is reasonable and cost-effective. For example, California Water Code § 13304 requires dischargers to either “clean up the waste or abate the effects of the waste . . . .” Cal. Water Code § 13304(a) (emphasis added). This makes it clear that abatement of the effects of waste, rather than remediation to background, can accomplish the goals of the Porter-Cologne Water Quality Control Act in the same manner as remediation to background. The State Water Board’s guidance is no different. Specifically, State Water Board Resolution No. 92-49 does not require cleanup to background unless it is both technologically and economically feasible: the Regional Board “shall . . . ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible . . . .” State Water Board Resolution No. 92-49, § III(G) (emphasis added).

Similarly, the Act requires that the State Water Board develop guidelines and procedures for regional boards that “include . . . [p]rocedures for identifying and utilizing the most cost-effective methods . . . for cleaning up or abating the effects of contamination or pollution.” Cal. Water Code § 13307(a)(3). This makes clear that abating the effects of contamination must be tempered by cost considerations. Thus, contrary to SDC and EHC’s position, the DTR correctly states that the Water Code permits “an alternative cleanup level less stringent than background sediment chemistry concentrations if attainment of background concentrations is technologically or economically infeasible – as long as the less stringent cleanup level is protective of beneficial uses.” (DTR § 32.1.) As set forth more fully below, there is substantial evidence that (1) cleanup to background is not technologically or economically feasible, (2) the alternative cleanup level is protective of the beneficial uses at the site, and (3) monitored natural attenuation is the most cost-effective method for achieving the cleanup goals articulated in the TCAO.

**Comment ID:** 420  
**DTR Section:** 32.1

**Organization:** BAE Systems

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION I. THE LAW REQUIRES CLEANUP TO BACKGROUND EXCEPT WHERE EVIDENCE IN THE RECORD DEMONSTRATES THAT ALTERNATIVE CLEANUP LEVELS GREATER THAN BACKGROUND WATER QUALITY ARE APPROPRIATE.

B.Reply to Comment I.B. Alternative Cleanup Levels Must Be a Concentration Limit Set on a Constituent-by-Constituent Basis and Must Meet Requirements in State Water Board Resolution No. 92-49.

SDC and EHC argue that the Regional Board is required to set a concentration limit, and that this must be done on a constituent-by-constituent basis. In support of their position, SDC and EHC rely on § 2550.4 of Title 23 of the California Code of Regulations. While it is true that State Board Resolution No. 92-49, in part, incorporates the provisions of Chapter 15, the State Water Board advises implementation of those provisions only if the cleanup and abatement “involves corrective action at a waste management unit regulated by waste discharge requirements issued under Chapter 15.” State Water Board Resolution No. 92-49, § III(F)(2) (emphasis added). Furthermore, Chapter 15, which is titled “Discharges of Hazardous Waste to Land,” states in pertinent part:

The regulations in this article apply to owners or operators of facilities that treat, store, or dispose of hazardous waste at Class I waste management units. . . . Furthermore, § 2550.4 of this article also applies to all determinations of alternative cleanup levels for unpermitted discharges to land of hazardous waste, pursuant to ¶ III.G. of SWRCB Resolution No. 92-49 . . . .

Calif. Code Regs. tit. 23 § 2550.0. The designated parties in the instant proceedings are not considered Class I waste management units, nor do the determinations at issue here relate to unpermitted discharges to land. Furthermore, the provisions contained within Chapter 15 were clearly designed to be instructive guidelines for waste treatment, storage, and disposal facilities, not for sediment remediations. Technical elements for establishing water quality protection standards, monitoring programs, and corrective action programs for releases from waste management units, like those set forth in Chapter 15, are simply not useful in the context of sediment remediation. Thus, to the extent Section 2550.4 addresses concentration limits or constituent-specific cleanup, it is limited to the context of waste discharge and monitoring requirements, and does not apply here.

To the extent that Section 2550.4 does apply, it does so only to reinforce the guidance contained in Resolution No. 92-49, and the general requirement that alternative cleanup levels set above background levels adequately protect the beneficial uses of the water. As already explained, the Regional Board is required only to ensure that the cleanup levels ultimately ordered are economically feasible and adequately protective of the beneficial uses. See, e.g., State Water Resources Control Board Memorandum From Craig Wilson To John Robertus (February 22, 2002), at SAR097571- 81 (“Wilson Memo”) (noting that Resolution 92-49 is flexible and making no mention of any requirement to set alternative cleanup levels or analyze economic or technological feasibility on a constituent-by-constituent basis) Contrary to SDC

and EHC's position, meeting the standard of Resolution No. 92-49 does not require that cleanup levels be set or economical feasibility be assessed on a constituent-by-constituent basis. Tellingly, SDC and EHC fail to point to any decisions or other CAOs where the Regional Board, or another tribunal, construed Resolution No. 92-49 in such a way.

Finally, and perhaps most importantly, requiring remediation on a constituent-by-constituent basis irrespective of economic feasibility, as urged by SDC and EHC, would likely result in remediation at a level more stringent than background. Not only is this not required under the Act, Resolution 92-49 specifically forbids it: "under no circumstances shall these provisions be interpreted to require cleanup and abatement which achieves water quality conditions that are better than background conditions." (Section III(F)(1) (emphasis added).)

As discussed more fully below, the DTR sets alternative levels on a constituent-by-constituent basis for both primary COCs and secondary COCs, and does so after a careful weighing of the objectives of the Act against the economic feasibility of remediating to background. Accordingly, SDC and EHC's position that the DTR is inadequate in this regard should be rejected.

**Comment ID:** 421

**Organization:** BAE Systems

**DTR Section:** 31

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION I. THE LAW REQUIRES CLEANUP TO BACKGROUND EXCEPT WHERE EVIDENCE IN THE RECORD DEMONSTRATES THAT ALTERNATIVE CLEANUP LEVELS GREATER THAN BACKGROUND WATER QUALITY ARE APPROPRIATE.

C.Reply to Comment I.C. The Regional Board's Findings Must be Supported By Evidence in the Record.

SDC and EHC correctly note that the Regional Board's findings must be supported by the weight of the evidence in the record. Their position, however, that the Regional Board's alternative cleanup levels are insufficiently protective, and the corresponding implication that cleanup to background on a constituent-by-constituent basis is technologically and economically feasible, are without merit. As set forth more fully below, the Regional Board has complied with the State Water Board Resolution No. 92-49 in setting alternative cleanup levels that do not unreasonably interfere with the beneficial uses of the water and are economically feasible.

See BAE Rebuttal Comment ID 422, 423, 424

**Comment ID:** 422

**Organization:** BAE Systems

**DTR Section:** 31

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

**III. REPLY TO SECTION II. THE ORDER'S CONCLUSION THAT CLEANUP TO BACKGROUND WATER QUALITY LEVELS IS ECONOMICALLY INFEASIBLE IS ARBITRARY AND CAPRICIOUS AND NOT SUPPORTED BY SUBSTANTIAL EVIDENCE IN THE RECORD.**

Contrary to SDC and EHC's position, the Regional Board and the other Designated Parties have complied with the State Water Board Resolution No. 92-49. As already noted, the law allows designated parties to remediate a site based on alternative cleanup levels, rather than to background, if the parties can demonstrate that it is economically infeasible to remediate a site to background. Not only do the TCAO and accompanying DTR demonstrate that it is economically infeasible to remediate the site to background, but two other experts, Arcadis, Inc. ("Arcadis") and Integral Consulting, Inc. ("Integral"), have also so opined. Arcadia and Integral used different methodologies to assess cost-effectiveness than did the Regional Board but nonetheless each derived the same conclusion. Cleanup to background was not only substantially more expensive to achieve than cleaning to the DTR's established cleanup levels, but also cleaning to background is substantially less cost-effective than cleaning to the DTR-established cleanup levels.

SDC and EHC argue that the alternative cleanup levels set forth in the TCAO and the DTR are not appropriately protective of the Bay's beneficial uses. SDC and EHC submit an analysis that primarily focuses on the efficacy of the alternative cleanup standards as opposed to analyzing whether achieving background sediment quality is economically feasible. It is only the latter question, whether cleanup to background is economically feasible, that must be answered in assessing whether the Designated Parties have appropriately met the terms of State Water Board Resolution No. 92-49.

**Comment ID:** 423

**Organization:** BAE Systems

**DTR Section:** 31 Figure 31.1

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS REPLY TO SECTION II. THE ORDER'S CONCLUSION THAT CLEANUP TO BACKGROUND WATER QUALITY LEVELS IS ECONOMICALLY INFEASIBLE IS ARBITRARY AND CAPRICIOUS AND NOT SUPPORTED BY SUBSTANTIAL EVIDENCE IN THE RECORD.

**A. The DTR's Economic Feasibility Analysis.**

Section 31 of the DTR sets forth the Regional Board's analysis of the economic feasibility of cleaning the site to background. On May 20, 2011, the Regional Board made clear in its answers to questions posed by SDC and EHC that "[t]he objective of section 31 [of the DTR] is to determine whether achieving background sediment quality is economically feasible – not what the cleanup levels will be." See May 20, 2011 Response to San Diego Coastkeeper and Environmental Health Coalition Economic Feasibility Questions. The Regional Board evaluated a number of criteria to determine risks, costs, and benefits associated with no action, cleanups to

background sediment chemistry levels, and alternative cleanup levels greater than background concentrations. (See DTR Finding 31.) The criteria included factors such as total cost, volume of sediment dredged, the exposure pathway of receptors to contaminants, short- and long-term effects on beneficial uses (as they fall into the broader categories of aquatic life, aquatic-dependent wildlife and human health), effects on shipyards and associated economic activities, effects on local businesses and neighborhood quality of life, and effects on recreational, commercial, or industrial uses of aquatic resources. The Regional Board then compared these cost criteria against the benefits gained by diminishing exposure to the primary COCs to estimate the incremental benefit gained from reducing exposure based on the incremental cost of doing so. (DTR Finding 31.) This comparison revealed that the incremental benefit of cleanup diminishes significantly with additional costs beyond a certain cleanup level, and asymptotically approaches zero as remediation approaches background. (Finding 31 of the DTR.) Based on those considerations, the DTR concludes that cleaning up to background chemistry sediment levels is not economically feasible.

The Regional Board assessed economic feasibility by ranking the 65 shipyard sediment stations according to the contaminant levels found in surficial sediment samples. This process used Triad data and site-specific median effects quotient (SS-MEQ). (DTR Finding 31.) The Regional Board then evaluated a series of cumulative cost scenarios by starting with the six most contaminated stations, then adding the six next-most contaminated stations, progressing sequentially down the list until the entire Shipyard Sediment Site was included in the scenario. (See appendix for DTR Finding 31.)

The following chart measures the incremental benefit from cleaning up various polygons, cleaning 66 polygons on a worst basis first. The benefit of remediating polygons is in exposure reduction per \$10 million of cost. The chart further measures the likely cost, per million dollars, to clean up the various polygons.

Table 1

The Regional Board concluded that initial expenditures returned a relatively high exposure reduction benefit, but additional expenditures yield progressively lower returns per dollar spent on remediation. Figure 1, which is an accurate reflection of Figure 31-1 in the DTR, graphically demonstrates the percent exposure reduction versus remediation dollars spent.

Figure 1 Percent Exposure Reduction versus Remediation Dollars Spent

The highest net benefit per remedial dollar spent occurs for the first \$33,000,000 (18 polygons remediated), based on the fact that initial exposure reduction is above 12% per \$10,000,000 spent. Beyond \$33,000,000, however, the exposure reduction per dollar spent drops consistently as the cost of remediation increases. For cleanup to background, overall exposure reduction is only 3.5% per \$10,000,000 spent, and there is effectively no net exposure reduction for the last sets of polygons that would be included in such a remediation. Figure 2 illustrates the increasing costs and diminishing benefits associated with cleanup to background. Data shown in this figure are from Table 1.

Figure 2

The data table above shows the incremental and cumulative benefits and costs of conducting a sequential, “worst-first” cleanup of shipyard sediments. Remediation of the polygons with the highest chemical concentrations—those in the upper left of the figure—would yield not only the greatest exposure reduction (more than 12% for each set of polygons), but also the most cost-effective cleanup. Remediation of the polygons in the lower right of the figure, which would be the last addressed in a cleanup to background, would produce little or no exposure reduction, yet would be among the most costly to clean up. The marginal benefit of cleaning up to background is small or zero, whereas the marginal costs are the highest.

Further expenditures eventually reach a point where exposures reduction benefits become negligible. SDC and EHC assert that the Regional Board needs to identify the exact point where exposure reductions become negligible. The Regional Board is not so required. The objective of Finding 31 is merely to determine whether achieving background sediment quantity is economically feasible. It is sufficient to point where the incremental cost of achieving further reductions and contaminant concentrations exceed the incremental benefit of so doing.

In several of their comments, SDC and EHC claim that cleanup scenarios costing more than the remedial footprint identified in the DTR are, or may be, economically feasible. Included in these comments is the criticism that the grouping scenarios in Figure 31-1 of the DTR (Figure 1 above) have obscured the relationship between costs and benefits. These comments are based on a desire to analyze individual alternative cleanup levels rather than to address the essential question before the Regional Board, whether achieving background sediment quality is economically feasible.

The Regional Board therefore correctly concluded that, based on the incremental costs versus incremental benefits, cleanup to background sediment quality levels is not economically feasible. In addition to evaluating incremental cost effectiveness, as illustrated in the preceding figure and discussion, the data in Table 1 can also be used to calculate the overall cost effectiveness of each scenario. Overall cost effectiveness refers to the total exposure reduction per million dollars spent for an entire cleanup scenario rather than for incremental areas of a cleanup. This measure of cost effectiveness can then be contrasted with the total cost of each different scenario as shown in the following figure.

Figure 3

Cost effectiveness, expressed as the fractional reduction in exposure per million dollars spent, is shown in the Y axis of Figure 3. Cost is shown on the X axis. The data points are those tabulated in the May 20, 2011 Response to San Diego Coastkeeper and Environmental Health Coalition’s Economic Feasibility Questions.



In this figure, the polygons at the upper left have the highest chemical concentrations, and thus are the most cost-effective to remediate. Cost effectiveness decreases steeply for more extensive remedial scenarios. Moving from left to right across this figure (i.e., to successively larger cleanup areas), a consistent drop in cost effectiveness is seen. This occurs even though the larger scenarios include the areas that are most cost-effective to remediate. As with the evaluation of incremental cost effectiveness, overall cost effectiveness drops most rapidly after the first three groups of polygons have been remediated. The decreasing cost-effectiveness with increasing costs is the basis of the Regional Board's determination that cleanup to background is not cost effective. This is summarized in Section 32.7.1 of the DTR as follows: "The highest net benefit per remedial dollar spent occurs for the first \$33,000,000." After this point, the cost effectiveness of further dredging actions drops steeply. Cleanup scenarios costing more than approximately \$33,000,000 (which corresponds to the proposed remedy) are considerably less cost effective. Cleanup to background is only about one third as cost effective as the proposed remedy, at a cost that is almost ten times higher. The Regional Board's determination that cleanup to background is not economically feasible relative to the proposed remedial footprint is well supported by the analysis of cost effectiveness.

**Comment ID:** 424

**Organization:** BAE Systems

**DTR Section:** 31

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS REPLY TO SECTION II. THE ORDER'S CONCLUSION THAT CLEANUP TO BACKGROUND WATER QUALITY LEVELS IS ECONOMICALLY INFEASIBLE IS ARBITRARY AND CAPRICIOUS AND NOT SUPPORTED BY SUBSTANTIAL EVIDENCE IN THE RECORD.

B.Additional Economic Feasibility Analysis Confirm Cleaning to Background Is Not Economically Feasible

Arcadis and Integral undertook two additional economic feasibility analyses, and while they used slightly different methodologies, both concluded that a cleanup based on the DTR's alternative cleanup standards was far more cost effective than cleaning to background.

1.Arcadis Evaluation.

Arcadis, in its March 11, 2011 Expert Report on Economic Feasibility Shipyard Settlement Site ("Arcadis Report"), presented cost and benefit information for three alternative cleanup scenarios: the DTR-recommended Option, cleanup to background ("Background Remedial Option"), and cleanup to a third alternative ("Alternative Remedial Option"). The Alternative remedial Option establishes alternative cleanup standards that are protective of designated beneficial uses by eliminating the shipyards as designated impaired waterways under the Clean Water Act. Arcadis applied an Office of Management and Budget cost-effectiveness guidance analysis in evaluating its three options. Arcadis' analysis of the first two options is similar in approach to those used by the Regional Board in the DTR. The approach for implementing the Alternative Remedial Option is similar to the approach provided for the other two options, with the exception of exhibiting a reduced remedial footprint. Under the Alternative Remedial

Option, 12 polygons will be targeted for remediation as compared to 23 polygons for the DTR-recommended Option and 66 for the Background Remedial Option.

As is allowed under State Water Board Resolution No. 92-49, Arcadis' analysis included consideration of social costs, habitat impacts and business costs associated with the different cleanup options. Arcadis' analysis of non-dredge related costs was premised on an assumption that a remediation project of this magnitude would necessarily generate social costs that the Regional Board did not factor into its economic feasibility analysis. Such costs include impacts on the community, habitat, and businesses. The magnitude and duration of these impacts is directly related to the size and duration of the selected remedial option. (Arcadis 2011.) Potential community impacts associated with remedial implementation include noise, increased traffic, air quality, and the potential for release of contaminants into the bay. The Alternative Remedial Option would have a little less than half of the trucks and mileage required for the DTR-recommended option and approximately 6% of the trucks and mileage required for the Background Remedial Option. The DTR-recommended option will require 12% of the trucks and mileage required for the Background Remedial Option. In short, the Background Remedial Option would have a significantly larger impact on traffic than the other two options, leading to significantly greater risks of accidents and accident-related injuries. (Arcadis 2011.)

Dredging will resuspend contaminated sediment which will act to elevate the suspended solids and the concentration of contaminants in the water column. While remedial design will include measures to reduce the potential for suspension, resuspension cannot be eliminated completely. The potential for resuspension is a function of remedial method and quantity and will therefore be far greater for the Background Remedial Option than the other two remedial options. Furthermore, the Background Remedial Option would have the greatest potential for air emissions over the impact period of time.

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The three remedial options would have varying degrees of impact on the habitat. The Background Remedial Option may impact as much as 25% to 30% more eelgrass beds than the DTR-recommended Option. (Arcadis (2011) at 26.) Furthermore, dredging may have other habitat effects. For example, the increase in water depth may reduce the food available to diving ducks, such as the surf scoter.

Arcadis identifies many of the ways in which the Background Remedial Option, due to the length and breath of remedial activity, will affect the shipyards. Because the shipyards at the Site are the only shipyards in California that are capable of providing both dry docking and pier-side berthing, interruptions and delays in ship construction/maintenance activities could affect the shipyard's ability to fulfill many contracts. Inabilities to fully utilize shipyard assets could have significant financial implications to the shipyards themselves, their employees, and the community's tax base. (See Arcadis (2011) at 27-28.)

Benefits were expressed in terms of proportional reduction in the surface area-weighted average concentration ("SWAC") relative to background—i.e., the same general approach as the DTR. Arcadis found that costs relative to benefits increased disproportionately for a cleanup to background when compared to the cleanup recommended in the DTR.

Figure 4 below, which is an accurate replication of Figure 5 in the Arcadis report, demonstrates the incremental costs and incremental reduction in exposure relative to background levels, measured in percent of the five primary COCs for the increasingly larger remedial footprints. The cost per exposure reduction (measured relative to background levels) increased from about \$900,000 under the Alternative Remedial Option (smallest remedial footprint) to

about \$2,300,000 under the DTR-recommended Option. The incremental cost per exposure reduction under the Background Remedial Option increased to almost \$4,400,000 (using a 3% discount rate). The incremental cost per exposure reduction increases in cost by almost 100%, if a cleanup to background is commenced. The differential in cost per exposure reduction increases even more when social, habitat and business impacts are factored into the analysis.

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Figure 4

## 2. Integral Evaluation.

Integral, in its March 11, 2011 Evaluation of Alternative Cost Effectiveness Calculation Approaches for the Remedial Alternatives of the San Diego Shipyard Site, presented further analysis of these alternatives, including three different methods of assessing chemical-specific cost effectiveness. Integral calculated (in three different ways) the chemical-specific cost effectiveness for each of the primary COCs identified in the DTR. The fractional reduction in the SWAC per million dollars spent was used as the measure of effectiveness. Chemical specific cost-effectiveness for the three alternatives evaluated is illustrated in Figure 5 below, which is a replication of Table 3 in the Integral report. Three data points are shown in this figure for every chemical. These data points correspond to the three different remedial options evaluated: Arcadis' Alternative Remedial Option, the DTR-recommended Option, and cleanup to background, in order by increasing cost. In this figure the Y axis represents the cost effectiveness of each remedial alternative, expressed as the fractional reduction in SWAC per million dollars spent. The X axis is the cost for the three different remedial options. For each of the five COCs, the highest cost effectiveness is achieved with Arcadis' Alternative Remedial Option, moderate cost effectiveness is achieved with the DTR-recommended alternative, and the lowest cost effectiveness is associated with the cleanup to background.

Figure 5

These results of chemical-specific cost effectiveness calculations show that the DTR-recommended Option is less cost-effective than Arcadis' Alternative Remedial Option, but is more cost effective than cleanup to background for all chemicals. This conclusion is consistent across all methods of interpreting cost effectiveness. Further, it is important to note that none of these methods of interpreting cost effectiveness account for the social costs, such as the impact to the community, habitat, and businesses, that will be generated as a result of the cleanup level ultimately adopted by the Regional Board. Therefore, it is likely that the actual costs associated with each of the available options are understated, and the lack of cost effectiveness of cleaning to background is that much greater when all remediation costs, social and actual, are fully taken into account. Nevertheless, consistent with the determination in the DTR that cleanup to the proposed footprint is more economically feasible than cleanup to background, cleanup to the proposed footprint is more cost effective for each of the primary COCs at the Shipyard Site.

**Comment ID:** 425  
**DTR Section:** 34

**Organization:** BAE Systems

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

IV.REPLY TO SECTION III. THE ORDER FAILS TO MEET LEGAL REQUIREMENTS  
FOR CLEANUP TO POLLUTANT LEVELS GREATER THAN BACKGROUND.

•SDC and EHC assert that “the monitoring plans—both during and post-remediation—do  
not actually require that the alternative cleanup levels be met.”

The statement is false, because the monitoring plans require the Alternative Cleanup Levels to  
be met within the constraints imposed by the natural variability typically encountered when  
making measurements of sediment chemical concentrations in environmental samples.

**Comment ID:** 426

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION III. THE ORDER FAILS TO MEET LEGAL REQUIREMENTS FOR  
CLEANUP TO POLLUTANT LEVELS GREATER THAN BACKGROUND.

A.Reply to Comment III.A. The Site-Wide Alternative Cleanup Levels Were Calculated Based  
on Remediating to Background Pollutant Levels.

•SDC and EHC assert that “the cleanup must ensure that remediated areas are cleaned to  
background conditions or cleaner.”

The TCAO does specify that the remediated areas be cleaned to background conditions within  
the constraints imposed by the natural variability typically encountered when making  
measurements of sediment chemical concentrations in environmental samples.

**Comment ID:** 427

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION III. THE ORDER FAILS TO MEET LEGAL REQUIREMENTS FOR  
CLEANUP TO POLLUTANT LEVELS GREATER THAN BACKGROUND.

B.Reply to Comment III.B. The Remediation Monitoring Fails to Require Remedial Areas to Achieve Background Levels.

•SDC and EHC assert that “the Order and DTR set out a process that allows the remediated areas to be 20% more polluted than background pollutant levels.”

As explained in the DTR, the rationale for the 120% background rule is to address the natural variability typically encountered when making measurements of sediment chemical concentrations in environmental samples. This rationale is appropriate, given the technical constraints imposed by environmental sampling and analysis.

1.Reply to Comment III.B.1. The “120% of background” could lead to site-wide pollutant concentrations above the Alternative Clean-up Levels.

•SDC and EHC assert that “the DTR and record present no evidence demonstrating that site-wide remediation goals will be met if the concentrations of pollutants in all of the remediated areas are at 120% of background levels.” SDC and EHC note that the Site-wide SWACs for all five COCs would exceed their Alternative Cleanup Levels. SDC and EHC then state that the 120% background rule is “arbitrary and capricious and fails to ensure that alternative cleanup levels are achieved.”

The DTR clearly states that the rationale for the 120% background rule is to address the natural variability in sediment chemical concentrations found in the environment. As stated in Section 34 of the DTR, “Environmental data has natural variability which does not represent a true difference from expected values. Therefore, if remedial monitoring results are within an acceptable range of the expected outcome, the remedial actions will be considered successful.” The 120% background rule is therefore an appropriate recognition of the realities of environmental sampling and analysis.

The SDC and EHC analysis presented in Table 2 of the comments is flawed because it is based on the highly improbable scenario that concentrations of all five primary COCs would be found at 120% of their background levels throughout the entire remedial footprint. A much more likely scenario is that only a subset of the COCs would be found at 120% of their background levels, and that this would occur only in a portion of the footprint rather than throughout the entire area. Even if the highly unlikely scenario presented in Table 2 of the SDC and EHC comments is found, the magnitude of the exceedance of the Alternative Screening Cleanup Level for each COC is very small, ranging from 0.6 to 1.5 %. To illustrate this fact, the Alternative Cleanup Level for each COC and the Site-wide post-remediation SWAC calculated by SDC and EHC are presented below in that order:

- Copper: 159 vs. 161 mg/kg;
- Mercury: 0.68 vs. 0.69 mg/kg;
- HPAHs: 2,451 vs. 2,466 ug/kg;
- Total PCBs: 194 vs. 196 ug/kg; and
- TBT: 110 vs. 111ug/kg.

These differences are not only within the range of natural variability, they are within the range of measurement (laboratory) variability for these chemicals. Therefore, exceedances of the Alternative Cleanup Levels under the most extreme conditions possible at the Site would not substantially increase risks to aquatic receptors.

2.Reply to Comment III.B.2. The Regional Board cannot approve the Order and DTR with the 120% of background second-pass rule because it fails to ensure that Alternative Cleanup Levels will not be exceeded.

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•SDC and EHC (2011) state that “To make the alternative cleanup levels concentration limits, the Order must ensure that remediated areas are remediated to background pollutant concentrations.”

This assertion is invalid. The TCAO does specify that the remediated areas be cleaned to background conditions within the constraints imposed by the natural variability typically encountered when making measurements of sediment chemical concentrations in environmental samples.

3.Reply to Comment III.B.3. The “120% of background” decision rule violates the Order’s corrective action directive.

•SDC and EHC state that attainment of the Alternative Cleanup Levels “can only be guaranteed if the remedial areas achieve background pollutant levels, the 120% background dredging trigger violates the Order’s remediation directive.”

As discussed previously, the 120% background rule appropriately addresses the reality of natural variability of sediment chemical concentrations in the environment. The assertion by SDC and EHC is therefore incorrect.

4.Reply to Comment III.B.4. The “120% of background” decision rule for a second dredging pass is ambiguous.

•SDC and EHC state that “the language in the Order setting the 120% background level allowance leaves open the possibility that every Contaminant of Concern had to exceed 120% of background in order to warrant a second dredging pass.”

The assertion is incorrect since the TCAO clearly states in Section A.2.a that “the dredging shall remediate the sediment in the dredge remedial area to the concentrations in the table below for primary COCs.” The table referred to in the TCAO statement presents the Post-Remediation Dredge Area Concentration for each of the five primary COCs. It, therefore, is clear that if any one of the five COCs exceeds its Post-Remediation Dredge Area Concentration, corrective action will be evaluated. The SDC and EHC assertion is incorrect.

**Comment ID:** 428

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.’S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION’S COMMENTS

REPLY TO SECTION III. THE ORDER FAILS TO MEET LEGAL REQUIREMENTS FOR  
CLEANUP TO POLLUTANT LEVELS GREATER THAN BACKGROUND.

C.Reply to Comment III.C. The Post Remedial Monitoring Fails to Evaluate Whether  
Alternative Cleanup Levels are Achieved.

This comment is invalid for the reasons provided below.

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1. Reply to Comment III.C.1. The Order sets the “Remedial Goals” as compliance with “Trigger Concentrations” above the Alternative Cleanup Levels—and in some cases ABOVE existing pollutant levels.

•SDC and EHC state that “because the Order sets the remediation goals as compliance with the “Trigger Concentration” instead of the alternative cleanup levels, the Order is actually setting the “Trigger Concentration” as the concentration limit for each pollutant.”

SDC/EHC statement is erroneous. It fails to recognize the natural variability encountered when measuring sediment chemical concentrations in the environment. As stated in Section 34 of the DTR, “Environmental data has natural variability which does not represent a true difference from expected values.” Therefore, the Trigger Concentrations were appropriately designed to address the degree of natural variability expected to be found associated with measurements of the Alternative Cleanup Levels at the Shipyard Site, based on the area-weighted variability of the measured COC concentrations in the non-remediated areas. If the Trigger Concentrations were actually the concentration limits for each COC, as SDC and EHC assert, then higher Trigger Concentrations would be necessary to accommodate the degree of natural variation expected to be found associated with the chemical measurements.

2Reply to Comment III.C.2. The Post Remedial Monitoring program will mask ongoing pollutant problems.

•SDC and EHC state that “Given the current design of the program, the Regional Board will not be able to assess whether the alternative cleanup levels were achieved and the remediation was successful.”

SDC and EHC’s statement is incorrect. The TCAO and DTR specify a robust post-remediation monitoring program comprised of multiple lines of evidence that address sediment chemical concentrations and potential biological effects. For example, sediment chemistry samples will be collected from all 65 polygons at the Shipyard Site, and composited into six groups to evaluate SWACs for the five primary COCs. The stratification scheme for sediment compositing will provide valuable interpretive information on the spatial distribution of COC concentrations throughout the site that would not be available if only a single site-wide SWAC was evaluated.

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In addition, the five stations selected for the combined evaluations of sediment chemistry and sediment toxicity were the only five stations in the remedial footprint found to have likely impairment based on the Triad analyses described in the DTR. (See DTR Finding 18.). Therefore, they represent the highest priority areas for remediation, and are appropriately identified for monitoring of sediment chemistry and toxicity to evaluate benthic exposure. Finally, bioaccumulation will be evaluated at nine stations distributed along the entire length of the remedial footprint, and will provide a relatively complete assessment of potential bioaccumulation throughout the site. In addition, the specified bioaccumulation test (i.e., the 28-day test with *Macoma nasuta*) has been proven to be an effective tool for evaluating bioaccumulation from sediment in other studies.

a.Reply to Comment III.C.2.a. The Post Remedial Monitoring program fails to require samples from each polygon at the site.

- SDC and EHC state that “the sediment sampling requirements described in the Order will provide data on the average levels of five pollutants in the top 2 cm of sediment contained within only six polygon groups. This means that the Order fails to require the Dischargers to collect data needed to evaluate whether the clean-up goals have been met for the whole site.”

This statement is incorrect. Because the stratification scheme described in Section 32.2.1 of the DTR will subdivide the overall Shipyard Site into six polygon groups, it will allow SWACs to be calculated for those different subsections of the site, as well as for the overall site. This stratification scheme will provide valuable interpretive information on the spatial distribution of COC concentrations throughout the site, which would not be available if only a single site-wide SWAC was evaluated. The six polygon groups include three polygons in each of the northern and southern halves of the overall site, and the three polygons within each half of the overall site represent the remedial footprint, the polygons adjacent to or proximal to the remedial footprint, and the polygons distant from the footprint. Therefore, contrary to SDC and EHC’s assertion, the stratification and compositing scheme specified in the DTR will document the true spatial extent of COC concentrations throughout the Shipyard Site, rather than mask that distribution.

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b.Reply to Comment III.C.2.b. Compositing surface sediment into six polygon groups will mask the true extent of contamination remaining at the Shipyard Sediment Site.

- SDC and EHC state that “the Post Remedial Monitoring plan will not provide the data to verify whether the remediation has been effective in protecting human health and aquatic-dependent wildlife.”

As described in the response to Comment III.C.2.a above, the stratification scheme that will be used at the Shipyards Site will provide valuable interpretive information on the spatial distribution of COC concentrations throughout the site that would not be available if only a single site-wide SWAC was evaluated.

3.Reply to Comment III.C.3. Failure to assure that the Alternative Cleanup Levels are met through the remediation process renders the cleanup illegal.

- SDC and EHC state that “the Order allows the cleanup to achieve a less-stringent “Trigger Concentration” level of pollutant that effectively sets the cleanup levels significantly higher than background pollutant levels.”

As described in the response to Comment III.C.1, the Trigger Concentrations were appropriately designed to address the degree of natural variability expected to be found associated with measurements of the Alternative Cleanup Levels at the Shipyard Site. If the Trigger Concentrations were actually the cleanup levels, as SDC and EHC assert, higher Trigger Concentrations would be necessary to accommodate the degree of natural variation expected to be found associated with the chemical measurements. SDC and EHC’s assertion is therefore invalid.

- SDC and EHC also state that “exceeding the “Trigger Concentrations” does not actually trigger any additional remediation.”



SDC and EHC's statement is incorrect. As stated in Section D of the TCAO, the purpose of the Trigger Exceedance Investigation and Characterization is "to determine the cause(s) of the exceedance" and to recommend "an approach, or combination of approaches, for addressing the exceedance(s)." The TCAO therefore lays out a rational approach with numerous details to evaluate the underlying cause of any exceedance of a Trigger Concentration, so that it can be addressed in the present, and prevented in the future. The Regional Board will review all of this information and determine the best path forward. SDC and EHC's implication that the process is flawed is therefore invalid.

**Comment ID:** 429

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

V.REPLY TO SECTION IV. THE PROPOSED CLEANUP FAILS TO REQUIRE THE BEST  
WATER QUALITY REASONABLE.

This comment is invalid for the reasons provided below.

A.Reply to Comment IV.A. Narrative Alternative Cleanup Levels for Aquatic Life Cannot  
Ensure that These Beneficial Uses will not be Unreasonably Affected at the Shipyard Sediment  
Site.

•SDC and EHC state that "without appropriate numeric limits for fish and benthic invertebrates,  
there will be no way to quantitatively measure compliance with measures to protect fish and  
benthic invertebrates."

The statement implies that sufficient information will not be collected in the post-remediation  
monitoring program to protect benthic macroinvertebrates and fish. As discussed previously, the  
monitoring program is comprised of multiple lines of evidence that address sediment chemical  
concentrations and potential biological effects. The evaluations of biological effects will include  
direct measurements of sediment toxicity (i.e., using the 10-day amphipod survival test with  
*Eohaustorius estuarius*, and the 48-hour bivalve larvae development test using the mussel  
*Mytilus galloprovincialis*) and bioaccumulation (i.e., using the 28-d test with the clam *Macoma  
nasuta*). In addition, sediment chemical concentrations will be compared with site-specific  
sediment quality values designed to be protective of benthic macroinvertebrate communities (i.e.,  
the SS-MEQ and the 60% LAET values). The concerns for fish are unwarranted because risks to  
fish were not found to be an issue at the Shipyard Site under baseline conditions, based on  
extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as  
the key indicator species (Exponent 2003).

**Comment ID:** 430

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION IV. THE PROPOSED CLEANUP FAILS TO REQUIRE THE BEST  
WATER QUALITY REASONABLE.

This comment is invalid for the reasons provided below.

B.Reply to Comment IV.B. The Proposed Remedial Footprint is Too Small to Ensure that the Remaining Pollutant Levels will not Unreasonably Affect Present and Anticipated Beneficial Uses of San Diego Bay.

This comment is invalid for the reasons provided below.

1.Reply to Comment IV.B.1. Problems with the development of the Proposed Remedial Footprint results in a cleanup that achieves less than the best water quality reasonable.

SDC and EHC make numerous statements under this comment. Responses to each of those statements are presented below.

•SDC and EHC (2011) state that “an insufficient number of samples were collected to accurately determine the nature and extent of contamination at the 148-acre Shipyard Site, given the variability of contaminants at the site.”

This assertion is incorrect. The station distribution scheme was consistent with the manner in which most schemes are designed at contaminated sediment sites. That is, stations are distributed with the highest density near sources where the highest COC concentrations are expected (especially in depositional environments), and with lower densities in areas removed from the sources, where contaminants are expected to be more widely dispersed by waves and currents. At the Shipyard Site, it was expected that most contaminant sources would be located near the shoreline, and that the piers would create depositional environments that would facilitate deposition of contaminants near the sources, resulting in patchy distributions with elevated concentrations. In contrast, contaminant sources were not expected to be found outside the pier lines, and in those locations, contaminants would be dispersed by waves and currents in San Diego Bay, and their concentrations in sediments would be lower and more evenly distributed. Therefore, most of the 65 stations (i.e., 43) at the Shipyard Site were located within the pier line of the site, and the station distribution scheme was consistent with the scheme commonly used at contaminated sediment sites.

Moreover, the sediment chemistry results of the 2001/2002 sampling at the Shipyard Site confirmed the assumptions used to design the station distribution scheme. That is, the chemical concentrations presented in Table A33-3 of the DTR and the concentration contours presented in Figures 4-3 to 4-21 of Exponent (2003) show that the highest concentrations were generally found within the pier line and lower, more evenly distributed concentrations were found outside the pier line. Therefore, the station distribution scheme used at the Shipyard site is considered adequate to characterize the nature and extent of sediment contamination.

Because there are no firm rules or agency guidance on the number of stations that should be sampled at a contaminated sediment site (i.e., because each site is different), the number used to characterize a particular site is usually determined using the best professional judgment of the scientists, regulatory staff, and responsible parties involved with site. These decisions take into account the site-specific nature of sources and transport mechanisms, and the effort and costs involved in both the site investigation and potential cleanup actions. Because this was the process used to develop the station distribution scheme for the Shipyard Site, the station densities are considered adequate to characterize the nature and extent of sediment contamination, and to develop a remedial footprint.

•SDC and EHC state that “ranking the polygons from most- to least-contaminated using the Composite Surface Weighted Average Concentration (SWAC) Value fails to consider the potential adverse effects on human health or the environment,” and that “the method also ignores concentrations of other contaminants—such as lead, zinc, and low molecular weight PAHs.”

The first assertion is invalid because, as described in Section 33.1.2 of the DTR, the composite SWACs were based on all five primary COCs at each station. The composite values therefore provided quantitative estimates of the degree of chemical contamination at all Shipyard stations, which allowed the stations to be ranked with respect to the magnitude of risks that they posed to human health and the environment on the basis of chemical contamination. The second assertion made by SDC and EHC is invalid because, as described in Section 29.3 of the DTR, the secondary COCs at the Shipyard site generally exhibited strong positive correlations with one or more of the primary COCs, indicating that they would be addressed in a common remedial footprint. Therefore, the co-occurrence evaluation conducted in the DTR ensured that the secondary COCs were accounted for in the remedial footprint.

•SDC and EHC state that “the Proposed Remedial Footprint arbitrarily excludes 15 polygons that are more contaminated—from a sediment chemistry standpoint—than the least-contaminated polygon in the Proposed Remedial Footprint.”

Although SDC and EHC (2011) did not identify the 15 polygons referred to in the statement, they refer to MacDonald (2011), in which the 15 polygons were those with Composite SWAC Ranking Values greater than 5.5. SDC and EHC’s assertion is invalid, however, because the DTR clearly states on Page 33-1 that, “The polygons were ranked based on a number of factors including likely impaired stations, composite surface-area weighted average concentrations for the five primary COCs, site-specific median effects quotient (SS-MEQ) for non-Triad stations, and highest concentration of individual primary COCs”. Therefore, the selection of the polygons to include in the remedial footprint was based on multiple lines of evidence, as opposed to a single line of evidence such as the Composite SWAC Ranking Values. As shown in Table 33-1 of the DTR, the 23 polygons with the highest Composite SWAC Ranking Values were included in the remedial footprint (see third column of the table), and all of those polygons had values of 7.6 or greater. Polygon NA09 was added to this group primarily because it had the 10th highest concentration of mercury (i.e., a primary COC) of all the polygons (see Table 33-4 of the DTR). Therefore, the SWAC Value of 5.5 was not the primary line of evidence used to include Polygon NA09 in the remedial footprint, and a SWAC Value of 5.5 was not used as a standalone

justification for including any polygon in the remedial footprint, as MacDonald (2011) implied. SDC and EHC's assertion is therefore invalid.

- SDC and EHC state that “the DTR fails to explain why the Site Specific Median Effects Quotient (SS-MEQ) is used to evaluate sediment chemistry in the non-Triad sediment samples, when the metric used for the Triad sediment samples (SQG1) is reliable.”

The SS-MEQ was specifically developed to be an environmentally protective site-specific predictor of both non-likely and likely impairment at the Shipyard Site. The switch from the SQG1 to the SS-MEQ was therefore justified because the SQG1 values are generic guidelines that do not explicitly consider the site-specific conditions at the Shipyard Site. By contrast, the SS-MEQ was based exclusively on chemical and biological data collected at the site and therefore is a more appropriate site-specific sediment assessment tool than the SQG1.

- SDC and EHC state that “the DTR and record provide no evidence demonstrating how or why 0.9 was chosen as the “optimal threshold.”

The methods used to develop and evaluate the SS-MEQ are clearly described in the text of Section 32.5.2 of the DTR, and all of the related underlying data are presented in Table A32-11 of the DTR. As noted in the DTR, a threshold value of 0.9 had an overall reliability of 70 percent. In addition, the other measures of predictive reliability of the SS-MEQ threshold of 0.9 presented in Tables 32-21 and A32-11 of the DTR show that the threshold is biased toward being environmentally protective. That is, its ability to accurately predict locations that are not likely impaired (referred to as non-likely efficiency in Table A32-11 of the DTR) was 94 percent (i.e., 16 of 17 predictions). The only polygon erroneously predicted to not be likely impaired was NA22, which had a SS-MEQ of only 0.35. As stated in Section 32.5.2 of the DTR, however, there is substantial evidence of non-COC related impairment from physical disturbance in that polygon. The ability of the threshold SS-MEQ of 0.9 to accurately predict likely impairment (referred to as likely efficiency in Table A32-11 of the DTR) was only 38 percent (i.e., 5 of 13 predictions). That is, the SS-MEQ threshold of 0.9 predicted impairment at a substantial number of locations without impairment, as well as stations with impairment. These results indicate that there is a very high degree of confidence that polygons with SS-MEQ values less than 0.9 are not likely to be impaired. Therefore, the decision to include all polygons with SS-MEQ less than 0.9 in the remedial footprint is environmentally protective. In contrast, there is much less confidence that polygons with SS-MEQ values greater than 0.9 are likely to be impaired. Therefore, the conservative decision to include all polygons with SS-MEQ values greater than 0.9 in the remedial footprint is also environmentally protective, because over half of those polygons may not be impaired. Contrary to the SDC and EHC (2011) assertion, the information presented above indicates that the threshold SS-MEQ of 0.9 is an environmentally protective predictor of both the presence and absence of impairment at the Shipyard Site.

- SDC and EHC state that “the 60% Lowest Apparent Effects Threshold for classifying sediment samples as “Likely” impacted is too high.”

The apparent basis for this assertion is the evaluation conducted by MacDonald (2011), in which he showed that the 60% LAET values were greater than the ERM values of Long et al.

(1995). That comparison is flawed, however, because the LAET values were derived as site-specific values that reflect the mixtures of chemicals at the Shipyard Site, in addition to other important factors such as the site-specific bioavailability and bioaccessibility of those chemicals. By contrast, the ERM values were derived from sediment chemistry and toxicity data collected throughout the U.S., without any consideration of bioavailability or bioaccessibility. They are therefore only suitable as initial screening values for a site, rather than values that can reliably predict the presence or absence of sediment toxicity on a site-specific basis. In fact, Long et al. (1995) recognized the limited usefulness of the ERM values when they concluded that the values “should be used as informal screening tools in environmental assessments,” and “they are not intended to preclude the use of toxicity tests or other measures of biological effects.” Because the ERM values are generic screening values that do not consider bioavailability, it is not surprising that the 60%LAET values are greater than the ERM values, as the former values reflect the site-specific conditions that occur at the Shipyard Site. Therefore, SDC and EHC’s assertion has no bearing on the usefulness of the site-specific 60% LAETs for identifying stations that are likely impaired at the site.

•SDC and EHC state that “the DTR failed to explicitly consider the potential effects exposure to contaminated sediments would have on fish with small home ranges.”

This assertion is inaccurate. The species selected for detailed evaluation at the Shipyard Site was the spotted sand bass (*Paralabrax maculatofasciatus*) because, as stated in Exponent (2003), this species preys primarily on benthic macroinvertebrates, exhibits limited spatial movements, and is abundant in numerous kinds of habitats within San Diego Bay, including the Shipyard Site, as documented during the fish sampling effort prior to the 2001/2001 sampling events. These characteristics of the spotted sand bass make it an appropriate species for assessing contaminant exposure at the Shipyard Site. This determination is reinforced by the results of tissue chemistry analyses. Spotted sand bass were collected at four locations, inside and outside the leaseholds of both shipyards, and the results showed that chemical concentrations in fish tissue from inside the leaseholds were greater than concentrations in fish collected immediately outside the leaseholds (Exponent 2003). The data therefore clearly indicate that spotted sand bass are sensitive to spatial differences in sediment chemistry concentrations at the Shipyard Site. Although gobies were identified as a possible alternative species for use at the Shipyard Site, they were not found at the site during an extensive sampling effort prior to the 2001/2002 sampling event. As stated on Page 2-7 of the Exponent (2003) report, “attempts were also made to collect gobies, without success at either site.” Representatives from the California Department of Fish and Game observed the fish collection effort and agreed that gobies were absent or rare at the Shipyard Site.

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2.Reply to Comment IV.B.2. The Proposed Remedial Footprint excludes eight polygons that, under the DTR’s own methodology, should have been included.

•SDC and EHC state that “Polygons NA22, NA01, NA04, NA07, NA16, SW06, SW18, and SW29 should have been included in the Proposed Remedial Footprint and should be added to the final remedial footprint.”

This statement is invalid for the reasons provided below.

a. Reply to Comment IV.B.2.a. The Proposed Remedial Footprint improperly excludes NA22.

•SDC and EHC state that “NA22 has improperly been excluded from the Proposed Remedial Footprint.”

Section 33 of the TCAO states that NA22 is being evaluated in the Mouth of Chollas Creek TMDL, and therefore is not considered part of the Shipyards Site for the purposes of the TCAO. Thus, NA22 was properly removed from the remedial footprint.

b. Reply to Comment IV.B.2.b. The Proposed Remedial Footprint excludes—NA01, NA04, NA07, NA16, SW06, SW18 and SW29—which pose unacceptable risks to fish and the benthic community.

•SDC and EHC state that “the DTR arbitrarily excluded at least a dozen polygons from the Proposed Remedial Footprint without explanation,” and that the seven polygons identified in the comment should be added to the remedial footprint.

Multiple site-specific indicators of sediment quality indicated that these polygons do not warrant inclusion in the remedial footprint, as follows:

•NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.

•NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.

•NA07: Not likely impaired based on Triad analysis.

•NA16: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.

•SW06: Not likely impaired based on the supplemental Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.63) was less than the threshold of 0.9.

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•SW18: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.62) was less than the threshold of 0.9.

•SW29: No primary COCs exceeded their 60%LAET values, the SS-MEQ (0.71) was less than the threshold of 0.9.

Based on the information presented above, SDC and EHC’s assertion that the seven polygons should be included in the remedial footprint is invalid with respect to risks to benthic macroinvertebrate communities.

With respect to fish, the concerns are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on the results of extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). MacDonald (2009) conducted a hypothetical risk analysis based on gobies, which were not found at the Shipyard Site during the extensive fish collection efforts that were conducted prior to the 2001/2002 sampling events at the site (Exponent 2003). That analysis was flawed for numerous reasons, however, and has no relevance for determining which polygons warrant inclusion in the remedial footprint. Some of the major methodological flaws in the hypothetical analysis conducted by MacDonald (2009) are as follows:

- Indicators Species: As discussed above, the selection of gobies as the indicator species was inappropriate because they are not found at the Shipyard Site.
- Toxicity Reference Value (TRV): MacDonald (2009) used a study by Orn et al. (1998) to develop the TRV for PCBs in fish. However, that study was based on zebrafish (*Danio rerio*) which, as a tropical freshwater species, are not found in San Diego Bay, and thus has questionable relevance to the marine fish species that reside in the Bay.
- Toxicity Endpoint: MacDonald (2009) selected reproduction as the endpoint for developing the TRV for PCBs, and developed the TRV based on ovary weight and the gonad somatic index (GSI). However, he ignored the fact that other reproductive endpoints (i.e., percentage of spawning females, mean number of eggs per female, and median hatching time), as well as early mortality showed no significant reductions in response to exposure to PCBs.
- Biota Sediment Accumulation Factor (BSAF): MacDonald (2009) used a BSAF determined for spotted sand bass in an unpublished memo by Zeeman (2004).
- Lipid Content: MacDonald (2009) assumed the lipid content of the gobies was 4 percent, based on the naked goby (*Gobiosoma bosc*) and presented in an unpublished presentation by Lederhouse et al. (2007).
- Moisture Content: MacDonald (2009) assumed a whole-body moisture content of 80 percent for fish to convert the wet weight PCB concentrations presented in Orn et al. (1998) to dry weight.

In summary, MacDonald (2009) conducted a hypothetical analysis that predicted PCB concentrations in gobies, a species that does not occur at the Shipyard Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, an unpublished lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above items has uncertainties attached to it, which MacDonald (2009) did not attempt to quantify or even acknowledge. Given each of the uncertainties in MacDonald's hypothetical analysis, as well as the cumulative nature of them all, it is clear that the results of the hypothetical analysis conducted by MacDonald (2009) cannot be used to assess risk to fish at the Shipyard Site in a meaningful manner. In addition, such a hypothetical analysis is irrelevant because the extensive amount of site-specific information on the barred sand bass showed that risks to fish were not an issue at the Shipyard Site under baseline conditions.

**Comment ID:** 431

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SECTION IV. THE PROPOSED CLEANUP FAILS TO REQUIRE THE BEST  
WATER QUALITY REASONABLE.

This comment is invalid for the reasons provided below.

C.Reply to Comment IV.C. The Remediation Monitoring is Insufficient to Assess Remedial Activities' Impacts on Water Quality, to Evaluate the Effectiveness of Remedial Measures, or to Identify the Need for Further Dredging to Achieve Clean-up Goals at the Shipyard Sediment Site.

This comment is invalid for the reasons provided below.

1.Reply to Comment IV.C.1. The water quality component of the Remediation Monitoring program fails to provide safeguards to ensure data collected reveals actual water quality conditions.

•SDC and EHC state that “the water quality component of the Remediation Monitoring Program falls short in two ways: (1) some of the requirements are specific but are not designed to collect data to accurately reflect water quality impacts during remediation and (2) some requirements are vague, allowing Dischargers to collect data in a way that masks the true water quality impacts during dredging.”

As described in the TCAO, the detailed specifications of the water quality monitoring program will be specified in the Remediation Monitoring Plan, as part of the Remedial Action Plan, which will be prepared within 90 days from adoption of the CAO. The specifications presented in the Remediation Monitoring Plan will then be reviewed for technical adequacy. As stated in the TCAO, “the water quality monitoring must be sufficient to demonstrate that implementation of the selected remedial activities do not result in violations of water quality standards outside the construction area.” The final specifications of the water quality monitoring program will therefore be designed to meet that stated objective.

2.Reply to Comment IV.C.2. The sediment component of the Remediation Monitoring program fails to require data collection to confirm Cleanup Levels are achieved.

•SDC and EHC state that “the sediment portion of the Remediation Monitoring program fails to require Dischargers to collect data in an amount and through methods sufficient to competently measure compliance with the alternative clean-up levels.”

As described for the water quality monitoring program above, the detailed specifications of the sediment monitoring program will be specified in the Remediation Monitoring Plan, and will then be reviewed for technical adequacy. As stated in the TCAO, “the sediment monitoring must be sufficient to confirm that the selected remedial activities have achieved target cleanup levels within the remedial footprint.” The final specifications of the sediment monitoring program will therefore be designed to meet that stated objective.

**Comment ID:** 432

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS



REPLY TO SECTION IV. THE PROPOSED CLEANUP FAILS TO REQUIRE THE BEST WATER QUALITY REASONABLE.

This comment is invalid for the reasons provided below.

D. Reply to Comment IV.D. The Post Remedial Monitoring Program is Poorly Designed and Will not Require Data Collection to Accurately Evaluate Post-Remediation Conditions.

SDC and EHC make numerous statements in this comment. Responses to each of those statements are presented below.

- SDC and EHC state that “NA22 must be included in any Remedial Monitoring because it is a part of the Shipyard Sediment Site.”

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This statement is erroneous because, as discussed previously, Section 33 of the TCAO states that NA22 is being evaluated in the Mouth of Chollas Creek TMDL, and therefore is not considered part of the Shipyards Site for the purposes of the TCAO.

- SDC and EHC also state that “the approach to evaluating post-remedial conditions is likely to underestimate sediment toxicity because the DTR relied on inappropriate thresholds.”

The specifications described in Section D of the TCAO on how the monitoring results for sediment chemistry, sediment toxicity, and bioaccumulation will be evaluated are objective, quantitative, and environmentally protective. They will therefore ensure that beneficial uses in San Diego Bay will be protected in the future.

- SDC and EHC state that “requiring sediment samples to be collected at only five sampling stations to evaluate benthic community conditions is inadequate,” and that “the Post Remedial Monitoring plan should be expanded to provide a more robust basis for evaluating exposure of benthic invertebrates to contaminants at the site and for assessing sediment toxicity.”

The five stations selected for evaluations of benthic exposure were the only five stations in the remedial footprint found to have likely impairment based on the Triad analyses described in the DTR (see Section 18 of the DTR). Therefore they represent the highest priority areas for remediation and are appropriately identified for monitoring of sediment chemistry and toxicity to evaluate benthic exposure. It should also be recognized that subsamples of sediment from all 65 polygons will be archived as part of the sediment compositing analysis, and will therefore be available for future chemical analysis if necessary.

- SDC and EHC state that “the Post Remedial Monitoring program’s bioaccumulation requirements are insufficient,” and that “because the bioaccumulation criteria are not effects-based, they will not be useful for determining if conditions at the Shipyard Sediment Site will be unreasonably affecting San Diego Bay beneficial uses.”

Attachments 3 and 4 to the TCAO show that the nine stations selected for bioaccumulation analysis are distributed along the entire length of the remedial footprint, and thereby will provide a relatively complete assessment of potential bioaccumulation throughout the site. In addition, the bioaccumulation criteria specified in Section D of the TCAO were designed to document that bioaccumulation levels are responding to the sediment remediation and are showing a decreasing trend in Year 2, relative to post-remediation levels, and decreasing or continuous trends in Years 5 and 10. The bioaccumulation evaluations were therefore designed appropriately for their intended use.

•SDC and EHC state that “the Order fails to include rules specifying what actions the Dischargers must take in several situations, including (1) if sediment chemistry results for the post-remediation sediment samples exceed the thresholds included in the Order and (2) if toxicity to one or more species is observed during the Post Remedial sampling and testing.”

In Section D of the TCAO, the decision rule for sediment chemistry is identified as “sediment chemistry below SS-MEQ and the 60% LAET thresholds.” If these criteria are not achieved, the Regional Board will then evaluate whether further actions at the site are warranted. In addition, in Section D of the TCAO, the rule for sediment toxicity is identified as “toxicity not significantly different from conditions at the reference stations described in Finding 17.” If this criterion is not achieved, the Regional Board will then evaluate whether further actions at the site are warranted.

•SDC and EHC state that “the Order does not list the triggers that will be used for evaluating sediment chemistry for benthic exposure.”

In Section D of the TCAO, the decision rule for sediment chemistry is identified as “sediment chemistry below SS-MEQ and the 60% LAET thresholds.” If these criteria are not achieved, the Regional Board will then evaluate whether further actions at the site are warranted.

**Comment ID:** 433

**Organization:** BAE Systems

**DTR Section:** 33

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.’S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION’S COMMENTS

REPLY TO SECTION IV. THE PROPOSED CLEANUP FAILS TO REQUIRE THE BEST  
WATER QUALITY REASONABLE.

This comment is invalid for the reasons provided below.

E.Reply to Comment IV.E. The DTR Contains Incorrect Statements.

•SDC and EHC state that “the DTR incorrectly claims that the Proposed Remedial Footprint ‘captures 100 percent of triad “Likely” . . . impacted stations,’” and that “this claim is incorrect because the Proposed Remedial Footprint excludes NA22.”

As discussed previously, Section 33 of the TCAO states that NA22 is being evaluated in the Mouth of Chollas Creek TMDL, and therefore is not considered part of the Shipyards Site for the purposes of the TCAO.

**Comment ID:** 434

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

#### VI.REPLY TO SDC AND EHC'S CONCLUSIONS

SDC and EHC draw numerous conclusions in this section that are invalid. Each of those conclusions statements are addressed in turn.

A. Reply to SDC and EHC's Conclusion 1. The Order and DTR Must Require that the Remediation Achieve the Alternative Clean-up Levels.

•SDC and EHC state that "the '120% of background' second-dredging pass trigger and the 'Trigger Concentrations' work together to allow the pollutant levels at the Site to exceed Alternative Cleanup Levels at the Site following remediation."

As discussed previously, the DTR clearly and appropriately states that the rationale for the 120% background rule is to address the natural variability encountered when making measurements of sediment chemistry in environmental samples. SDC and EHC's analysis presented in Table 2 of the comments is flawed because it is based on the highly improbable scenario that concentrations of all five primary COCs would be found at 120% of their background levels throughout the entire remedial footprint. A much more likely scenario is that only a subset of the COCs would be found at 120% of their background levels, and that this would occur only in apportion of the footprint rather than throughout the entire areas. Even if the highly unlikely scenario presented in Table 2 of SDC and EH's comments is found, the magnitude of the exceedance of the Alternative Screening Cleanup Level for each COC is very small, ranging from 0.6 to 1.5 %. Therefore, SDC and EHC's proposed conclusion is incorrect.

Furthermore, SDC and EHC's conclusion is also invalid with respect to the Trigger Concentrations because they were appropriately designed to address the degree of natural variability expected to be found associated with measurements of the Alternative Cleanup Levels at the Shipyard Site, based on the area-weighted variability of the measured COC concentrations in the non-remediated areas.

**Comment ID:** 435

**Organization:** BAE Systems

**DTR Section:** 31

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SDC AND EHC'S CONCLUSIONS

SDC and EHC draw numerous conclusions in this section that are invalid. Each of those conclusions statements are addressed in turn.

B.Reply to SDC and EHC's Conclusion 2. The Regional Board Should Make an Independent Finding of What Level of Cleanup is Economically Feasible Based on all the Evidence in the Record Regarding Economic Feasibility.

The purpose of the economic feasibility analysis, as stated by the Regional Board's Cleanup Team (Carrigan 2011) is solely to determine whether cleanup to background is economically feasible. The Cleanup Team has determined that cleanup to background is not economically feasible, and that the proposed footprint is economically feasible, based on the cost-effectiveness of different cleanup scenarios. The stated purpose of the economic feasibility analysis does not include or imply any requirement to evaluate the economic feasibility of all, or any, other cleanup scenarios that may be favored by SDC/EHC.

**Comment ID:** 436

**Organization:** BAE Systems

**DTR Section:** 32.1.1 at 32-40

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SDC AND EHC'S CONCLUSIONS

SDC and EHC draw numerous conclusions in this section that are invalid. Each of those conclusions statements are addressed in turn.

C.Reply to SDC and EHC's Conclusion 3. The Proposed Remedial Footprint Should Be Enlarged by Eight Polygons.

•SDC and EHC state that "Polygon NA22 should be added to the Remedial Footprint to address the real risks pollution in this polygon poses to current beneficial uses," and that "NA01, NA04, NA07, NA16, SW06, SW18 and SW29 pose unacceptable risks to fish and the benthic community and should be added to the remedial footprint to address these risks."

As discussed previously, Section 33 of the TCAO states that NA22 is being evaluated in the Mouth of Chollas Creek TMDL, and therefore is not considered part of the Shipyard Site for the purposes of the TCAO. The other seven polygons should not be included in the remedial footprint, as discussed previously, multiple site-specific indicators of sediment quality indicated that those polygons do not warrant inclusion in the remedial footprint. The site-specific indicators are as follows:

- NA01: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.
- NA04: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.
- NA07: Not likely impaired based on Triad analysis.
- NA16: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.69) was less than the threshold of 0.9.
- SW06: Not likely impaired based on the supplemental Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.63) was less than the threshold of 0.9.
- SW18: Not likely impaired based on Triad analysis, no primary COCs exceeded their 60%LAET values, the SS-MEQ (0.62) was less than the threshold of 0.9.
- SW29: No primary COCs exceeded their 60%LAET values, the SS-MEQ (0.71) was less than the threshold of 0.9.

Based on the information presented above, SDC and EHC's assertion that the seven polygons should be included in the remedial footprint is invalid with respect to risks to benthic macroinvertebrate communities.

With respect to fish, the concerns are unwarranted because risks to fish were not found to be an issue at the Shipyard Site under baseline conditions, based on the results of extensive site-specific evaluations using the abundant and benthic-feeding spotted sand bass as the key indicator species (Exponent 2003). As discussed previously, MacDonald (2009) conducted a hypothetical risk analysis based on gobies, which was flawed for numerous reasons and therefore has no bearing on determining which polygons warrant inclusion in the remedial footprint at the Shipyard Site. Briefly, MacDonald (2009) conducted a hypothetical analysis that predicted PCB concentrations in gobies, a species that does not occur at the Shipyard Site, using a TRV developed from a freshwater zebrafish, an unpublished BSAF based on sand bass, an unpublished lipid content based on the naked goby, and an assumed 80 percent moisture content in whole bodies of fish. Each one of the above items has uncertainties attached to it, which MacDonald (2009) did not attempt to quantify or even acknowledge. Given each of the uncertainties in MacDonald's hypothetical analysis, as well as the cumulative nature of them all, it is clear that the results of the hypothetical analysis conducted by MacDonald (2009) cannot be used to assess risk to fish at the Shipyard Site in a meaningful manner. In addition, such a hypothetical analysis is irrelevant because the extensive amount of site-specific information on the barred sand bass showed that risks to fish were not an issue at the Shipyard Site under baseline conditions.

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#### 1. Cost of Remediating Eight Additional Polygons.

SDC and EHC also claim that remediating eight additional polygons will require dredging an additional 120,000 cubic yards of sediment. They "estimate" total additional dredging costs would be approximately \$1.5 million, or only 2% (2.58%) of the current cleanup cost. SDC and EHC's estimate included only the cost for the dredge to remove the sediment from the bay bottom. It is unclear what SDC and EHC intended regarding all of the other costs associated with the remedial action, but there are additional substantial costs associated with any dredging, especially in a remedial action.

The June 22, 2011 declaration of Shaun Halvax, attaching a spreadsheet of cost assumptions, estimates that the cost for remediating the additional polygons is many times SDC and EHC's estimate. Mr. Halvax's declaration states he is in charge of BAE Systems' dredge activities in San Diego and other west coast locations and just completed dredging in BAE Systems' shipyard in January 2011. Mr. Halvax states that total dredging, disposal, and underpier remediation (inclusive of environmental protection measures and monitoring) will cost an estimated \$23,900,000. Costs associated with remedial dredging not considered by SDC and EHC include debris management, additional dredging/cleanup pass, protection of structures, return water management, disposal, clean sand cover, and sediment sampling/water quality monitoring. Details of these additional, but necessary, costs, including unit costs and assumptions may be found in the Halvax spreadsheet.

Instead of an incremental cost of approximately \$1,500,000, the more accurate cost associated with the additional 120,000 cubic yards of sediment is \$23,900,000. Even then, this estimate does not include any provision for uncertainty, permitting, long-term monitoring, design, construction management, and other potential costs that may incrementally increase the total cost of the remedial effort. Rather than an incremental increase of 2.58% to the cost of the proposed remedial action, the addition of SDC and EHC's suggested polygons will increase the estimated cost by 41% over the current estimate of \$58,100,000. (DTR § 32.1.1 at 32-40.) If additional polygons are dredged, as SDC and EHC urge, the likely cost of remediating the site will increase to at least \$82,000,000.

**Comment ID:** 437

**Organization:** BAE Systems

**DTR Section:** 34

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

REPLY TO SDC AND EHC'S CONCLUSIONS

SDC and EHC draw numerous conclusions in this section that are invalid. Each of those conclusions statements are addressed in turn.

E.Reply to SDC and EHC's Conclusion 5. Additional Trigger Concentrations and Triggers for Benthic Invertebrates Should Be Added to Ensure the Best Water Quality Reasonable

•SDC and EHC state that "additional 'trigger concentrations' for the secondary Contaminants of Concern should be added to the Post-Remedial Monitoring requirements," and that "triggers addressing benthic invertebrates should be added to the Post- Remedial Monitoring requirements."

As discussed previously, the secondary COCs are already accounted for in the remedial footprint due to their positive correlations with one or more of the primary COCs. In addition, the methods of analyzing the post-monitoring sediment chemistry, sediment toxicity, and bioaccumulation results are clearly identified in the TCAO and are considered both appropriate and sufficient.

**Comment ID:** 438

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR, INC.'S REPLY TO SAN DIEGO  
COASTKEEPER AND ENVIRONMENTAL HEALTH COALITION'S COMMENTS

## VII.CONCLUSION

As set forth above, the Regional Board applied the correct legal standard, based its finding that cleanup to background is not economically feasible on a well-reasoned analysis of cost effectiveness, and set appropriate cleanup levels that do not unreasonably impair the beneficial uses of the water. Accordingly, SDC and EHC's comments lack credence and should be rejected.

**Comment ID:** 439

**Organization:** BAE Systems

**DTR Section:** 11.1

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

## I.INTRODUCTION AND FACTUAL BACKGROUND

### A.Port District as Lessor

From the early 1900s until 1962, the City owned and leased what is now the BAE Systems Leasehold to a host of industrial tenants. The Port District, which was created by statute in 1962, now holds and manages the BAE Systems Leasehold as trust property on behalf of the People of the State of California. The Port District likewise leased the BAE Systems Leasehold to industrial tenants unrelated to BAE Systems from 1962 to 1979 (1985 for the South end of the yard).

The lease agreement between BAE Systems and the Port District requires that BAE Systems use the leasehold exclusively for shipbuilding and repair and related marine activities, authorizes the Port District to suspend operations under certain circumstances, prohibits BAE Systems from assigning or subleasing the site without the Port District's permission, permits the Port District to inspect the leasehold, permits the Port District to approve or deny termination of the lease by BAE Systems, and permits the Port District to terminate the lease for violations of the lease's terms and conditions. (See SAR 057580-057608 [1979 Southwest Marine Lease]; SAR 057609-057640 [Southwest Marine Agreement for Amendment of Lease No. 1].) The lease further acknowledges that BAE Systems' tenancy provides to the community water front employment, tax revenue, as well as lease income. (Id.)

A number of industrial tenants unrelated to BAE Systems previously leased the premises under lease terms similar to the Port District's lease with BAE Systems. Certain of those entities are defunct, recalcitrant and/or not participating in these proceedings.

In addition to its management of the land currently identified as the BAE Systems Leasehold, the Port District also manages land currently occupied by NASSCO, as well as the cooling water tunnels for SDG&E's former Silver Gate Power Plant. (TCAO Finding 11; DTR § 11.1.)

**Comment ID:** 440

**Organization:** BAE Systems

**DTR Section:** 11.1, 11.3, 11.4

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

## INTRODUCTION AND FACTUAL BACKGROUND

### B.Port District's Primary Liability as Owner and Operator

Because the Port District (1) was responsible for the use and maintenance of the land currently leased by NASSCO, BAE Systems, and SDG&E and the land formerly leased by San Diego Marine Construction Co., Star & Crescent and Campbell; (2) had knowledge of the potential for discharges from the leased properties to materially contribute to accumulations of pollutants in the San Diego Bay; and (3) had the requisite degree of control over its tenants' activities, the DTR correctly concludes that the "the Port District caused or permitted waste to be discharged into San Diego Bay, creating a condition of pollution and/or nuisance in the Bay at the Shipyard Sediment Site . . ." (TCAO Finding 11; DTR § 11.1.) As such, the DTR names the Port District as a "discharger, . . . consistent with its responsibility for the actions, omissions and operations of its tenants." (Id.)

As a separate and independent basis for primary liability, the Port District also owns and operates a municipal storm sewer system (MS4). (TCAO Finding 11; DTR § 11.3.) The Port District is a co-permittee of current and prior NPDES Storm Water Permits that regulate the MS4 drains which outfall on the BAE Systems Leasehold (SW4) and the NASSCO Leasehold (SW9). (Id.) The DTR concludes that the Port District, through its MS4 conveyances, has discharged urban storm water containing waste directly to San Diego Bay at the Shipyard Sediment Site. (TCAO Finding 11; DTR § 11.4.) The Port District admits the same. (Port District comments, at 17.)

**Comment ID:** 441

**Organization:** BAE Systems

**DTR Section:** 11

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

## II.LEGAL STANDARD FOR NAMING DISCHARGERS

In 1969, the California legislature enacted the Porter-Cologne Water Quality Control Act, Cal. Water Code §§ 13000-14958 (hereinafter, the "Act"), with the declared objective of ensuring "that the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state." Cal. Water Code § 13000. With this objective in mind, the Act grants the Regional Board broad latitude to issue Cleanup and Abatement Orders ("CAOs") when necessary to protect California's valuable and limited water resources from contamination.



Cal. Water Code § 13304(a). Specifically, the Act provides that the Regional Board may order cleanup and abatement by the following: (1) “any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board;” or (2) any person “who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance.” *Id.*

The regulations governing the investigation and issuance of CAOs further require that the Regional Board name other dischargers to the maximum extent permitted by law. See 23 Cal. Code Regs. § 2907; See also State Water Board Resolution No. 92-49, “Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304,” at § II(A)(4).

The Regional Board is granted this broad authority precisely because of situations, such as the one here, where contamination is discovered many years after the events causing the contamination. As stated by a leading treatise on California environmental law: “Due to the passage of time and the difficulty of interpreting hydrogeologic evidence, it often is impossible to establish who is responsible for the contamination with a great degree of certainty.” Kenneth A. Manaster and Daniel P. Selmi, *California Environmental Law and Land Use Practice*, § 32.32(1)(a), at p. 32-42.

**Comment ID:** 442

**Organization:** BAE Systems

**DTR Section:** 11.2.

**Comment:**

BAE Systems San Diego Ship Repair, Inc.’s reply to the san diego unified port district’s comments

III. THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR PRIMARY RESPONSIBILITY

The DTR properly concludes that the Port District “should not bear merely secondary responsible at this time.” The DTR finds that the Port District should be held responsible “to the extent the Port’s tenants, past and present, have insufficient financial resources to cleanup the Shipyard Sediment Site and/or fail to comply with the order.” (TCAO Finding 11; DTR § 11.2.)

The Port District does not appear to dispute that it should be named as a discharger due to its capacity as a landlord of tenants identified in the TCAO as dischargers. (Port District Comments at 7.) Nevertheless, the Port District contends that it is entitled to status as a secondarily responsible party because “[t]he Port’s tenants have more than sufficient assets to conduct the cleanup.” (*Id.* at 8.) There are a number of issues with the Port District’s position that render it incorrect.

**Comment ID:** 443

**Organization:** BAE Systems

**DTR Section:** 11

**Comment:**

BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR  
PRIMARY RESPONSIBILITY

A. The Port District Bears the Burden of Demonstrating That its Current and Former Tenants  
Have Sufficient Assets to Conduct the Cleanup

As an initial matter, the Port District's comments reflect a fundamental misunderstanding of the allocation of burdens in a secondary liability inquiry. The Port District asserts that the prior iterations of the TCAO did not name the Port District as a primary discharger "because of its determination that the Port's tenants had adequate assets to conduct the cleanup and were cooperating." (Port District Comments at 8.) To the contrary, the prior iterations of the TCAO noted only that there was "no evidence at this time indicating that [the Port's tenants] have insufficient financial resources to cleanup the Shipyard Sediment Site." (SAR 375780, at 372818-375819.) These prior iterations improperly placed the burden of demonstrating the Port District's entitlement to secondary liability status on the Port District's tenants. The Presiding Officer, however, has correctly ruled that as the party seeking status as a secondarily responsible party, it is the Port District's burden to demonstrate that its current and former tenants have sufficient assets to cover the cleanup. (October 27, 2010 Order Reopening Disc. Period, at § III.)

**Comment ID:** 444

**Organization:** BAE Systems

**DTR Section:** 11

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR  
PRIMARY RESPONSIBILITY

B. The Port District has Failed to Meet its Burden

The DTR's conclusion that the Port District should be named primarily responsible is correct because the Port District has failed to meet its burden of establishing that equitable reasons justify imposing secondary liability. Secondary liability is appropriate, if at all, in cases where there are equitable reasons that justify imposing different liability on the relevant parties. See, e.g., In the Matter of the Petitions of Arthur Spitzer et al., Order No. 89-8, at p. 25 (holding that it would be inappropriate to name a successor entity as "secondarily" liable when its predecessor entity released contaminants which polluted the waters of the State).

1. BAE Systems has No Liability for Any Pre-1979 Discharges Including "Orphan Shares"

BAE Systems does not dispute, and in fact has stipulated, that it has the financial assets to cover amounts of the cleanup and remedial monitoring under the TCAO which are based on BAE Systems' post 1979 tenancy at the Leasehold and which are ultimately allocated to BAE

Systems. The Port District erroneously asserts that it believes BAE Systems should also have to fund cleanup and remedial monitoring costs that are attributable to former tenants of the BAE Systems Leasehold who are unable or unwilling to pay for their own share of the cleanup effort. That position is factually and legally incorrect.

Here, BAE Systems is not the successor entity to any of the entities that operated on the BAE Systems Leasehold prior to 1979. BAE Systems had no connection to the BAE Systems Leasehold prior to 1979 when it entered into its lease with the Port District. Accordingly, BAE Systems is not a “discharger” under section 13304 of the Act for any pre-1979 discharges. The Port District, on the other hand, remains primarily liable for any pre-1979 discharges to the extent its tenants for any applicable time period are unable or unwilling to fund the cleanup of discharges attributable to such time period.

Where the operator responsible for the discharge is no longer in existence or not cleaning up the site, thus creating a so called “orphan share,” the landowner is considered the “discharger” and is primarily liable for remediating the site. In the Matter of the Petitions of Aluminum Company of America et al., Order No. 93-9, at pp. 16-18. “The Board has cited several factors which are appropriate for the Regional Water Boards to consider in determining whether a party should be held secondarily liable. These include: (1) whether or not the party initiated or contributed to the discharge; and (2) whether those parties who created or contributed to the discharge are proceeding with cleanup.” *Id.* at p. 16 (citations omitted). As the DTR properly concludes, both factors cut against finding the Port District merely secondarily liable. As discussed above, the lease provisions gave the Port District significant control over the activities of the former tenants of the BAE Systems Leasehold. By permitting these entities to discharge, unabated, for a number of years, the Port District contributed to the discharge. As to the second factor, the ability of all of the parties to pay for their respective shares of the cleanup is far from clear at this time. Even the Port District concedes as much, noting that “the Star & Crescent entity that is currently named in the TCAO and DTR disputes its successor liability for the other predecessor entities that operated at the Shipyard Sediment Site.” (Port District’s comments at 11.) Indeed, the successor liability analysis utilized in the DTR to find Star & Crescent to be the successor to San Diego Marine Construction Company’s liability is debatable, and is the subject of a pending motion for summary judgment by Star & Crescent in the federal action. Thus, to the extent these entities are not and cannot comply with the CAO, which certainly appears likely at least with respect to San Diego Marine Construction Company (1962-1972), and potentially Campbell (1972-1979), the Port District is responsible. Accordingly, it is appropriate for the Port District to be considered primarily liable for compliance with the TCAO unless and until those parties fully comply with the final order.

Although it appears to concede liability for any “orphan shares,” the Port District attempts to escape liability by claiming that its tenants, including BAE Systems, “have lease and permit terms obligating the tenants to defend and indemnify the Port against this type of liability.” (Port District’s comments at 9.) With respect to BAE Systems, this is patently false. The Hold Harmless provision in the Southwest Marine lease upon which the Port District relies, was superseded and replaced entirely with a different Hold Harmless provision that precludes the Port District’s argument. The Second Amendment to the lease expressly amends the First Amendment by “deleting therefrom Paragraphs...21...in [its] entirety and substituting in lieu thereof Paragraphs...21...as follows.” (See Second Amendment to Southwest Marine Lease, at ¶ 21.) It then states:

21. HOLD HARMLESS: Lessor, and its agent, officers, and employees shall, to the full extent allowed by law, be held by Lessee free and harmless from and indemnified against any liability pertaining to or arising out of the use and operation of the premises by Lessee and any costs of expenses incurred on account of any claim or claims therefore, including reasonable attorney's fees. Nothing herein is intended to exculpate Lessor from its sole active negligence or willful misconduct.

(Id. (emphasis added).) This Hold Harmless provision requires only that BAE Systems indemnify and hold harmless the Port District for liability arising out of BAE Systems' use and operation of the premises, not prior lessees' use and operation of premises. A written modification of the terms of a contract "supersedes those terms to which it relates." Thiele v. Merrill Lynch, Pierce, Fenner & Smith, 59 F. Supp. 2d 1060, 1064 (S.D. Cal. 1999). Because the Hold Harmless Provision in the Second Amendment completely superseded all prior Hold Harmless Provisions, BAE Systems has no obligation to defend and indemnify the Port District for any liability arising out of any "orphan shares."

## 2. Mere Reference to Historical Insurance Policy Limits Fails to Demonstrate Applicability or Availability of Any Assets

The Port District asserts, without support, that it "believes BAE has tens of millions of dollars of historic liability coverage that would be potentially applicable to the remediation and monitoring efforts." (Port District's comments at 9 (emphasis added).) As support for its "belief," the Port District relies exclusively on a summary of "BAE Historic Liability Insurance" that it includes in its comments to the Regional Board. The same reliance is made with respect to historical insurance summaries for other parties, also prepared by the Port District.

However, the Port District merely cites to what it says are policy limits for historical policies. The Port District makes no showing whatsoever (1) whether the policy provides actual coverage for the claims and anticipated obligations at issue here, (2) whether the insurer is defunct or insolvent, (3) whether any policy amounts have been sold back or are otherwise unavailable, and (4) most importantly, whether any insurer for any party has actually accepted coverage for indemnity obligations. This lack of evidence is unsurprising, as courts have consistently held that the obligation to indemnify does not arise until the insured's underlying liability is established. See, e.g., *Montrose Chemical Corp. v. Admiral Ins. Co.*, 10 Cal. 4th 645, 659 n.9 (1995). Without any such evidence or showing, the Port District's "belief" as to BAE Systems' and other dischargers' "potential" insurance assets is unsupported, insufficient, and certainly is not evidence upon which the Regional Board can or should change the Port District's status to that of a secondarily responsible party.

The Regional Board has a broad duty to name all dischargers in CAOs to the maximum extent permitted by the Water Code. Because the Port District has failed to demonstrate that its tenants, including BAE Systems, are obligated to conduct the cleanup attributable to any orphan shares or have sufficient assets to do so, the DTR's conclusion that the Port be named a primarily responsible party is correct.

**Comment ID:** 445  
**DTR Section:** 11.2.

**Organization:** BAE Systems

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT SHOULD BEAR  
PRIMARY RESPONSIBILITY

C.Any Change in the Port District's Liability Status Would be Premature

It is premature for the Regional Board to determine whether the Port District's current and historical tenants have sufficient financial resources to remediate the Site because the remediation costs have not yet been finally or specifically determined. Until the remediation is underway, it is inappropriate for the Regional Board to alter the primarily versus secondarily liability of designated parties. See *In re Wenwest, Inc.*, State Water Resources Control Board Order No. WQ 92-13, at 3 n.2. Moreover, it cannot be determined whether any designated party "fails to comply with the order" unless and until the final CAO has been issued and a party fails to comply with those directives. (DTR § 11.2.) It is the Port District's burden to establish it is not primarily liable. See § III-A, *infra*. The Port District has failed to meet its burden.

**Comment ID:** 446

**Organization:** BAE Systems

**DTR Section:** 11

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

IV.THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES  
HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING  
POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS

The Port District contends that it cannot be named as a discharger as a result of its ownership of its MS4 facilities because "[t]he DTR contains no evidence that Port discharges from its MS4 are contributing to the Shipyard Sediment Site contamination." (Port District's comments at 15.) "There is no evidence that SW4 or SW9 discharged any pollutants," the Port District claims. (*Id.* at 17.) The Port District's positions, however, are incorrect. There is substantial and reasonable evidence to support the DTR's assertion that the Port District's discharges into and through the SW4 storm drain outfall have contributed to elevated levels of pollution at the BAE Systems Leasehold.

**Comment ID:** 447

**Organization:** BAE Systems

**DTR Section:** 11.3

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES  
HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING  
POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS

A. Regional Boards Should Review Evidence with a View Towards Liability

To be named as a discharger, all that is required is "sufficient evidence" of responsibility. See The State Board Water Quality Enforcement Policy, No. 2002-0040, (Feb. 19, 2002). To this end, "a regional water board shall "[u]se any relevant evidence, whether direct or circumstantial" in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added). The resolution provides a number of potential sources of evidence, including site characteristics and location in relation to other potential sources of a discharge; hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality; industry-wide operational practices that have led to discharges, such as conveyance systems; and physical evidence, such as analytical data. (Id.)

In light of the Act's declared objective and the broad discretion granted to regional water boards by the Act and its implementing regulations, State Water Board decisions suggest that a regional water board should look at evidence with a view toward finding liability. According to the State Water Board, "[g]enerally speaking it is appropriate and responsible for a Regional Board to name all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility." See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 11 (SWRCB 1985) (noting further that "substantial evidence" means "credible and reasonable evidence which indicates the named party has responsibility"); Stinnes-Western Chemical Corp., Order No. 86-16, at 12 (SWRCB 1986) (same).

**Comment ID:** 448

**Organization:** BAE Systems

**DTR Section:** 11.3

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.'s reply to the san diego unified port district's comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT'S MS4 FACILITIES  
HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING  
POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS

B. NRDC is Inapposite and Does Not Apply the Evidentiary Standard Applicable in  
Administrative CAO Proceedings

The Port District heavily relies on Natural Res. Def. Council, Inc. v. County of Los Angeles, 636 F.3d 1235 (9th Cir. 2011) (hereafter "NRDC") to argue that the evidence upon which the DTR relies is inadequate. This case is of no relevance here. In NRDC, the plaintiffs sought to impose liability on municipal defendants for violations of the Federal Clean Water Act for what the plaintiffs contended were exceedances of the water-quality standards contained in the defendants' respective NPDES permits. (Id.) The evidence required to demonstrate an unlawful exceedance is different from the evidence required to be named as a discharger in a cleanup and abatement order. As noted, the Regional Board has broad discretion to name dischargers in a cleanup and abatement order, and all that is required to exercise that discretion is "credible and

reasonable evidence which indicates the named party has responsibility.” See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 12 (SWRCB 1985). It is for this reason that courts review agency decisions under an abuse of discretion standard. See *Topanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal. 3d 506, 515 (1974) (noting that the agency which renders the challenged decision is only required to “set forth findings to bridge the analytic gap between the raw evidence and ultimate decision or order”). Thus, the Ninth Circuit’s assessment of the degree of proof necessary to hold an entity liable for a NPDES Permit exceedance has no bearing on the evidence required to name the Port District as a discharger in the TCAO, and consequently Natural Res. Def. Council is fundamentally distinguishable and should be disregarded.

Moreover, Natural Res. Def. Council is inapposite because it is an action brought under the Clean Water Act centered on whether a NPDES permittee had violated the NPDES permit limits. Conversely, in the instant action, the issue is whether the Port District discharged contaminants to the Site that have contributed to the contamination. The DTR makes clear that urban runoff from the Port’s MS4 facilities has been discharged to the Site, contributing to the contamination by exceeding applicable water quality objectives for the Bay. (DTR, Finding 11.) The DTR does not allege the Port District violated its NPDES permit.

Even if the Natural Res. Def. Council case has any applicability to these proceedings, the Ninth Circuit’s ruling does not relieve the Port District of liability for contaminants it conveyed to the San Diego Bay. The Ninth Circuit made clear that the Clean Water Act “does not distinguish between those who add and those who convey what is added by others—the Act is indifferent to the originator of water pollution.” *NRDC*, 636 F.3d 1235, 1252-53. In fact, according to the Ninth Circuit, the Clean Water Act bans “the discharge of any pollutant by any person” regardless of whether that “person” was the root cause or merely the current superintendent of the discharge.” *Id.* at 1253 (internal quotations and citation omitted). Thus, as the Fifth Circuit has held, so long as the MS4 is “the means by which the pollutants are ultimately deposited into a navigable body of water,” the party can be held liable for those discharges, regardless of any permit. *Sierra Club v. Abston Constr. Co.*, 620 F.2d 41, 45-46 (5th Cir. 1980).

Accordingly, so long as there is sufficient evidence, either direct or circumstantial, to find that the Port District’s SW4 outfall has contributed to elevated levels of pollution at the Site, the DTR’s conclusion is correct.

**Comment ID:** 449

**Organization:** BAE Systems

**DTR Section:** 11.4, 11.6.4, Table 4-4, p. 11-6

**Comment:**

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BAE Systems San Diego Ship Repair, Inc.’s reply to the san diego unified port district’s comments

THE DTR PROPERLY CONCLUDES THAT THE PORT DISTRICT’S MS4 FACILITIES HAVE AND ARE DISCHARGING WASTE TO SAN DIEGO BAY CREATING POLLUTION, CONTAMINATION AND NUISANCE CONDITIONS

C.Substantial and Reasonable Evidence Supports the DTR’s Assertion That the Port District's SW4 Outfall has Contributed to Elevated Levels of Pollution at the Site

The DTR properly concludes that the Port District's SW4 outfall has contributed to elevated levels of pollution at the BAE Systems Leasehold. The Port District does not dispute that it has MS4 facilities that lead to SW4. (Port District's comments at 17.) In fact, the Port District's (untimely) proffered expert opinion of Mr. Collacott admits that the "portion of the Port District that is not leased to tenants and is tributary to outfall SW4 is limited to portions of Belt Street (approx. 1 acre) consisting of an estimated one-half mile (1/2 mile street) of curb and gutter, four storm drain inlets, and an estimated 770 feet of underground storm drains 24-inches in diameter and smaller." (Declaration of Robert Collacott In Support of the San Diego Unified Port District's Submission of Comments, Evidence and Legal Argument, at 4:9-14.) Presumably the Port District has owned and operated this tributary system to outfall SW4 since 1962.

SW4 has historically received runoff from Belt Street (among other areas). (DTR, p. 11-6.) That fact, coupled with the Port District's own statements regarding the scope of portions of its MS4 facilities, reflects an admission by the Port District that municipal wastewater from its own MS4 facilities is discharged into SW4 where it is discharged to the Site at the BAE Leasehold. As reflected below, substantial and reasonable evidence exists that supports the DTR's MS4 allegations and findings against the Port District. Importantly, "a regional water board shall "[u]se any relevant evidence, whether direct or circumstantial" in order to establish the source of a discharge. State Water Board Resolution No. 92-49, at § II(A) (emphasis added).

#### 1.2009 SW4 Sampling Data Detects PCBs, Copper, TBT and Mercury

On December 7, 2009, water quality data from SW4 were collected from a manhole on the BAE leasehold. (CalScience Environmental Laboratories, 2009). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. Laboratory analyses included a congener-level analysis of PCBs. Multiple congeners were detected, and the highest concentrations were of penta- and hexa-chlorinated biphenyls, similar to the profile of Aroclor 1254. (Id.) Copper, mercury, and TBT were also measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of 2009 there was an ongoing source of PCBs, copper, mercury and TBT from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2009 have dissipated, nor have upland source control measures been established, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain an ongoing source of these COCs to the Site.

#### 2.2005 SW4 Sampling Data from City Investigation Detects PCBs and PAHs

Further evidence of discharges from storm drain SW4 into the Shipyard sediment site is provided by the results of a sampling investigation conducted by the City of San Diego. As described in the DTR (section 4.7.2), on October 3, 2005, the City conducted an investigation and observed evidence of an illegal discharge into the SW4 catch basin on the north side of Sampson Street between Belt Street and Harbor Drive, approximately 10 feet east of the railroad line that runs parallel with Belt Street. Specifically, the catch basin is located immediately to the east of the BAE Systems' parking lot and the SDG&E Silver Gate Power Plant, which is adjacent to the parking lot. As noted above, the Port District admits that its own MS4 facilities drain the Belt Street area and discharge to the Bay via SW4.

During the City's investigation, three sediment samples were collected and analyzed for PCBs and polycyclic aromatic hydrocarbons (PAHs). The first sample was collected from inside and at the base of a six-inch lateral entering the catch basin from the east. The second sample was collected from inside and at the base of the 12-inch lateral entering the catch basin from the north. The third sample was collected from the 18-inch pipe exiting the catch basin. The results



of these three samples, presented in DTR Table 4-4, indicate the presence of PCBs and PAHs entering and exiting the municipal storm drain system catch basin. The results of this sampling show significant concentrations of Aroclor 1254 and 1260. (DTR Table 4-4.) The Port District has cited no evidence or even argument to the contrary. Thus this data is further evidence of the Port District's illicit discharges of contaminants through its MS4 facilities that discharged directly to the Site.

### 3.2001 SW4 Sampling Data Detects TBT, Copper and Mercury

On November 29, 2001, water quality data from SW4 were collected from a manhole on the BAE leasehold. (AMEC, 2001). This sample was collected from the first manhole inside the BAE Systems leasehold, prior to any possible input from the site. TBT, copper, and mercury were all measured and detected in the urban stormwater conveyed by SW4. (Id.) These data indicate that as of late 2001 there was an ongoing source of TBT, copper, and mercury from urban runoff that discharged to the Site at SW4. No data suggests that contaminants found in late 2001 have dissipated, nor have upland source control measures been established, and moreover the 2009 SW4 data again detects these same COCs in addition to PCBs, and therefore it is reasonable to conclude that MS4 and outfall SW4 remain ongoing sources of these COCs to the Site.

### 4. Historical Discharges by the Port District into SW4 have Significantly Contributed to Contamination at the Site

In 1974 the Southern California Coastal Water Research Project ("SCCWRP") published the results of an EPA-funded study entitled "Marine Inputs from Polychlorinated Biphenyls and Copper from Vessel Antifouling Paints." (Young et al., 1974.) The project surveyed the usage of PCB-containing hull paint on recreational, commercial, and Navy vessels in San Diego Bay and other southern California bays, and also collected data on PCB releases in municipal wastewater and storm runoff. (Id.)

Contrasting the PCB mass release rates for different sources (Table 12 in Young et al. 1974) shows that municipal wastewater was a major source of Aroclor 1254 to San Diego Bay, contributing more than 99.9 percent of total PCBs. Thus, as of 1974, municipal wastewater carried by the Port District's MS4 system and discharged via SW4 was a significant source of PCB contamination at the BAE Leasehold. (Id.) The Port District identifies no study or data indicating that the sources of PCBs to the San Diego Bay was by any means other than those identified by Young, et al. Absent findings to the contrary, it is reasonable to conclude that the Port District was a significant contributor of PCBs to the San Diego Bay at least from its creation in 1962 through the 1974 date of the SCCWRP study, and likely longer.

### 5. EPA Guidance Confirms that Waste Water Discharged by the Port District into SW4 has Significantly Contributed to Contamination at the Site

Relevant EPA guidance supports the DTR's findings with respect to waste in urban storm water discharged by the Port District into the SW4 outfall at the BAE Leasehold. In 1983 the EPA published "Results of the Nationwide Urban Runoff Program." The Executive Summary states that among the many objectives of the National Urban Runoff Program ("NURP") was to develop analytical methodologies to examine "the quality characteristics of urban runoff, and similarities or differences at different urban locations" and "the extent to which urban runoff is a significant contributor to water quality problems across the nation." (EPA, Results of the Nationwide Urban Runoff Program, Executive Summary at p. 1.) "The NURP studies have greatly increased our knowledge of the characteristics of urban runoff, its effects upon

designated uses, and of the performance efficiencies of selected control measures." (Id. at p. 2.)  
The NURP Final Report reached several relevant conclusions, including:

- "Heavy metals (especially copper, lead and zinc) are by far the most prevalent priority pollutant constituents found in urban runoff. End-of-pipe concentrations exceed EPA ambient water quality criteria and drinking water standards in many instances. Some of the metals are present often enough and in high enough concentrations to be potential threats to beneficial uses." (Id. at p. 5.)

- "Total suspended solids concentrations in urban runoff are fairly high in comparison with treatment plant discharges. Urban runoff control is strongly indicated where water quality problems associated with TSS, including build-up of contaminated sediments, exist." "[T]he problem of contaminated sediment build-up due to urban runoff...undeniable exists." (Id. at p. 6.)

- "A summary characterization of urban runoff has been developed and is believed to be appropriate for use in estimating urban runoff pollutant discharges from sites where monitoring data are scant or lacking, at least for planning level purposes." (Id. at p. 7.)

With respect to this last conclusion regarding the development of a summary characterization, the NURP Report states that "[a]lthough there tend to be exceptions to any generalization, the suggested summary urban runoff characteristics given in Table 6-17 of the report are recommended for planning level purposes as the best estimates, lacking local information to the contrary." (Id. at p. 7.) "[I]n the absence of better information the data given in Table 6-17 are recommended for planning level purposes as the best description of the characteristics of urban runoff." (EPA, Results of the Nationwide Urban Runoff Program, Volume I – Final Report, at p. 6-43.) Those characteristics of urban runoff include the presence of significant levels of pollutants including total suspended solids, heavy metals, inorganics, and pesticides. (Id., at Tables 6-17 through 6-21.) The NURP data supports and confirms the DTR's assertion that:

"The Port District has caused or permitted the discharge of urban storm water pollutants directly to San Diego Bay at the Shipyard Sediment Site. The pollutants include metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), TSS, sediment (due to anthropogenic activities), petroleum products, and synthetic organics (pesticides, herbicides, and PCBs) through its SW4 (located on the BAE Systems leasehold) and SW9 (located on the NASSCO leasehold) MS4 conduit pipes."  
(DTR, § 11.4.)

The NURP data also supports and confirms the DTR's assertion that "it is highly probable that historical and current discharges from [SW4] outfall have discharged heavy metals and organics to San Diego Bay at the Shipyard Sediment Site." (DTR § 11.6.4.)

**Comment ID:** 450  
**DTR Section:** 11  
**Comment:**

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**Organization:** BAE Systems

BAE Systems San Diego Ship Repair, Inc.'s reply to the San Diego Unified Port District's comments

## V. PORT DISTRICT'S UNTIMELY AND IMPERMISSIBLE EXPERT DECLARATIONS

As set forth in BAE Systems' concurrently filed Motion to Exclude Declarations of the Port District's Experts Michael Johns, Ph.D., Ying Poon, D.S.C., and Robert Collacott, MBA M.S., the Regional Board should exclude and strike those untimely and impermissible expert opinion, and should disregard those portions of the Port District's May 26, 2011 comments that rely upon and discuss that expert opinion.

In the event the Regional Board declines to grant BAE Systems' motion to exclude, BAE Systems joins in NASSCO's Reply to Comments by the San Diego Unified Port District filed on June 23, 2011 with respect to the substance of those three expert declarations.

**Comment ID:** 451

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

**BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS**

## I. INTRODUCTION

The California Regional Water Quality Control Board, San Diego Region ("Regional Board") Cleanup Team currently identifies SDG&E as a "discharger" and "person responsible," in the TCAO based on substantial, reasonable and credible evidence that discharges from the Silver Gate Power Plant contributed to the accumulation of pollutants in marine sediments at the Shipyard Sediment Site.

SDG&E's Rescindment Request is based on two central arguments, neither of which have any merit. First, SDG&E claims that the Cleanup Team relied on "speculative" allegations in reaching its conclusion. There is nothing "speculative" about the evidence. The Silver Gate Power Plant was constructed in the 1940s and 1950s. It was a steam turbine power plant that operated at peak capacity for over thirty years. There were many sources of polychlorinated biphenyls ("PCBs"), copper, and mercury within equipment located throughout the plant. This equipment leaked and, along with other waste water, was discharged to the San Diego Bay ("Bay") via the cooling water tunnels, storm water run-off, and SDG&E's tidelands disposal ponds and oil/water separators. This is confirmed by the Administrative Record, deposition testimony of members of the Cleanup Team, data and documents prepared by SDG&E and its own consultants, and additional documents either produced by SDG&E and other parties in the pending United States District Court case or otherwise publicly available (which are filed herewith, augmenting the Administrative Record).

Second, SDG&E argues that the Cleanup Team "ignored the obvious." That is, "BAE" is solely responsible for the contamination found on the Northern portion of the Shipyard Sediment Site. In making this argument, SDG&E fails to distinguish between BAE Systems and previous, distinct, shipyard entities that operated at the Northern portion of the Shipyard Sediment Site

since 1914. BAE Systems only operated at the Shipyard Sediment Site since 1979 and has no responsibility for the discharges which occurred during the prior 65 years by other owners and operators that have no relationship to BAE Systems. Further, it is not appropriate for the Regional Board to allocate liability through these proceedings {SDG&E uses the Rescindment Request to argue that the Regional Board should allocate liability to BAE Systems by conflating it with prior owners and operators and by identifying evidence that it believes supports its position. As noted above, rather than refute every instance in the Rescindment Request, BAE Systems generally objects to the singular definition of “BAE” to include prior owners and operators. Further, BAE Systems generally, and in connection with the pending litigation, reserves its rights relative to the allegations and evidence cited in the Rescindment Request. The focus of this Response is on SDG&E’s status as a discharger, rather than on BAE Systems’ status as a discharger}. Finally, SDG&E relies on an expert opinion from ENVIRON that TBT should be a cleanup “driver.” This opinion, however, is wrong and untimely under the relevant discovery order and should be excluded { BAE has filed herewith a Motion to Exclude ENVIRON’S Technical Comments submitted by SDG&E.}.

The Regional Board was correct to designate SDG&E as a discharger and, for the foregoing reasons, and the reasons set forth in more detail below, the Regional Board should deny the Rescindment Request.

**Comment ID:** 452

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.’S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY’S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS

## II. THE REGIONAL BOARD APPLIED THE PROPER LEGAL STANDARD IN DESIGNATING SDG&E AS A DISCHARGER

The Regional Board properly designated SDG&E as a discharger and responsible party under the TCAO. The Regional Board has broad latitude to issue Cleanup and Abatement Orders (“CAOs”) when necessary to protect California’s water resources from contamination. (Cal. Water Code §13304(a).) Specifically, the Regional Board may issue CAOs to the following: (1) “any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board;” or (2) any person “who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance.” (Id.)

To name SDG&E as a discharger, all the Regional Board needs is “sufficient evidence” that SDG&E caused any amount of waste to be discharged to the Shipyard Sediment Site. (See The State Board Water Quality Enforcement Policy, No. 2002-0040 (February 19, 2002).) And, the Regional Board shall “[u]se any relevant evidence, whether direct or circumstantial” to establish SDG&E’s status as a discharger. (State Water Board Resolution No. 92-49 at §IIA (emphasis added).) According to the State Water Board, “[g]enerally speaking it is appropriate and

responsible for a Regional Board to name all parties for which there is reasonable evidence of responsibility, even in cases of disputed responsibility.” (See, e.g., Exxon Company U.S.A. et al., Order No. 85-7, at 11 (SWRCB 1985)(emphasis added); Stinnes-Western Chemical Corp., Order No. 86-16, at 12 (SWRCB 1986).) “[R]easonable evidence” means “credible and reasonable evidence which indicates the named party has responsibility.” (Id.)

The Regional Board conducted years of investigation, and considered a vast amount of evidence before designating SDG&E as a discharger {Additional evidence, both direct and circumstantial, has been generated since the TCAO was issued. Some of this evidence has been added to the Administrative Record, and is discussed further below. Other evidence, including documents subsequently produced by SDG&E and other documents from industry sources and technical studies are submitted herewith to supplement the Administrative Record. This evidence further supports the Regional Board’s designation of SDG&E as a discharger in the TCAO and DTR, and readily surpasses the applicable evidentiary standard that must be applied here.}. Its investigation and the evidence revealed that SDG&E had caused waste to be discharged to the Bay where it created a condition of pollution. As a result, the Regional Board applied the legal standard properly when it designated SDG&E as a discharger under the TCAO.

**Comment ID:** 453

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.’S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY’S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS

### III.THE REGIONAL BOARD’S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

SDG&E contends that the findings in Section 9 of the DTR are “speculative,” and not based upon substantial, reasonable and credible evidence. SDG&E is wrong. The Regional Board not only has sufficient evidence, but also substantial, reasonable and credible evidence supporting its decision to designate SDG&E as a discharger -- SDG&E caused waste to be discharged to the Bay via its cooling water tunnels, the storm drainage system, and its tidelands waste ponds and oil/water separators. And, contrary to SDG&E’s claim, the Cleanup Team’s designation of SDG&E as a discharger was not based upon the Cleanup Team’s acquiescence to other parties’ demands to “get more people on board.” (Rescindment Request at 1:14-16.) Instead, it was based upon there being “a lot of good reason to suspect that a major power plant [that] was in operation for 50 years, plus or minus, might have had some discharges” into the Shipyard Sediment Site, and evidence that demonstrated that it did. (Deposition of Craig Carlisle (“Carlisle Depo.”), Vol. II at 216:19-218:1.)

SDG&E’s Silver Gate Power Plant formerly located at 1348 Sampson Street, San Diego, California, operated for forty-one years from approximately 1943 until 1984 as a steam turbine power generation plant. (ENV America, Site Assessment (July 14, 2004)( SAR193330-193348).) The facility consisted of the main power plant, which held four generating units and the equipment associated with those units, the switchyard and substation (“switchyard”), which contained seventy-five oil circuit breaker tanks and four transformers above three underground

storage tanks, the cooling water deck, the cooling water tunnels, which ran from the power house beneath Belt Street and SDG&E's tidelands parcel and into the San Diego Bay ("Bay"), and the tidelands parcel. (Id.; Exponent Comments on 13267 Responses (September 29, 2004)(SAR193272-193329).)

#### 1. The Silver Gate Main Power Plant

The main power plant contained four steam turbines, eight turbine lubricating tanks with a capacity of 2,500 to 3,000 gallons each, two transformers located beneath two of the generating units, and six boilers. (Id.) The transformers contained dielectric fluid, which contained PCBs. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972); EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).) Transformers containing PCBs were used from the 1950s until 1979 when PCBs were banned. (Id.) This overlaps the peak years of operation for the Silver Gate Power Plant. And, after 1979, the transformers at the Silver Gate Power Plant still contained PCBs. (EnecoTech Southwest, Inc., Phase II Investigation Services, PCB Investigation (April 29, 1997).)

Dielectric fluids typically contain from sixty to seventy percent PCBs by weight. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987).) The PCB Aroclors found in transformer dielectric fluid include Aroclors 1254 and 1260. (Id.; Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).) According to the United States Environmental Protection Agency, leaks of dielectric fluids from valves and seals on transformers were common, and leaks and spills vary in size from half a pound to sixty-four pounds of dielectric fluid. (Id.; EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).)

PCBs also were commonly used in coolant oil, turbine lubricating oil, and hydraulic fluids at steam generation power plants from the 1950s until the late 1970s because of the fire resistant properties of PCBs. (W. David Phillips, The Use of a Fire-Resistant Lubricant: Europe Looks to the Future in Turbine Lubrication in the 21st Century (2001); A.C. M. Wilson, Fire-Resistant Fluids for General Hydraulic and Steam Turbine Systems (February 1967); see also EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972); EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).) The use of PCBs in various oil products typically used in steam generation power plants also overlaps the primary years that the Silver Gate Power Plant operated. According to industry documents and United States Environmental Protection Agency documents, leaks and disposal of these types of fluids were common as the systems were only partially closed, and these fluids are rarely re-used. (Id.) Typically, coolant, turbine lubrication and hydraulic oils contain PCB Aroclors 1248, 1254 and 1260. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).)

All leaks from the transformers, turbines, turbine lubricating tanks and any hydraulic equipment collected in the trenches of the turbine side of the power plant, and were discharged via the discharge cooling water tunnel to the Bay from 1943 until 1977. (Exponent Comments on 13267 Responses (September 29, 2004)(SAR156879-156889); ENV America, Technical Report for RWQCB Investigation Order No. R9-2004-0026 (July 14, 2004) (SAR193272-193329).) And, before 1977 when SDG&E commenced operation of a wastewater treatment facility, liquid wastes were not treated before being discharged through the discharge cooling water tunnel. (Id.)

Further, maintenance required the boilers to be cleaned using certain chemicals. (Dowell Vertan 675 Chemical Cleaning Instructions and Schedule for Boilers 5 and 6.) The resultant waste contained dissolved metals such as iron, copper (one of the primary constituents of concern (“COCs”) in the TCAO), chromium, and nickel. (Id.) Boiler blowdown, bilge water from the boiler side of the plant and wastes from boiler cleaning collected in the trenches on the boiler side of the plant, and were pumped or disposed of in unlined ponds or oil/water separators located on the tidelands. (ENV America, Technical Report for RWQCB Investigation Order No. R9-2004-0026 (July 14, 2004) (SAR193272-193329).)

## 2. The Silver Gate Power Plant Switchyard

The switchyard’s seventy-five oil circuit breaker tanks and four transformers also contained dielectric fluid, which contained PCBs. (SDG&E Daily PCB Inspection Reports; SDG&E Internal Correspondence PCB Cleanup (May 14, 1981); SDG&E Letter to Fire Marshall (November 27, 1985); EPA Region 9 Toxics and Waste Management Division Inspection Report (April 27, 1987).) It is well documented from the United States Environmental Protection Agency and other industry reference sources that transformers and circuit breakers contained PCBs from as early as the 1940s. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972); EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).)

Like the transformers in the main power plant, the transformers and oil circuit breakers in the Silver Gate Power Plant switchyard commonly leaked, releasing PCBs to the surrounding soil. (SDG&E Daily PCB Inspection Reports; SDG&E Internal Correspondence PCB Cleanup (May 14, 1981); SDG&E Letter to Fire Marshall (November 27, 1985); EPA Region 9 Toxics and Waste Management Division Inspection Report (April 27, 1987); see also EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972); EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006). )

For example, many of the transformers in the switchyard contained Inerteen, which was Westinghouse’s trade name for a dielectric fluid containing approximately sixty percent PCB Aroclor 1260. (List of Substation Equipment (November 3, 2004); EPA Superfund, Explanation of Significant Differences: Westinghouse Electric Corp. (February 14, 1997).) And, transformer and circuit breaker fluid commonly contained PCB Aroclors 1254 and 1260. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T.

Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).) As noted below, both Aroclors 1254 and 1260 were found in areas of the Shipyard Sediment Site and in upland areas at the former Silver Gate Power Plant Site.

The Silver Gate Power Plant switchyard had inadequate containment surrounding the transformers and circuit breakers, allowing PCBs to contaminate switchyard soil. (EPA Region 9 Toxics and Waste Management Division Inspection Report (April 27, 1987).) The switchyard also housed underground storage tanks (“USTs”) that stored over 75,000 gallons of oil. (Woodward-Clyde Consultants, Underground Tank Assessment SDG&E Silver Gate Station (November 18, 1986).) There were leaks of oil from the USTs and piping associated with the USTs. (Id.; TN & Associates, Underground Storage Tank Closure Report (November 13, 2006)(SAR373807-374069).)

### 3. The SDG&E Silver Gate Power Plant Tidelands

Finally, SDG&E used the land it leased on the tidelands to store untreated liquid wastes in unlined ponds and oil/water separators from 1950 until 1977. (ENV America, Site Assessment (July 14, 2004)( SAR193330-193348).) The ponds and oil/water separators were located in close proximity to the Bay, and often overflowed. (Id.) In addition to these unlined liquid waste disposal ponds, in the early 1950s, a trench existed that ran from a pond to the edge of the tidelands, enabling wastes from the ponds to be discharged directly to the Bay. (Letter from Walter Zitlau to M. Hjalmarson (May 1, 1950); SAR193371.) As will be discussed further below, the untreated liquid wastes SDG&E discharged to the ponds and oil/water separators located on the tidelands contained PCB Aroclors 1254, 1260 and 5460, copper, and mercury, and the PCBs, copper and mercury were discharged to the Bay via the trench, overflows of the ponds and oil/water separators, and storm water run-off. Thus, there is substantial, reasonable and credible evidence that the SDG&E Silver Gate Power Plant contributed to the contamination of sediments at the Shipyard Sediment Site.

**Comment ID:** 454

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.’S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY’S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS

THE REGIONAL BOARD’S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

A. DTR Sections 9.6 and 9.7 are Supported by Substantial, Reasonable and Credible Evidence.

DTR Sections 9.6 and 9.7 describe waste discharges from the Silver Gate Power Plant cooling water tunnels to the Bay, and contrary to SDG&E’s assertion, set forth substantial, reasonable and credible evidence sufficient to support SDG&E’s discharger status in the TCAO.

The Silver Gate Power Plant began operating in 1943, with the completion of construction of Unit 1 in 1943, (ENV America, Site Assessment (July 14, 2004)(SAR193330-193348), more



than 30 years before SDG&E constructed its wastewater treatment system and became subject to an NPDES permit regulating its wastewater discharges to the Bay. SDG&E's wastewater treatment system was not completed until 1977. (Id.) SDG&E constructed the wastewater treatment system to bring its discharges from the cooling water tunnels into compliance with the Regional Board's rules and regulations. (SDG&E Power Plant Wastewater Treatment Facilities Project Design Guide (March 26, 1976).)

From 1943 until 1976, SDG&E did not treat any of the liquid wastes generated at the Silver Gate Power Plant before those wastes were discharged to the Bay. Diagrams of the Silver Gate Power Plant show that bilge water from the turbine side of the power plant was piped to the discharge cooling water tunnels. (ENV America, Technical Report for RWQCB Investigation Order No. R9-2004-0026 (July 14, 2004) (SAR193272-193329).) Basement bilge water from the turbine side of the power plant accumulated in the trenches of the basement of the turbine side of the power plant where two transformers were housed below the Unit 3 and 4 turbines. (Id.; November 27, 1985 Letter from SDG&E to the Fire Marshall.) As discussed above, leaks of dielectric fluids from valves and seals on transformers were common, and leaks and spills could vary in size from half a pound to sixty-four pounds of dielectric fluid. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972); EPA, Polychlorinated Biphenyl Inspection Manual (August 2004); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).) The grades of Aroclors used in transformers were Aroclors 1254 and 1260. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls, Table 7 (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).)

In addition, the turbine side of the power plant had eight turbine lubricating oil tanks with a capacity of 2,500 to 3,000 gallons each. (Exponent Comments on Parties 13267 Responses (September 29, 2004) (SAR156879-156889).) Coolant oil and turbine lubricating oil contained PCBs from at least the 1940s until the 1970s, and both the coolant oil and turbine lubricating oil leaked from the transformers and turbines into the bilge water in the trenches of the turbine side of the power plant. (Id.; See A.C.M. Wilson, Fire-Resistant Fluids For General Hydraulic And Steam Turbine Systems (1967) (documenting that the leakage of lubricants from turbine hydraulic and lubrication systems was common, and that PCBs were used in those lubricants as a fire resistant fluid); W. David Phillips, The Use of a Fire-Resistant Turbine Lubricant: Europe Looks to the Future in Turbine Lubrication in the 21st Century (2001)(Due to the occurrence of steam turbine fires associated with hydraulic and lubricating oil leaks in steam turbines, fire-resistant fluids containing PCBs were used from the 1940s to 1970s.); EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987) ("PCBs were employed in ... hydraulic and lubricant applications because they exhibited good heat and fire resistance ....").) Hydraulic fluids and lubricants used in equipment at Silver Gate likely contained PCB Aroclors 1254 and 1260. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls, Table 7 (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).)

Environmental investigations at the Silver Gate Power Plant further demonstrate that SDG&E discharged PCBs, copper and mercury via the cooling water discharge tunnel. In March 2005,

SDG&E hired RBF Consulting to conduct a Phase I Environmental Site Assessment of the Silver Gate Power Plant. (RBF Consulting, Phase I Environmental Site Assessment (March 2005).) In preparing the assessment, RBF reviewed and summarized a prior Phase I and Phase II conducted by IT Corporation in 2000 and 2001 respectively. The recognized environmental conditions identified by IT Corporation, and summarized by RBF, concluded that the plant trench system, sumps, voids and cooling water tunnels contained metals, and PCBs. (Id.)

Sampling by TN & Associates and Ninyo and Moore later confirmed the recognized environmental condition identified by IT Corporation. TN & Associates sampled the sediment in the basement trench system from the turbine side of the power plant, and issued a report of the results of its samples in December 2006. (TN & Associates, Silver Gate Power Plant Basement Trench System Sediment Sampling (December 21, 2006).) All samples showed levels of PCB Aroclors 1254 and 1260, and copper above reporting limits, and three of the four areas sampled showed levels of mercury above reporting limits. (Id.) Ninyo & Moore collected four samples from the cooling water tunnels in December 2010. (Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011).) Two of the three samples collected from the discharge tunnels contained PCB Aroclors 1254 and 1260 above the method detection limit, and copper and mercury above the reporting limits. (Id.) PCB Aroclors 1254 and 1260 are the same Aroclors found in the SDG&E tidelands soil in the location of the former wastewater ponds and oil/water separators (ENV America, Site Assessment (July 14, 2004); Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011), in soil in the switchyard (TN & Associates, Underground Storage Tank Closure Report (November 13, 2006) (SAR373807-374069), in transformer dielectric fluids in the transformers at the Silver Gate Power Plant, and in hydraulic, coolant and lubricating oils used in the plant (Environmental Protection Agency, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls, Table 7 (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972)).

In addition, Aroclors 1254 and 1260 tend to co-occur in approximately the same concentrations in four out of the five sediment samples collected from the cooling water tunnels. (Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011).) The approximate 1254 to 1260 ratio had a range of 0.9 to 1.1 of 1254 to 1 of 1260. (See id.) Sediment samples from locations in front of the discharge cooling water tunnel and covering an area extending at least 600 feet offshore and 400 feet along the shoreline had an approximate 1254 to 1260 ratio range of 0.7 to 1.3 of 1254 to 1 of 1260, which is nearly identical to that of the sediments sampled in the cooling water tunnels. (Exponent, 2003 (SAR105417-105996); Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011).) The nearly identical ratio of co-occurrence of Aroclors 1254 and 1260 in the cooling water tunnel sediment samples and the Bay sediments indicates that the PCBs in the sediments had a common source -- the SDG&E discharge cooling water tunnel.

In addition, the spatial distribution of PCBs in sediment North of Pier 1 also indicates that SDG&E's discharge cooling water tunnel is the source of PCBs, copper and mercury. A volume of 223 million gallons of water per day was discharged through the discharge cooling water tunnel. (ENV America, Technical Report for RWQCB Investigation Order No. R9-2004-026 (July 14, 2004)(SAR193272-193329).) The discharge cooling water tunnel was an eight foot square tunnel, making the velocity of discharge 1.6 meters per second. (Id.) Fine particles containing SDG&E wastes, including PCBs, copper and mercury, likely would not have settled in front of the cooling water outflow, but rather would have been distributed over a large area

across the Shipyard Sediment Site North of Pier 1. A 1942 drawing of the dredge plan and trajectory of discharge from the discharge cooling water tunnel also indicates that discharged wastes would have been dispersed hundreds of feet from the mouth of the outflow, and to the south of the discharge tunnel near Pier 1. (Proposed Dredging & Jetty on San Diego Bay, Application by SDG&E (April 20, 1942).) This pattern of dispersion of wastes from the discharge cooling water tunnel is exhibited by PCBs in sediment located North of Pier 1. The highest concentrations of PCBs in sediments North of Pier 1 are found in sediment samples hundreds of feet from, and to the south of the discharge tunnel near Pier 1. (Exponent, 2003 (SAR105417-105996)(Samples SW01 & SW02).)

As a result, there is substantial, reasonable and credible evidence supporting the allegations in Sections 9.6 and 9.7 of the DTR that SDG&E discharged PCBs and other COCs via the discharge cooling water tunnel. Based on the substantial, reasonable, and credible evidence in these sections of the DTR alone, SDG&E was appropriately designated a discharger by the Regional Board.

**Comment ID:** 455

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS

THE REGIONAL BOARD'S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

B.The Findings in DTR Section 9.8 are Based Upon Substantial, Reasonable and Credible Evidence

Contrary to SDG&E's assertion, there is substantial, reasonable and credible evidence in the Administrative Record, and in SDG&E documents supporting the Regional Board's designation of SDG&E as a discharger based upon SDG&E's discharges of PCBs from the Silver Gate Power Plant switchyard to the storm drain system, which discharges to the Bay. DTR Section 9.8 addresses allegations by the Regional Board stemming from SDG&E's unauthorized discharge of toxic pollutants at the Silver Gate switchyard in connection with the closure in place of three 220,000 gallon concrete USTs in 2006. SDG&E's consultant, TN & Associates, collected eighteen surface soil samples above the location of the USTs, and only 900 feet from the San Diego Bay. All of these samples were reported to contain PCBs, and eleven of the eighteen samples had PCB concentrations greater than 1,000 ug/kg. DTR Section 9.8 alleges that storm water run-off carried PCBs from soil at the Silver Gate substation to the northeast into the storm drain system that drains to the Bay at MS4 based upon the following three facts: (1) Aroclor 1260 was the only PCB reported in the 18 surface soil samples; (2) Aroclor 1260 was the highest PCB concentration reported in sediment samples collected from the MS4 catch basin, and (3) Aroclor 1260 was the highest PCB concentration reported in the Shipyard Sediment Site samples SW20 through SW25, which are in the vicinity of the MS4 outfall.

Despite this, SDG&E argues that the allegations in Section 9.8 are "speculative" because (1) the Silver Gate switchyard's containment structure would have prevented the PCBs from being

carried to the storm drain system in storm water run-off, (2) there is no support for the transport pathway alleged by the Regional Board to the storm drain system, and (3) the concentration of PCBs in the substation soil could not be a source of PCBs to the Bay because they were many times less than those found in the sediments in the Bay {Section III.E addresses SDG&E's arguments in the Rescindment Request that lower concentrations of contaminants in upland soils could not be a source of the higher concentrations of contamination in sediments at the Shipyard Sediment Site.}. SDG&E's arguments ignore the substantial, reasonable and credible evidence supporting the allegations in Section 9.8 of the DTR.

#### 1. The Substantial Leaks and Spills of PCBs from the Switchyard Were Not Adequately Contained.

SDG&E's Spill Prevention Control and Countermeasure Plan ("SPCC Plan") for the Silver Gate Power Plant from 1981 reveals that there were seventy-five oil circuit breaker tanks, and four transformers located in the switchyard. (SDG&E SPCC Plan (1981)(SAR193543-193544).) The transformers could hold up to 6,000 gallons of PCB-containing coolant oil, and the circuit breakers could hold up to 600 gallons of PCB-containing coolant oil. (Solid Waste Management Unit Information Data for Transformers and Circuit Breakers at Silver Gate Power Plant.) TN & Associates' November 13, 2006 Underground Storage Tank Closure Report demonstrates that there were releases of PCB Aroclor 1260 from past leaks of transformers and circuit breakers, and copper from painting operations in the switchyard area. Numerous SDG&E documents demonstrate that the transformers and circuit breakers in the switchyard continuously leaked since installation. For example, SDG&E inspections from 1981 to 1983 indicate there were leaks of coolant oil from the transformers and circuit breakers, and that SDG&E took no action to cleanup the leaks or repair the leaking transformers or circuit breakers. (SDG&E Daily PCB Inspection Reports.) And, despite the removal of 150 cubic yards of soil in 1986 in response to a leak of total extracted hydrocarbons from piping to the USTs, observation of the soil in the switchyard in 1987 and 1997 revealed PCB soil contamination from transformer and circuit breaker leaks. (Crosby & Overton, Site Assessment and Hydrocarbon Mitigation at the Silver Gate Power Plant (November 10, 1987); EPA Region 9 Toxics and Waste Management Division Inspection Report (April 27, 1987); EnecoTech Southwest, Inc., Phase II Environmental Investigation Services, PCB Investigation (April 29, 1997).)

In 1997, EnecoTech Southwest, Inc. conducted a Phase II PCB Investigation in the switchyard, and found Aroclors 1260 and 1254 in 32 soil samples collected near the transformers and circuit breakers. (EnecoTech Southwest, Inc., Phase II Environmental Investigation Services, PCB Investigation, (April 29, 1997).) Leaks from transformers and circuit breakers of the types found in the Silver Gate Power Plant switchyard occurred frequently, and industry research confirms that the average spill or leak ranged in size from one half pound to sixty four pounds, and that approximately ten percent of transformer fluid sales was to replace fluid that was leaked during the lifetime of these types of equipment. (EPA, Locating and Estimating Air Emissions from Sources of Polychlorinated Biphenyls (May 1987); Ian C.T. Nisbet et al., Rates and Routes of Transport of PCBs in the Environment in Environmental Health Perspectives (April 1972).)

Further, the inspection report from a February 5, 1987 inspection by EPA Region 9 Toxics and Waste Management Division indicated all of the following regarding the switchyard at the Silver Gate Power Plant: (1) inadequate roof and walls to prevent rain water from reaching stored PCBs; (2) inadequate floor with a minimum six inch high curb to provide containment of

a volume at least twice the internal volume of the largest stored container; (3) there are floor openings that would permit liquids to flow from the curbed area; (4) floors and curbing that are not constructed of smooth and impervious materials; and (5) spilled or leaked materials are not immediately cleaned up. (EPA Region 9 Toxics and Waste Management Division TSCA §6 PCB Investigation Inspection Report (April 27, 1987).) This inspection report confirms that leaked and spilled PCBs in the switchyard were not adequately contained to prevent storm water run-off from carrying the PCBs to the storm drain system and then to the MS4 storm drain outfall. In addition, this inspection report contradicts SDG&E's claim that the switchyard containment system was a "sophisticated, multifaceted containment structure." (Rescindment Request at 13:16-18.)

Finally, SDG&E misstates the Cleanup Team's testimony related to the findings in Section 9.8 of the DTR. For example, SDG&E claims that Craig Carlisle ("Carlisle") stated that "it might be useful to know" whether or not releases from the SDG&E facility were contained "at the time the release occurred." (Rescindment Request at 13:23-24.) However, what Carlisle actually stated was that information regarding whether a release was contained at the time the release occurred "might be useful depending upon your definition of containment and the integrity of such containment." (Carlisle Depo., Vol. II at 351:22-23.) And, Carlisle continued that in making the findings in Section 9.8, he "relied on the reports submitted on behalf of SDG&E, ENV America and TN & Associates," and that he did not think the two reports show that the releases were selected within a containment area. (Id. at 352:3-4, 9-16.) Contrary to SDG&E's assertions, there were continuous leaks of PCBs from equipment in the switchyard, and inadequate containment, such that it was certainly reasonable for the Regional Board to conclude that those PCBs were carried in storm water run-off to the Bay.

#### 2. Storm Water Run-off Carried PCBs from the Switchyard to the Bay.

SDG&E argues that because storm water run-off from the switchyard does not flow through catch basin 1 ("CB-1"), a catch basin located at the northeastern corner of the Silver Gate Power Plant, the Regional Board has failed to show that PCBs in soils at the switchyard could flow to the Bay via storm water run-off. However, SDG&E ignores the ample evidence that switchyard storm water run-off enters the storm drain system at the gutter on the northwest side of Sampson Street and is transported to the Bay at the MS4 outfall.

SDG&E admits that storm water run-off from the switchyard "would have flowed ... to the gutter on the northwest side of Sampson Street," but discounts this pathway because the Regional Board has not sampled the gutter. (Rescindment Request at 14:18-21.) But, sampling of the gutter is not necessary to show that switchyard storm water run-off contributed to a condition of pollution in the Bay. SDG&E's Onsite Hydrology/Drainage Study indicates that storm water from the switchyard drains to Sampson Street and into the 30-inch storm drain. (See SDG&E Onsite Hydrology/Drainage Study (March 14, 2006.) The 30-inch storm drain connects with another storm drain that discharges to the Bay at the MS4 outfall. (City of San Diego Map of Sampson Street Storm Drain from Belt Street to Harbor Street (February 27, 1985); City of San Diego Map of Portion of Sampson Street (June 22, 1988).)

The PCB Aroclors 1254 and 1260 were detected in the soil of the switchyard through sampling by TN & Associates and EnecoTech Southwest, Inc. Sediment sampling at the Shipyard Sediment Site in the vicinity of the MS4 outfall reported the highest concentrations of PCB Aroclors 1254 and 1260. The correlation between the PCB Aroclors found in soils at the Silver Gate Power Plant switchyard and in the vicinity of the MS4 outfall, where storm water run-off from the switchyard is discharged to the Bay, indicates that SDG&E's Silver Gate Power

Plant switchyard is a source of PCB Aroclors 1254 and 1260 to the Shipyard Sediment Site. While SDG&E relies on the report by TN & Associates entitled, "SDG&E Response to Silver Gate Power Plant Storm Water Discharge NOV No. 5408" to refute the Regional Board's finding, it does not appear to be in the Administrative Record, and SDG&E did not include it with their submission of evidence supplementing the Administrative Record. If the report is not part of the Administrative Record, it cannot be considered by the Regional Board as evidence, and any arguments based upon it must be disregarded. As discussed further in Section III.F below, the fact that concentrations in upland soils are lower than concentrations in sediments does not mean that those upland soils are not a source of contamination. As a result, there is substantial, reasonable and credible evidence that the SDG&E Silver Gate Power Plant switchyard was a source of PCB contamination in the vicinity of the MS4 outfall because PCBs from the switchyard were carried by storm water run-off into the 30-inch storm drain running beneath Sampson Street and into the Bay at MS4. The Regional Board's findings in Section 9.8 of the DTR are, therefore, not "speculative," and SDG&E's Rescindment Request should be denied.

**Comment ID:** 456

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS  
THE REGIONAL BOARD'S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

C.The Findings in DTR Section 9.9 are Based Upon Substantial, Reasonable and Credible Evidence

DTR Section 9.9 contains findings by the Regional Board that discharges from the SDG&E Silver Gate Power Plant contributed to pollution in the Shipyard Sediment Site in the area of the MS4 outfall. The Regional Board's findings are based upon a notice of violation issued by the City of San Diego ("City") to SDG&E after a City investigation revealed the presence of PCBs entering the storm water system at CB-1 from SDG&E's former Silver Gate Power Plant and exiting the storm water system to the Bay.

Initially, SDG&E's attack on Section 9.9 is misguided because it focuses on the fact that there are other potential sources of contamination to the Bay at the MS4 outfall. However, that fact is irrelevant to whether SDG&E should be designated a discharger by the Regional Board. As long as there is sufficient evidence demonstrating that SDG&E discharged some amount of waste to the Bay at the MS4 outfall, SDG&E should be designated a discharger. (See Cal. Water Code §13304; State Water Board Resolution No. 92-49.) Further, in arguing that DTR Section 9.9 is "speculative," SDG&E mischaracterizes the Cleanup Team's testimony on this subject. For example, SDG&E cites to Benjamin Tobler's ("Tobler") testimony, claiming that Tobler confirmed that the City's allegations against SDG&E were accepted at "face value" with no independent inquiry. (Rescindment Request at 17:5-6.) But, the Tobler testimony cited by SDG&E does not even discuss Section 9.9 of the DTR. (Deposition of Tobler ("Tobler Depo."))

57:7-59:10.) Instead, it discusses a section of the DTR containing findings related to BAE Systems. (Id.) SDG&E also cites to Craig Carlisle’s testimony, claiming Carlisle “admitted that he made no effort to do such a comparison between sediments in CB-1 and sediments in the catch basins or stormwater drains on BAE Systems’ property, and agreed it ‘may’ have been important to him.” (Rescindment Request at 17:26-28.) Carlisle actually testified that a comparison “may or may have not had bearing on” Section 9.9, and called the comparison a “hypothetical.” (Carlisle Depo., Vol. II at 311:17-312:3.)

Moreover, other evidence shows that SDG&E discharged wastes to CB-1 that were carried in the storm drain system to the Bay at the MS4 outfall. The City’s sampling of CB-1 contained PCB Aroclors 1260 and 1254. SDG&E conducted an investigation to determine whether the Silver Gate Power Plant was a source of contaminants to CB-1. (Letter from SDG&E to the City of San Diego (October 25, 2005).) SDG&E researched the sources of the two laterals carrying storm water into CB-1, and found that the 6-inch lateral entering CB-1 drained the turbine roof of Generating Unit 1 of the Silver Gate Power Plant. (Letter from SDG&E to the City of San Diego (December 1, 2005).) SDG&E sampled the roof of Generating Unit 1, as well as other areas around the Silver Gate Power Plant, and found PCBs {It is not surprising that PCBs were found on the roof of the Silver Gate Power Plant given the ubiquitous use of PCBs in various building materials and equipment used during the peak operating years of the plant. The United States Environmental Protection Agency reports that PCBs were used in various building materials, including paints, sealing and caulking compositions to seal joints against water, additives in cement and plaster, sealing liquids, and fire retardants. (EPA, Locating and Estimating Air Emissions From Sources of Polychlorinated Biphenyls (May 1987); EPA, An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000 (November 2006).) These applications were considered “open systems” due to the ease with which the PCBs may enter the atmosphere during use. (Id.)}. (Letters from SDG&E to the City of San Diego (January 10, 2006 & March 16, 2006).) SDG&E’s findings of PCBs in samples taken from various locations at the Silver Gate Power Plant is consistent with other sampling throughout the Silver Gate Power Plant, including sampling in the switchyard, which indicates that both Aroclors 1254 and 1260 were present at the plant, and were a source of PCBs to CB-1. (See, e.g., EnecoTech Southwest, Inc., Final Report for Phase II Environmental Investigation Services, PCB Investigation (April 29, 1997).)

Storm water entering CB-1 from the Silver Gate Power Plant is carried by an 18-inch lateral to a 30-inch storm drain culvert beneath Sampson Street, which then drains to the storm water outfall at MS4. (City of San Diego Map of Storm Drains.) The sediment samples in the area of the MS4 outfall contain PCB Aroclors 1254 and 1260, the same Aroclors found in CB-1, and found throughout the Silver Gate Power Plant, indicating that the Silver Gate Power Plant is a source of PCB Aroclors 1254 and 1260 to the Bay in the area of MS4. (Exponent, 2003 (SAR105417-105996).) The City notice of violation, SDG&E investigation, and Exponent sediment sampling provide substantial, reasonable and credible evidence supporting the Regional Board’s findings in Section 9.9 of the DTR. As a result, SDG&E’s Rescindment Request should be denied.

**Comment ID:** 457  
**DTR Section:** 9

**Organization:** BAE Systems

**Comment:**

**BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS  
THE REGIONAL BOARD'S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE**

D.The Findings in DTR Section 9.10 are Based Upon Substantial, Reasonable and Credible Evidence

SDG&E's claims about the findings in DTR Section 9.10 are also contrary to SDG&E's own records and consultants' reports demonstrating that SDG&E disposed of COC-containing wastes to ponds and oil/water separators immediately adjacent to the Bay, and that those wastes were released to the Bay. The Regional Board bases its findings in Section 9.10 of the DTR on two reports submitted by SDG&E's consultant, ENV America. In those reports, ENV America documents SDG&E's history of use of ponds located immediately adjacent to the Bay to dispose of wastewater composed of bilge water collected from the boiler side of the Silver Gate Power Plant. (ENV America, Site Assessment (July 14, 2004)(SAR193330-193523).) The Regional Board relies on ENV America's investigation in the areas of the former wastewater ponds, and finds that the proximity of soil contamination from the ponds to the Bay indicates the potential for discharges from the pond to contribute to pollution at the Shipyard Sediment Site. In addition, the Regional Board relies on a statement in SDG&E's July 14, 2004 response to the 13267 investigative order that stated that some water from a pond was discharged to the Bay. SDG&E's consultant's reports, in conjunction with other SDG&E documents, provide substantial, reasonable and credible evidence supporting the Regional Board's findings in Section 9.10.

1.Wastes Disposed of to the Wastewater Ponds Contained PCBs and Other COCs.

While SDG&E claims it "allegedly utilized" ponds at the Silver Gate Power Plant (Rescindment Request at 18:17), the evidence shows that SDG&E in fact disposed of liquid wastes to at least four separate unlined ponds and/or oil-water separators located on the SDG&E tidelands easement at different times from 1950 until 1974. (ENV America, Site Assessment (July 14, 2004)(SAR193330-193523).) In addition, SDG&E uses Cleanup Team testimony to claim that "BAE" operations on the SDG&E tidelands are responsible for the contamination of tidelands soil. (Rescindment Request at 24:17-26:5.) But, the Cleanup Team testimony cited does not support SDG&E's claim.

SDG&E alleges that Barker testified that he was unaware of aerial photographs depicting shipyard operations on the SDG&E tidelands, and that he agreed that the photos showed suspicious features that might be inconsistent with the allegations against SDG&E in Section 9.10. (Rescindment Request at 25:6-9.) Barker never testified that he was unaware of the aerial photographs. (Barker Depo., Vol IV at 715:6-742:9.) In addition, Barker never characterized anything in the aerial photos as "suspicious." (Id.) SDG&E also alleges that Carlisle "admitted that DTR Table 9-7 attributes the listed soil contaminants to former operations of SDG&E, and that he was unaware of SWM's operations on the parcel..." (Rescindment Request at 25:14-17.) Carlisle's cited testimony actually reveals that Carlisle knew that the SDG&E tidelands



were used by the shipyards, but did not know the timing of that use. (Carlisle Depo., Vol. II at 335:12-17.) SDG&E misstates the Cleanup Team's testimony to distract the Regional Board from the ample evidence that SDG&E is responsible for contaminating the tidelands soils, and the adjacent sediments through its disposal of untreated liquid wastes to ponds and oil/water separators.

Not only did SDG&E use multiple ponds from the 1940s to 1974, but it also consistently disposed of wastes containing PCBs and other COCs to those ponds and oil/water separators. Aerial photographs of the area leased by SDG&E on the tidelands demonstrate that SDG&E began disposing of wastes in ponds and oil/water separators in 1950 and continued this practice until at least 1974. (ENV America, Site Assessment (July 14, 2004) (SAR193330-193523).) SDG&E disposed of low volume wastes, which contained basement bilge water and water from the floor drain system at the Silver Gate Power Plant to the ponds and oil/water separators on the tidelands. (Exponent, Comments on Parties 13267 Responses (September 29, 2004)(SAR156880-156889).) The floor drains at the Silver Gate Power Plant were located in areas where large amounts of oil could be spilled. (Id.) Sampling by TN & Associates of sediments from the basement trench system, where low volume wastes were stored before being discharged to a pond or oil/water separator showed levels of PCB Aroclors 1254 and 1260, copper and mercury above reporting limits. (TN & Associates, Silver Gate Power Plant Basement Trench System Sediment Sampling (December 21, 2006).) The same PCB Aroclors, copper and mercury were found in soil samples in the areas of the former ponds and oil/water separators on the SDG&E tidelands.

The former location of SDG&E's ponds and oil/water separators were sampled by ENV America and Ninyo and Moore. In 2004, ENV America collected seven samples directly below or adjacent to the footprint of two of the former ponds. (ENV America, Site Assessment (July 14, 2004)(SAR193341).) Six of the samples were analyzed for PCBs, and two of those detected PCB Aroclors 1254 and 1260. (Id. (SAR193345).) In 2010, Ninyo and Moore collected 28 soil samples on the SDG&E tidelands. (Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (February 28, 2011).) Ninyo and Moore submitted a revised report dated May 24, 2011 to reflect amendments to its analytical laboratory results. (Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011).) Ninyo and Moore's revised results showed that PCBs were detected as Aroclor 1254 in six soil samples and as Aroclor 1260 in eight soil samples. (Id.) In addition, Ninyo and Moore's results showed that PCTs were detected as Aroclor 5460 in eight soil samples. (Id.) Ninyo and Moore also found copper and mercury above reporting limits in many of the samples. All of the samples that were located in the area where a former pond, "Pond B," was located contained PCB Aroclors 1254 and 1260, consistent with ENV America's sampling. In addition, the two Aroclors tend to co-occur in approximately the same concentrations in six out of the eight samples where both were detected. (See id.) The approximate ratio range of 1254 to 1260 is 0.9 to 1.1:1. (See id.) These two sets of sampling, along with the historical aerial photographs provide substantial, reasonable and credible evidence that SDG&E disposed of wastes containing PCBs, and other COCs from the Silver Gate Power Plant to the ponds and oil/water separators located immediately adjacent to the Bay {SDG&E claims that because "BAE" subleased the tidelands, it is the source of contamination to the sediments at and around Pier 1. (Rescindment Request at 24:17-28.) BAE Systems subleased a portion of the tidelands area from SDG&E for use as a parking lot. This area was never used for anything but employee parking. In addition, BAE Systems subleased an

area south of the SDG&E wastewater ponds and oil-water separators. This area was used for laydown and storage of materials, but like the parking lot, was paved.}

## 2. SDG&E's Wastewater Ponds Discharged Waste Directly to the Bay.

SDG&E claims that its consultant's response to the Regional Board's 13267 investigative order that "[s]ome water from the pond was discharged to the Bay" was "misplaced." SDG&E's revisionist claim ignores the ample evidence from the Administrative Record and SDG&E's own documents supporting SDG&E consultant's statement and showing there were multiple releases from the ponds and oil/water separators to the Bay covering a period of almost 25 years.

ENV America's July 14, 2004 Site Assessment Report includes internal SDG&E correspondence dated September 10, 1974 as an attachment. (ENV America, Site Assessment (July 14, 2004)(SAR193330-193523).) The correspondence discusses "Nobles Lake," an oil/water settling pond located on the tidelands that received waste from the turbine room and boiler room sump pumps. (Id.) The correspondence notes that Nobles Lake "is filled to the brim and is at least 11 feet deep with a mixture of oil and earth," and in its overflowing condition, "discharge from Silver Gate will eventually find a path to the San Diego Bay." (Id. (emphasis added).) Photographs of the SDG&E tidelands easement from the Silver Gate Power Plant to the Bay are evidence that Nobles Lake had been a liquid waste dumping ground for SDG&E since at least 1955, also 20 years before the September 1974 correspondence. It is also reasonable to conclude that September 10, 1974 was not the first time that SDG&E's use of Nobles Lake created an overflowing condition and eventual discharge path to the Bay. In fact, photographs of Nobles Lake from 1955, also included as attachments to the ENV America July 14, 2004 Site Assessment Report, show that Nobles Lake had become filled to the brim in the past, and that SDG&E's solution was to remove water and sludge and dump it onto the ground adjacent to Nobles Lake where it likely ran into the Bay or was washed into the Bay by storm water run off. (Id. (SAR193383).) Based upon these documents, it is SDG&E's characterization of its consultant's statements that seems misplaced.

Further, a May 1, 1950 letter from Walter Zitlau, an engineer at the Silver Gate Power Plant who later became President of SDG&E, states that the "water disposal lake on the tidelands has been overflowing, and a ditch has been cut to the water's edge," which would permit "oil [to] be admitted to the bay." (Letter from Walter Zitlau to M. Hjalmarson (May 1, 1950)(emphasis added).) The disposal pond referred to by Mr. Zitlau was located on SDG&E's tidelands easement, and was a different pond than Nobles Lake. Aerial photographs from 1950 clearly show the trench that Mr. Zitlau refers to in his letter extending from the pond all the way to the edge of the tidelands and into the Bay. (SAR193371.) Wastes were discharged from the pond to the trench and into the Bay likely from at least 1950 until 1952. (Aerial Photographs, SAR193338, SAR193375.) These documents provide substantial, reasonable and credible evidence that SDG&E discharged wastes containing PCBs and other COCs directly to the Bay.

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## 3. The Aroclor Signature in the Tidelands Soils is the Same as the Aroclor Signature Found in the Sediments North of Pier 1.

SDG&E claims that the PCB Aroclor signature found in the tidelands soils is substantially different than that of the sediment North of Pier 1. (Rescindment Request at 20:23-21:10.) In making this argument, SDG&E selectively relies on sediment sampling conducted by its

consultant, ENV America in 2004 {ENV America's sediment sampling report does not appear to be part of the Administrative Record. If it is not part of the Administrative Record, the Regional Board should disregard SDG&E's arguments that rely on it.}. (Id.) By doing so, SDG&E ignores the sediment sampling conducted by Exponent in 2001 and 2002, making their analysis incomplete. (Exponent, 2003 (SAR105417-105996).) The data from Exponent provides a true picture of the Aroclor signature North of Pier 1 because it captures a large number of samples over a large spatial area. (SAR105417-105996.)

The Exponent data set reveals higher concentrations of PCB Aroclors 1254, 1260, and PCT Aroclor 5460 in the sediment samples collected nearest to the shore of the tidelands leased by SDG&E. (Id.) This data strongly indicates a common source of the PCBs and PCT found North of Pier 1. The same Aroclors found in the sediments also were found in samples taken from the locations of SDG&E's former ponds on the tidelands by ENV America and, more recently by Ninyo and Moore. The Aroclors in samples from the cooling water tunnels and trenches of the Silver Gate Power Plant taken by TN & Associates and Ninyo and Moore also are consistent with the Aroclors found in the sediment samples North of Pier 1. (SAR193330-193464; Ninyo & Moore, Subsurface Investigation San Diego Gas & Electric Tidelands Area (May 24, 2011); TN & Associates, Silver Gate Power Plant Basement Trench System Sediment Sampling (December 21, 2006).) In addition, multiple sediment samples had ratios of Aroclor 1254 to 1260 in the same range as those found by Ninyo and Moore in the tidelands soils. (Exponent, 2003 (SAR105417-105996).) For example, the ratio of Aroclor 1254 to Aroclor 1260 for sediment samples SW01, SW02, SW03, SW05, and SW30, which are located approximately in front of the discharge cooling water tunnel, and cover an area extending at least 600 feet offshore and 400 feet along the SDG&E tidelands shoreline, varied from 0.7 to 1.3:1, which is substantially similar to the ratio range between 1254 and 1260 in upland soils of 0.9 to 1.1:1. (See id.) The Aroclor signature of the tidelands soil and adjacent sediment indicates that SDG&E's tidelands ponds and oil/water separators are a source of PCBs to Shipyard Sediment Site. Therefore, there is substantial, reasonable and credible evidence that SDG&E is the source of the PCBs and PCT found in sediments North of Pier 1.

**Comment ID:** 458

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS  
THE REGIONAL BOARD'S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

E.The Lower Concentrations of PCBs Found at the Silver Gate Power Plant and in Tidelands Soils are a Source of the Concentrations of PCBs in Bay Sediments.

SDG&E relies heavily throughout the Rescindment Request on its contention that the concentrations of PCBs and other COCs found in upland areas related to the Silver Gate Power Plant would need to be greater than the concentrations found in the sediments for SDG&E's Silver Gate Power Plant and operations to be a source of contamination to sediments in the

Shipyards Sediment Site. (Rescindment Request at 10:8-11, 12:4-12, 19:13-20:9.) SDG&E supports this contention with only its own speculation that lower concentrations in the soils cannot be the source of higher concentrations in the sediments. But, SDG&E does not consider credible, technical evidence that shows the differences in Aroclor concentrations and proportions between soils in the upland area and cooling water sediments and the Shipyards Sediment Site sediments are not inconsistent.

In fact, it is not reasonable to expect the two concentrations to be the same or to expect higher concentrations in upland sources. This is for the following two reasons: (1) the manner in which PCBs sorb to materials in sediments versus materials in upland sources; and, (2) the differences in times when PCBs were released compared with when those releases were measured.

First, the differences in PCB concentrations can be explained by the character of the sediment solids versus the upland solids where the PCBs are found. PCBs preferentially sorb to organic carbon in sediment. (Schorer, M., Pollutant and organic matter content in sediment particle size fractions, *Freshwater Contamination*. IAHS Pub. No. 243 (1997); Estes, T. J., Fractionation Study of Natural Sediments For Determining PAH and PCB Distribution in PAH and PCB Distribution in Sediment Fractions and Sorptive Phases (May 2005); Brannon, J.M., et al., Organic matter quality and partitioning of polychlorinated biphenyls (1997); Delle Site, A., Factors affecting sorption of organic compounds in natural sorbent/water systems and sorption coefficients for selected pollutants; a review, *J. Phys. Chem. Ref. Data* 30:187-439 (2001).) The sediments near the shipyards and the SDG&E tidelands are rich in organic carbon. (Exponent, 2003 (SAR105417-105996).) In addition, PCBs sorb to fine-grained particles, and the sediments in the Northern portion of the Shipyards Sediment Site have a high proportion of fine particles. (Schorer, M., Pollutant and organic matter content in sediment particle size fractions, *Freshwater Contamination*. IAHS Pub. No. 243 (1997); Exponent, 2003 (SAR105417-105996).) The particle size and composition of the tidelands soils and soils in the switchyard is likely to have a high proportion of coarser grained materials as a result of surface run-off, which carries finer particles with it. (Schorer, M., Pollutant and organic matter content in sediment particle size fractions, *Freshwater Contamination*. IAHS Pub. No. 243 (1997).) Because PCBs do not sorb to coarser grained soils found in upland areas as much as they do to fine particles found in sediment, one would expect to see lower concentrations of PCBs in the SDG&E upland sources of contamination, such as the tidelands and switchyard soil, than in the Shipyards Sediment Site sediments.

Moreover, PCBs may have been released at different times to the tidelands and switchyard soil than they were released from the sources to the sediments, and were measured at different times. The Silver Gate Power Plant operated for several decades, and releases to tidelands and switchyard soils likely occurred from approximately 1943 until the late 1990s. Most of the sediment data was collected by Exponent in 2001, 2002. (Exponent, 2003 (SAR105417-105996).) The soil data was collected in 2004 and 2010. This difference in measurement dates may impact the results of sampling as a result of PCB degradation. PCB degradation in soil is most likely to have occurred via volatilization, and PCB degradation in sediment is most likely to have occurred via reductive dechlorination. (Chiarenzelli et al., Volatile Loss of PCB Aroclors from Subaqueous Sand in *Environmental Science Technology* (1997); Van Dort et al., Reductive Ortho and Meta Dechlorination of a Polychlorinated Biphenyl Cogener by Anaerobic Microorganisms in *Applied Environmental Microbiology* (1991); T.S. Hurme and J.A. Puhakka, Characterization and Fate of Polychlorinated Biphenyl Contaminants in Kernaalanjarvi Sediments in *Boreal Environmental Resources* (1999).) These processes are likely to occur at

different rates. For example, the warm climate of San Diego likely would cause volatilization from soil to occur at the high end of the expected range.

As a result of these differences between the consistency of SDG&E tidelands and switchyard soils and the sediments, and of degradation rates in each medium, it is likely that there would be lower concentrations of PCBs in the SDG&E soils that are a source of contamination, and higher concentration of PCBs in the sediments that have been contaminated by SDG&E's releases.

**Comment ID:** 459

**Organization:** BAE Systems

**DTR Section:** 9

**Comment:**

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BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS

THE REGIONAL BOARD'S DESIGNATION OF SDG&E AS A DISCHARGER IS SUPPORTED BY SUBSTANTIAL, REASONABLE AND CREDIBLE EVIDENCE

F.SDG&E Inappropriately Contends That "BAE" is the Sole Cause of Impacts in the Northern Area of the Shipyard Sediment Site

SDG&E contends that "BAE" is the sole cause of impacts in the Northern area of the Shipyard Sediment Site, argues that the Regional Board should allocate 100 percent of the liability for the Northern portion of the Shipyard Sediment Site to "BAE," and asserts through its expert's technical comments that TBT should be a cleanup driver at the Shipyard Sediment Site. SDG&E uses Cleanup Team testimony to support these contentions, but misstates and mischaracterizes that testimony.

1.SDG&E's Assertions That "BAE" Was the Sole Source of Contamination to the Northern Portion of the Shipyard Sediment Site are Flawed and Not Supported by the Evidence

SDG&E mistakenly uses the term "BAE" to refer to multiple different shipyards that operated on the Northern portion of the Shipyard Sediment Site from 1914 until the present, and attributes sole responsibility for contamination to "BAE," rather than distinguishing between the various shipyard entities. This is a critical conflation as BAE Systems only operated a shipyard on the Northern portion of the Shipyard Sediment Site from 1979 to the present {EPA banned the manufacture of PCBs in 1979. (EPA Press Release, EPA Bans PCB Manufacture; Phases Out Uses (April 19, 1979).)}. Many of the examples SDG&E relies on to argue that "BAE" contributed to contamination at the Northern portion of the Shipyard Sediment Site are examples of equipment used or activities of the historical shipyards unrelated to BAE Systems that operated before 1979. For example, SDG&E points to Sanborn maps from 1954 to 1959 that indicate the presence of a shipyard electric transformer approximately 20 feet from the San Diego Bay. (Rescindment Request at 12:18-20.) That transformer belonged to a prior shipyard operator. In addition, SDG&E claims "BAE" engaged in extensive shipyard maintenance, retrofitting, sandblasting and other activities on the tidelands leased by SDG&E from the 1950s until the early 1970s. (Rescindment Request at 24:17-28.) Again, SDG&E attributes to BAE

Systems operations that were conducted by prior shipyards that have no relationship to BAE Systems.

SDG&E declares that “BAE’s” operations are the sole source of contamination at the Northern portion of the Shipyard Sediment Site. But, BAE’s operations could not be the sole source of contamination to the Northern portion of the Shipyard Sediment Site. BAE Systems never used products containing PCBs, or released any PCBs to the Shipyard Sediment Site. BAE Systems has tested all oil containing devices at the shipyard for PCBs. And, contrary to SDG&E’s characterizations, BAE Systems has only one transformer containing 12 parts per million PCBs located at the southern end of the BAE Systems leasehold. And, there is no evidence that this transformer ever leaked. In addition, BAE Systems has continually improved its environmental systems since it began operating in 1979, and has eliminated storm water discharges since 2000. Any discharge of PCBs from the BAE Systems leasehold would have been from historical shipyard operations, or as a result of urban run-off. And, in overreaching to support its conclusion SDG&E ignores the substantial, reasonable and credible evidence of its own discharges of PCBs and other COCs to the Bay. Despite SDG&E’s assertions, it would be impossible for BAE Systems to have been the sole source of contamination at the Northern portion of the Shipyard Sediment Site.

## 2.SDG&E’s Argument That the Regional Board Should Allocate 100 Percent of Liability to “BAE” is Legally Improper

SDG&E errs in its Rescindment Request by arguing that the Regional Board should allocate 100 percent of the liability for the contamination in the Northern portion of the Shipyard Sediment Site to “BAE.” As the Regional Board is aware, BAE Systems, SDG&E, and others are parties to a pending CERCLA action known as City of San Diego v. National Steel and Shipbuilding Company, et al. United States District Court, Southern District, Case number 09-02275-DMS (BGS) (the “District Court Action”). “It is not appropriate for the Regional Board or State Board to involve itself in deciding issues of allocation of responsibility between different parties to a cleanup.” (In re San Diego Unified Port District, Water Quality Order No. 89-12.) SDG&E’s Rescindment Request should be denied because it is improper for the Regional Board to allocate responsibility between the parties to the TCAO.

## 3.SDG&E Grossly Misstates the Cleanup Team’s Testimony in Arguing That “BAE” Should be Solely Liable

Throughout SDG&E’s Rescindment Request, SDG&E relies on testimony from the Regional Board Cleanup Team to support its arguments that “BAE” is the sole cause of contamination to the Northern portion of the Shipyard Sediment Site. However, in many instances, SDG&E misstates and mischaracterizes the Cleanup Team’s testimony. And, SDG&E’s misstatements are likely to be misleading to the Regional Board, and, thus, should be disregarded. SDG&E also ignores the numerous objections made by counsel in excerpting selected portions of deposition testimony. The Regional Board should review the actual transcript in evaluating the evidence supporting its findings. Further, while there are numerous instances in which SDG&E misstates or mischaracterizes Cleanup Team deposition testimony, BAE only provides two such examples herein.}

For example, SDG&E cites Craig Carlisle’s (“Carlisle”) testimony in arguing that the “Regional Board staff ignored sediment investigations ... which reported ... data establishing the co-occurrence or co-location of contaminant impacts that the shipyards are known to be the sole source of – such as tributyltin (“TBT”) – with other COCs.” (Rescindment Request at 28:9-11, 23-25.) But, Carlisle’s testimony actually states that co-location “has a lot of pitfalls associated with it,” and is used “to draw certain conclusions about ... allocation ....” (Carlisle Depo., Vol. II at 325:19-25.) Carlisle concludes that co-location “wasn’t a line of investigation that we thought was necessary to support the allegations.” (Id.)

In addition, SDG&E cites David Barker’s (“Barker”) testimony in claiming that “Regional Board staff ignored decades of sediment monitoring reports establishing the extent of SWM’s impacts to the Shipyard Sediment Site sediments, including multiple investigations in and near Pier 1 marine railways, as well as numerous investigations in San Diego Bay sediment.” (Rescindment Request at 27:14-17.) In fact, Barker testified that two decades worth of sediment monitoring reports were “the primary source of information that the [Regional Board] relied upon ... as the basis for the [Regional Board’s] conclusion that there were elevated contaminant levels offshore of NASSCO and Southwest.” (Barker Depo., Vol. III at 655:17-656:5.) And, Barker only acknowledged that the Regional Board did not contact Ogden personnel regarding their direct observations of the condition of the sediments at the marine railways. (Barker Depo., Vol. III at 644:24-645:8.) Nowhere did Barker state that the Regional Board staff ignored decades of sediment monitoring reports, as SDG&E claims. SDG&E’s mischaracterization of the Cleanup Team’s testimony provides another reason for denying SDG&E’s Rescindment Request.

#### 4. SDG&E’s Argument That TBT Should be a Cleanup Driver is Baseless

SDG&E, through its expert, ENVIRON, submitted technical comments to the TCAO (“Technical Comments”). These Technical Comments should be excluded, and any arguments made by SDG&E that rely on them should be disregarded {BAE has filed herewith a separate Motion to Exclude the Technical Comments.}. In the Technical Comments, SDG&E asserts that tributyltin (“TBT”) should be a cleanup driver under the TCAO. But, there is no evidence to support this argument, and neither SDG&E nor ENVIRON offer anything other than their improper opinions. And, a determination by the Regional Board that TBT is or is not a cleanup driver is neither necessary nor proper to a determination that SDG&E is a discharger at the Shipyard Sediment Site and properly named in the TCAO.

Further, the TCAO acknowledges that different COCs present different risks depending upon the receptors. For example, Paragraph 30 of the TCAO identifies PCBs, copper, and mercury as presenting a human health risk. And, Paragraph 26 of the TCAO identifies PCBs, copper, mercury and high molecular weight polynuclear aromatic hydrocarbons as presenting a risk to aquatic-dependent wildlife. Nowhere does the TCAO identify TBT as a risk driver for human health risk, aquatic-dependent wildlife risk or aquatic life. As a result, SDG&E’s assertion in the Technical Comments that TBT should be a cleanup driver is incorrect and otherwise irrelevant to a finding that SDG&E is a discharger.

**Comment ID:** 460  
**DTR Section:** 9

**Organization:** BAE Systems

**Comment:**

**BAE SYSTEMS SAN DIEGO SHIP REPAIR INC.'S RESPONSE TO SAN DIEGO GAS & ELECTRIC COMPANY'S REQUEST FOR RESCINDMENT OF DISCHARGER DESIGNATION AND COMMENTS**

IV. CONCLUSION

The Regional Board's designation of SDG&E as a discharger in the TCAO, and its findings in Section 9 of the DTR are supported by substantial, reasonable and credible evidence from the Administrative Record, deposition testimony of the Cleanup Team, data and by documents prepared by SDG&E and its own consultants. Additional documents submitted with BAE System's Response to SDG&E Rescindment Request bolster the evidence supporting the Regional Board's finding that SDG&E is a discharger to the Shipyard Sediment Site. These include additional documents either produced by SDG&E in the District Court Action, power plant industry documents and technical reference documents from the United States Environmental Protection Agency, and other scientific journals or documents otherwise publicly available. As a result, SDG&E was properly designated a discharger under California Water Code section 13304.

For all of the foregoing reasons set forth in this Response, BAE Systems requests that the Regional Board deny SDG&E's Rescindment Request.

**Comment ID:** 461

**Organization:** Coastkeeper and EHC

**DTR Section:** 18, 19

**Comment:**

I. The DTR Sufficiently Addressed Bioavailability of Pollutants at the Shipyard Sediment Site.

A. The DTR's approach to assessing aquatic life impairment is sufficient, despite to BAE's complaints to the contrary.

The DTR's approach to assessing aquatic-life impairment at the Site is sufficient. See Expert Report of Donald MacDonald, prepared March 11, 2011, §C.3.2 at 15 ("Evaluating risks to human health and aquatic-dependent wildlife using SWACs of contaminants in sediment is a scientifically valid approach that has been used in other sediment remediation projects."). The DTR's approach is similar to and in line with the approach used for the State of California's Sediment Quality Objectives (SQO's). See Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1. Sediment Quality, State Water Resources Control Board, 2009. In fact, as part of the DTR, twenty seven of the Triad stations were re-analyzed using the sediment quality objective framework and little difference in outcomes was found. See DTR Volume 2, Table 32-17 and App. 32. This demonstrates that while the DTR may have relied on a modified Weight-of-Evidence approach, its outcomes are in line with state approved guidance.

Some Designated Parties criticize the DTR for not relying on the bioavailability of chemicals at the site to assess aquatic life impairment. Bioavailability is often assessed via modeling of the ratio of the acid-volatile sulfide content of sediment versus the simultaneously extracted metal concentration (AVS-SEM). While the Exponent Report does contain AVS-SEM data, other external experts in sediment chemistry and assessment have determined that this data is "largely



unusable.” See Letter from Russell Fairey to San Diego Regional Water Quality Control Board dated June 17, 2002 SAR 065523. While bioavailability is one of many possible and useful tools used to ascertain risk to aquatic organisms, it is not the only tool. In fact, the state-approved guidelines for assessing sediments do not rely on determining bioavailability with modeling approaches like the AVS-SEM approach. See Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1. Sediment Quality, State Water Resources Control Board, 2009.

More importantly, Regional Board staff elected to rely on evidence of bioaccumulation in *Macoma nasuta*, a standard test organism used to evaluate whether chemicals in sediments can be taken up by organisms. In other words, staff chose a direct measurement of bioavailability – the extent to which a living organism accumulates chemicals in their tissues – as opposed to a model (AVS-SEM) to evaluate bioavailability. Dr. Allen, in his expert report for NASSCO, notes that in the Tentative Clean Up and Abatement Order “it is correctly noted that concentrations of arsenic, copper, lead, mercury, zinc, TBT, total PCBs, and high molecular weight PAHs in the *Macoma nasuta* [sic] tissues increase with respect to their concentrations in the sediment.” Expert Report of Herbert Allen, prepared for NASSCO, dated March 11, 2011 at 19 (emphasis added). Expert Donald MacDonald also affirms that “the results for the Shipyard Sediment Site confirm that the COCs are biologically available because they accumulated in the tissues of the clam, *Macoma nasuta*.” See Declaration of Donald MacDonald at ¶ 14. Thus, two sediment assessment experts agree that chemicals in sediments at the Shipyard Site can accumulate in tissues of organisms.

**Comment ID:** 462

**Organization:** Coastkeeper and EHC

**DTR Section:** 19

**Comment:**

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The DTR Sufficiently Addressed Bioavailability of Pollutants at the Shipyard Sediment Site.

B.The DTR correctly interpreted the bioaccumulation data.

Both BAE and NASSCO criticize the DTR’s use of the *Macoma* bioaccumulation data as “contrary” to San Diego Bay’s narrative water quality objective for toxicity. This argument is unconvincing, irrelevant, and weak for several reasons. See Declaration of Donald MacDonald at ¶ 15. First, the DTR and Order address the narrative water quality objective through the evaluation of multiple lines of evidence. The *Macoma* data demonstrates that potentially harmful chemicals in the sediments at the Shipyard Site are in a form that can accumulate in tissues of organisms. See DTR Finding 19. This critical information supplements the assessments done to measure compliance with the narrative toxicity water quality standard—it is not “contrary” to it. Further, a sediment quality assessment need not be limited to collecting the information that is required to support evaluation of attainment of the water quality objectives. See Declaration of Donald MacDonald at ¶ 15.

**Comment ID:** 463

**Organization:** Coastkeeper and EHC

**DTR Section:** 18, 19

**Comment:**

The DTR Sufficiently Addressed Bioavailability of Pollutants at the Shipyard Sediment Site.

C.Dr. Allen’s opinions on bioaccumulation and bioavailability are weak and contain numerous flaws.

BAE relies on Dr. Allen’s opinions with respect to bioaccumulation and bioavailability to criticize the DTR’s approach. See BAE Comments dated May 26, 2011 at 7. However, the evaluation provided by Dr. Allen is weak and contains numerous flaws, as outlined by Donald MacDonald in his June 23, 2011 declaration. See Declaration of Donald MacDonald at ¶ 9.

For example, Dr. Allen has reached incorrect conclusions regarding the interpretation of AVS-SEM data. Using EPA guidance for AVS-SEM criteria as a his basis, Mr. MacDonald notes that “21 of 24 samples from the NASSCO site and 21 of 29 samples from the Southwest Marine Site would be classified as possibly having adverse biological effects due to divalent metals.” See Declaration of Donald MacDonald at ¶ 9.

Similarly, Dr. Allen inappropriately applied the Biotic Ligand Model. The EPA has not developed and approved a Biotic Ligand Model for the assessment of sediments. See Declaration of Donald MacDonald at ¶ 9. Currently, the EPA only recommends that the Biotic Ligand Model be used to develop copper criteria for freshwater systems. See Declaration of Donald MacDonald at ¶ 9. Although Dr. Allen referred to a paper published by Di Toro et al. (2005) for the methods that he used to predict sediment metal toxicity using a sediment Biotic Ligand Model, the method has never been endorsed by EPA and the Di Toro et al. (2005) Biotic Ligand Model did not include mercury. See Declaration of Donald MacDonald at ¶ 9.

**Comment ID:** 464

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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II.Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

A.The contaminants at the Site are not readily degraded and, hence, are likely to persist in sediments well into the future.

The contaminants of concern at the Site are not readily amenable to natural attenuation processes. See Declaration of Donald MacDonald at ¶ 6. The U.S. Environmental Protection Agency indicates that the contaminants that are most appropriate for monitored natural attenuation include petroleum-related contaminants (i.e., benzene, toluene, ethylbenzene, and xylene), chlorinated solvents (e.g., trichloroethane), or inorganics that undergo sorption or oxidation-reduction reactions (e.g., certain metals and radionuclides). See EPA, “Use of

monitored natural attenuation at Superfund, RCRA corrective action, and underground storage tank sites.” (1999) Directive 9200.4-17P. Office of Solid Waste and Emergency Response. Washington, D.C. 32 pp (hereafter “EPA (1999)”) See also Declaration of Donald MacDonald at ¶ 5.

By comparison, the contaminants of concern at the Site include organic contaminants that are not readily degraded, such as PAHs, PCBs, and TBT. See Tentative Cleanup and Abatement Order 2011-001 ¶ 29, Table 1, page 13. Furthermore, the metals at the Site are not degradable, have already been subject to sorption processes, and are known to be bioavailable under current conditions. See Declaration of Donald MacDonald at ¶ 6. Passage of time is unlikely to render these contaminants less biologically available. See Declaration of Donald MacDonald at ¶ 6. Therefore, monitored natural attenuation is unlikely to be effective on these contaminants of concern.

**Comment ID:** 465

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

B. The pollutants at the Site have the potential to migrate off site due to the nature of the activities at the Site.

Monitored natural attenuation is not appropriate for use at sites where contaminants have the potential to migrate to other areas. See EPA (1999); See Declaration of Donald MacDonald at ¶ 5. Neither NASSCO nor BAE have provided evidence to demonstrate that contaminants of concern at the Site are stable under the range of conditions that occur at the site. On the contrary, activities at the site, such as ship maintenance and repair (and associated prop wash), have the potential to remobilize sediment-associated pollutants and result in off-site transport. See Declaration of Donald MacDonald at ¶ 6. Likewise, storms and tidal current could exacerbate off-site contaminant transport at the Site. See Declaration of Donald MacDonald at ¶ 6.

**Comment ID:** 466

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

C.No reliable data have been presented in the public record that demonstrate that natural attenuation is occurring at the Site.

There is no evidence in the public record that pollutant concentrations are decreasing at the site. See Declaration of Donald MacDonald at ¶ 6. Sediment chemistry data collected in 2001 and 2002 demonstrate that elevated concentrations of contaminants of concern occur throughout much of the site and that these contaminants pose unacceptable risks to human health and the environment. See DTR Volume 2.

NASSCO and BAE argue that sediment chemistry data collected at five locations in 2009 provide the necessary and sufficient evidence to demonstrate that contaminant concentrations are decreasing at the site. See NASSCO Comments submitted May 26, 2011 at 40; BAE Comments submitted May 26, 2011 at 26. However, five samples do not provide a data set that is sufficiently robust to characterize current contaminant concentrations at the Site. See Declaration of Donald MacDonald at ¶ 6.

In addition, neither NASSCO nor BAE presented evidence demonstrating that variability in contaminant concentrations is not due to sampling issues such as sampling location, sampling depth, analytical methods, or other factors. See Declaration of Donald MacDonald at ¶ 6. References to data collected by AMEC in 2010 are not relevant because that data is not yet a part of the administrative record. See BAE Comments at 26, fn 8. The Regional Board may not consider this data because San Diego Coastkeeper and Environmental Health Coalition were not provided with this data and given a full and fair opportunity to review and vet that data prior to the close of the comment and rebuttal period.

**Comment ID:** 467

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

D.No evidence demonstrates that monitored natural attenuation would reduce pollutant concentrations to levels that would protect human health and the environment within a reasonable time frame.

Sediment chemistry data alone do not provide a basis for demonstrating that risks to benthic invertebrates or fish would be adequately reduced by natural attenuation. See Declaration of Donald MacDonald at ¶ 6. This means that even if valid sediment chemistry data existed showing reduced pollutant concentrations since 2001, such data would not be sufficient to demonstrate that monitored natural attenuation would be appropriately protective of human health and the environment. See Declaration of Donald MacDonald at ¶ 6. Pore-water chemistry, whole-sediment toxicity, invertebrate-tissue chemistry, and fish-tissue chemistry would also be required to demonstrate that natural attenuation is reducing exposure of ecological receptors to contaminants at the Site See Declaration of Donald MacDonald at ¶ 6. Neither NASSCO nor BAE has submitted data to support their claim that monitored natural attenuation would be protective of human health and the environment. See Declaration of Donald MacDonald at ¶ 6.

Evaluation of the available data and information indicates that conditions at the Site are sufficient to injure surface water resources (i.e., sediments) and biological resources (i.e., benthic invertebrate, fish, and wildlife communities). See Declaration of Donald MacDonald at ¶ 6; See generally DTR Volume 2. Neither NASSCO nor BAE presented evidence to demonstrate that such natural resource injuries would abate within a reasonable time frame if monitored natural attenuation was selected as the preferred remedy. On the contrary, selecting monitored natural attenuation as the preferred sediment management option will likely result in such natural resource injuries continuing well into the future. See Declaration of Donald MacDonald at ¶ 6. Any such impacts on natural resources would likely result in continuing beneficial use impairments in San Diego Bay. See Declaration of Donald MacDonald at ¶ 6.

**Comment ID:** 468

**Organization:** Coastkeeper and EHC

**DTR Section:** 33

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

E.Site security will not prevent benthic invertebrates, fish, or wildlife from being exposed to contaminants remaining at the Site.

Even if the Site will remain as a secured shipyard until at least 2040, security measures will not prevent humans and wildlife from being exposed to pollutants from the Site. While security measures may limit human exposure to the pollutants at the Site, they will not prevent wildlife exposure to the contaminants that occur at the Site. See Declaration of Donald MacDonald at ¶ 6. Securing the Site does not prevent fish or other aquatic life from swimming in and out of

the site, nor does it prevent people or wildlife from catching and consuming wildlife exposed to contaminants at the Site. Therefore, people are still at risk of being exposed to pollutants remaining at the Site despite security measures at the Site.

**Comment ID:** 469

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

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Evaluation of the available data and information indicates that conditions at the Site are sufficient to injure surface water resources (i.e., sediments) and biological resources (i.e., benthic invertebrate, fish, and wildlife communities). See Declaration of Donald MacDonald at ¶ 6; See generally DTR Volume 2. Neither NASSCO nor BAE presented evidence to demonstrate that such natural resource injuries would abate within a reasonable time frame if monitored natural attenuation was selected as the preferred remedy. On the contrary, selecting monitored natural attenuation as the preferred sediment management option will likely result in such natural resource injuries continuing well into the future. See Declaration of Donald MacDonald at ¶ 6. Any such impacts on natural resources would likely result in continuing beneficial use impairments in San Diego Bay. See Declaration of Donald MacDonald at ¶ 6.

**Comment ID:** 470

**Organization:** Coastkeeper and EHC

**DTR Section:** 30.1.1

**Comment:**

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Natural Attenuation is Not a Viable Remedy for Addressing Issues Related to Sediment Contamination at the Site.

NASSCO and BAE have both identified “Monitored Natural Attenuation” as their preferred remedy for the Shipyard Sediment Site in San Diego Bay. However, natural attenuation is not a viable option to address contaminated sediment issues at the Shipyard Sediment Site for several reasons.

G. Monitored natural attenuation cannot be considered the preferred remedial option because NASSCO and BAE have failed to prove that monitored natural attenuation would protect human health and the environment and achieve remedial objectives within a reasonable time frame.

EPA’s guidance regarding appropriate use of monitored natural attenuation as a remediation strategy emphasizes that the proponent must present convincing site-specific technical evidence that monitored natural attenuation will effectively protect human health and the environment, and that the remedial objectives will be achieved within a reasonable time frame. See EPA (1999); See Declaration of Donald MacDonald at ¶ 5. This presumption against monitored natural attenuation means that the burden of proof that monitored natural attenuation will be effective is on NASSCO and BAE. But neither NASSCO nor BAE has proven, with evidence in the record provided to all Designated Parties, that monitored natural attenuation will protect human health and the environment and achieve the remedial objectives within a reasonable time frame. For this reason, the Regional Board cannot select monitored natural attenuation as the preferred remedial alternative. See Declaration of Donald MacDonald at ¶ 6.

**Comment ID:** 471

**Organization:** Coastkeeper and EHC

**DTR Section:** 33

**Comment:**

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III. BAE’s Criticisms of Don MacDonald’s Expert Report Are Not Based on Expert Testimony and are Without Merit.

BAE’s lawyers found fault with every point Don MacDonald made in his expert report, dated March 11, 2011 and deemed each expert opinion “incorrect,” “invalid,” “unsupported” or “premature.” However, BAE’s criticisms are solely argument, as they rely on unsupported assertions made by lawyers, not on measured points provided by an equally-qualified expert. After examining the particular criticisms, it is clear that they are without merit and provided merely in an attempt to confuse the Regional Board. For these reasons, BAE’s criticisms of Donald MacDonald’s expert opinions carry little weight and should be ignored. All of BAE’s arguments attacking Mr. MacDonald’s opinions and conclusions are without merit. Below are three examples of the meritless, unsupported, and nonsensical arguments raised by BAE’s lawyers.

1. BAE's lawyers claim that Mr. MacDonald's expert opinion that "the sampling density is insufficient to accurately characterize the nature and extent of contamination at the site" is "incorrect." They base this claim on an unsupported and un-cited assertion that sampling was "consistent with the manner in which most schemes are designed at contaminated sites." BAE Comments at 30. But BAE's lawyers provide no citations or examples to demonstrate that "most schemes" are designed with such a paltry sampling density, nor can they explain how an opinion about a subjective matter like "sufficiency" can be "incorrect."

2. BAE's lawyers characterize Mr. MacDonald's conclusion that the proposed remedial footprint "excludes polygons with composite SWAC ranking values greater than 5.5" as "invalid." See BAE Comments dated May 26, 2011 at 54. But the record clearly shows that the lowest SWAC ranking value included in the footprint was 5.5 and that 15 polygons with SWAC ranking values greater than 5.5 were not included in the footprint. See DTR Tables A33-1 and A33-2. That BAE's lawyers characterize an accurate factual summary as an "invalid" conclusion reveals their argument as nonsensical and unconvincing.

3. BAE's lawyers claim that Mr. MacDonald provided "no technical basis" for his assertion that the proposed remedial footprint "excludes polygons, like NA07, with concentrations of contaminants in sediment that likely pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the proposed remedial footprint." See BAE Comments dated May 26, 2011 at 54. BAE either ignores or fails to understand that Table 1 of Mr. MacDonald's expert report sets forth the technical basis for his conclusion that the proposed remedial footprint exclude polygons that pose higher risks to human health and aquatic-dependent wildlife than some of the polygons included in the proposed remedial footprint. See Expert Report of Donald MacDonald dated March 11, 2011 at Table 1.

It is clear that BAE's lawyers' arguments attacking every single opinion and conclusion Donald MacDonald offers in his expert report is a thinly-veiled attempt to force the Environmental Parties to spend their limited resources in responding to ridiculous and meritless argument. For this reason, the Environmental Parties will only provide three examples demonstrating the nonsensical, meritless nature of BAE's arguments attacking Mr. MacDonald. However, every single one of BAE's attacks on Mr. MacDonald is without merit. BAE's lawyers unfounded and unsupported arguments attacking Mr. MacDonald's credible expert report and his opinions contained in it are meritless and should be ignored.

**Comment ID:** 472  
**DTR Section:** 18.2

**Organization:** SDG&E

**Comment:**

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1.2 Triad Approach Flawed As it Lacks Scientifically Valid Consideration of COCs

The sediment chemistry line of evidence used in the CRWQCB (2010) Triad approach is critically flawed and is not valid to characterize risk potential to aquatic life. The approach relies on the SQGQ1 metric, as shown in Figure 18-1 of CRWQCB (2010). A primary flaw in this approach is that TBT is not considered by the SQGQ1 metric, despite the fact that TBT was selected by CRWQCB (2010) as a primary Site COC. TBT, an anti-fouling agent historically



used on marine vessels and a known waste product of the shipyards industry, has been referred to as “the most toxic compound ever released into the environment” (Meador, 2010) and is a prevalent at many contaminated shipyard sediment sites undergoing investigation and remediation (USEPA, 1996; EVS, 1999; Antizar-Ladislao, 2008; Chen, 2010).

TBT is toxic to aquatic invertebrate life, with effects noted in water at concentrations of 0.07 to 0.007 micrograms per liter ( $\mu\text{g/L}$ ) and in sediment at concentrations less than 100 micrograms per kilogram ( $\mu\text{g/kg}$ ) (Meador et al., 2002; Meador, 2011).

A second critical flaw in the CRWQCB (2010) Triad sediment chemistry line of evidence approach concerns the nature of the sediment quality guidelines (SQGs) used in the SQGQ1 metric. The SQGs used in the SQGQ1 approach are referred to as “empirical” SQGs because they are derived from studies that have measured concentrations of chemicals and laboratory toxicity in field-collected sediments

containing a variety of chemicals and exhibiting a variety of physical properties. As these sediments contain a wide variety of unmeasured and measured physical and chemical properties that may adversely affect the laboratory toxicity test organisms, it is impossible from that approach alone to know which chemical, group of chemicals, or physical condition may be responsible for the presence of adverse effects (Batley et al., 2005). This leads to an absence of causality between concentrations of individual chemicals and adverse effects such that the SQGs are not useful in predicting toxicity from individual chemicals.

**Comment ID:** 473

**Organization:** SDG&E

**DTR Section:** 32.5.2

**Comment:**

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1.5 Conclusion

Although it is not recommended to fully characterize risk potential and/or designate remedial action to address benthic impacts by using sediment chemistry alone (e.g., for the Non-Triad Data Approach stations), the Toxic Unit approach detailed in Conder (2011a) is considered to be a more scientifically defensible sediment chemistry-only approach compared to the SS-MEQ and 60% LAET evaluation. It also includes all five relevant primary Site COCs, in contrast to the Triad sediment chemistry line of evidence, which omits TBT. The Toxic Unit approach should be adopted for use in sediment chemistry line of evidence approaches for the CRWQCB (2010) Triad and Non-Triad Data approaches, and thus should be used for deriving a remedial footprint in conjunction with other considerations regarding technical and economic feasibility in a manner consistent with the approaches discussed in CRWQCB (2010).

**Comment ID:** 474

**Organization:** NASSCO

**DTR Section:** 17

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

2. There is No Significant Risk To Aquatic Life (Findings 14 – 20)

a. Shipyard Chemicals And Other Pollutants Are Present In The Sediment, But Do Not Pose Risks To Aquatic Life (Findings 15 - 19)

(1) The TCAO Overstates The Sediment Chemistry Prong Of The Triad Analysis (Findings 15-20)

The TCAO overstates the sediment chemistry prong of the triad analysis both because (1) differences in sediment grain size and total organic carbon between the reference pool and shipyard sediments, which are unrelated to shipyard discharges, skew the results in favor of finding higher sediment chemistry at NASSCO, and because (2) Staff's MLOE decision framework is driven primarily by sediment chemistry, even though most experts place greater weight on biological lines of evidence, particularly benthic community analysis. Ginn Report, at 14, 17-19. [Comment No. 39, TCAO, at 15-20, DTR, at 15-20, Appendix 15, Appendix 18, Appendix 19].

(a) The Reference Pool Does Not Accurately Reflect Chemical And Biological Conditions At NASSCO In The Absence Of Site-Related Discharges (Findings 17, 29)

Sediment chemistry results at NASSCO are overstated because the reference pool does not accurately represent the chemical and biological conditions at the shipyards in the absence of site-related discharges. See Ginn Report, at 17-18. This is because reference stations (1) contain coarser sediments, (2) more organic carbon, and (3) tend to be located far from the shoreline (and associated generalized sources of contaminants). *Id.* [Comment No. 40, TCAO, at 17, DTR, at 17.1-17.2].

Criteria for selecting acceptable reference stations include, among other things, “sediment total organic carbon (TOC) and grain size profiles similar to the Shipyard Sediment Site.” TCAO, at ¶ 17. This is because sediment chemistry can be affected by both grain size and TOC, due to the chemical behavior of metals. For example, grain size can affect sediment chemistry because metals have a greater affinity to fine sediments than to coarse sediments. Deposition of Tom Alo (“Alo Depo”), at 183:22 – 184:6, 184:13 – 185:15. [Comment No. 41, TCAO, at 17, 29 DTR, at 29.1-29.3]. Accordingly, all else being equal, sediments with a higher proportion of fines will typically display higher concentrations of metals than sediments composed of coarse materials—purely as a result of grain size. *Id.* [Comment No. 42, TCAO, at 17, 29, DTR, at 29.1-29.3]. Differences in grain size can also have a similar effect on benthic community composition and toxicity results, with sediments composed largely of fine particles showing a greater likelihood of apparent toxicity based solely on the size of the particles. *Id.* [Comment No. 43, TCAO, at 17, 29, DTR, at 29.1-29.3]. Similarly, certain chemicals, including PCBs, have a high affinity for TOC. *Id.*, at 193:20 – 194:2, 194:12 – 195:3, 196:14 – 196:25. [Comment No. 44, TCAO, at 17, 29, DTR, at 17, 29]. As a result, assuming there is equal PCB contamination throughout the Bay, one would expect to see higher PCB concentrations in sediments containing higher

percentages of organic carbon—purely as a result of differences in TOC content. Id. [Comment No. 45, TCAO, at 17, DTR, at 17, 29]. Here, the reference pool stations selected by Staff contained higher percentages of coarse sediments and TOC than the triad stations sampled at NASSCO. [Comment No. 46, TCAO, at 17, DTR, at 17, 29]. Accordingly, some of the apparent effects detected at NASSCO likely are attributable to the fact that there are higher percentages of fine particles and organic carbon at NASSCO relative to sediments at the selected reference pool, rather than to shipyard discharges. Id. at 191:6 – 191:12, 203:23 – 204:1. [Comment No. 47, TCAO, at 17, 29, DTR, at 17, 29].

Additionally, sediment pollutant concentrations generally increase closer to shore due to the presence of point source outfalls; accordingly, one would expect the concentration of contaminants of concern to be higher in sediment near-shore than further offshore, even in the absence of shipyard discharges. Alo Depo, at 181:11 – 182:24. [Comment No. 48, TCAO, at 17, DTR, at 17.1-17.2].

For these reasons, some of the elevated chemistry and apparent effects detected in toxicity tests and benthic community analyses likely are attributable to differences between reference and shipyard sediments that are unrelated to shipyard discharges. Ginn Report, at 17. [Comment No. 49, TCAO, at 17, DTR, at 17.1-17.2]. The TCAO is therefore overly conservative in assuming that all observed differences from reference result from shipyard discharges. [Comment No. 50, TCAO, at 17, DTR, at 17.1-17.2].

**Comment ID:** 475

**Organization:** City of San Diego

**DTR Section:** 4.7.1.2

**Comment:**

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D.THE EVIDENCE DOES NOT SUPPORT THE CONCLUSION THAT “REMEDICATION GOALS CANNOT BE MET DUE TO RE-CONTAMINATION FROM OTHER SOURCES.”

In its comments submitted on May 26, 2011, NASSCO argues that “Remediation Goals Cannot Be Met Due to Re-Contamination From Other Sources {NASSCO's Comments, p. 38-39}.” The City is committed to complying with the Chollas Creek metals TMDL. While actions are not required prior to 2018, 80% reduction is required by 2018. The City has analyzed and evaluated different means of achieving compliance and is currently developing a plan that the City believes should achieve compliance. There are numerous technologies more effective (and not more costly) than sand filters at removing metals, including dissolve fractions, that are being considered for implementation throughout the Chollas Creek watershed.

As noted in responses to comments above, the discharges from Chollas Creek do not significantly affect inner Shipyard sediments. Predictions of mass discharges from Chollas Creek of copper, zinc, and lead as the TMDL is being implemented suggest that there will be no measureable increase in sediment concentrations of these constituents after remediation of Shipyards is complete. Accordingly, there should be no concerns that remediation goals cannot be met because of any concerns regarding recontamination from Chollas Creek.

**Comment ID:** 476

**Organization:** Port District

**DTR Section:** 1.4.2.1. and 1.5.2.

**Comment:**

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Port Support of the Proposed Remedial Footprint

TCAO Finding 33 and Attachment 2  
DTR §§1.2; 1.4.2.1, and 1.5.2

Additionally, the Port's experts agree that the remedial footprint can go forward without delay. While some parties may claim that the remediation cannot go forward unless the Chollas Creek outfall area is included within the remedial footprint or otherwise addressed because of recontamination concerns, the Port's designated fate and transport expert has concluded that any interim resedimentation from Chollas Creek discharges will not adversely impact the remediation efforts at the Shipyards. (Exhibit "2" [Port Expert Designation]; Exhibit "4" [Dr.Poon Declaration], paragraphs [13-15.]) As such, the Port supports the exclusion of the mouth of Chollas Creek from the remedial footprint as well as the decision to move forward expeditiously with the remediation.

**Comment ID:** 477

**Organization:** NASSCO

**DTR Section:** 4.7.1.3

**Comment:**

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IV.THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

B.The Tentative Cleanup and Abatement Order Is Technically Infeasible to Achieve Because Uncontrolled Sources Of Pollution Unrelated To NASSCO Are Impacting Sediment At The Shipyard (Findings 12, 30, 32, 33)

Chollas Creek is immediately adjacent to the NASSCO shipyard and discharges contaminated storm water at extraordinarily high volumes during rain events, along with dry weather run-off. See Attachment A, NASSCO Photos of Chollas Creek Stormwater Plume (2005); see also Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, Draft Technical Report (March 9, 2007) (“[E]ach season’s major storms will effectively remove any metals accumulated in the [Chollas] Creek sediment and transport them downstream to San Diego Bay.”). [Comment No. 205, TCAO, at 4, 33, DTR, at 4, 33.1-33.4]. The plume of contaminated water from Chollas Creek during rain events has been shown to extend more than a kilometer from the discharge point including the area within NASSCO’s leasehold, and contributes an array of pollutants to the Site. DTR, at 4-1, 4-14 – 4-15; see also Deposition of Cynthia Gorham (“Gorham Depo”), at 74:20 – 76:18 (confirming that some fine sediment from Chollas Creek is deposited in the vicinity of NA22). The storm water contains PCBs, pyrogenic hydrocarbons, oil and grease, synthetic organics, and heavy metals, among other pollutants, with estimated average annual pollutant loads of 429 kg copper, 301 kg lead, 2906 kg zinc, 2.7 kg PAH, 20g chlordan, 0.4g PCBs, 850 g arsenic, and 80g mercury. DTR, at 4-5 – 4-6; Watershed Monitoring and Modeling in Switzer, Chollas, and Paleta Creek Watersheds (Schiff, January 30, 2007 Stakeholder Work Group Meeting). Id. Chollas Creek has

also been identified as a significant, if not exclusive, source of pesticides in the sediment at the leaseholds. Exponent Report, at § 19-1, Figures 4-18, 4-20. Storm water containing similar pollutants also drains into the leaseholds both directly and indirectly, from a number of sources, including adjacent city streets, and large city storm drains. DTR, at 4-5; see also Barker Depo, at 160:16 – 161:23, 162:22 – 164:8. As discussed below, these discharges are associated with observed effects at the Site, and active remediation is therefore inappropriate unless and until these discharges are completely controlled:

**Comment ID:** 478  
**DTR Section:** 10.3

**Organization:** U.S. Navy

**Comment:**

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Navy Comment 1

The RWQCB's allegation that significant contaminants from Naval Base San Diego migrated to the Shipyard Sediment Site, either through discharges to Chollas Creek, resuspension of sediments through propeller wash, or via tidal currents is unfounded.

The TCAO alleges that the U.S. Navy "caused or permitted the discharge of waste to the Shipyard Sediment Site resulting in the accumulation of waste in the marine Sediment" due to historical activities at specific Installation Restoration Program (IRP) sites at Naval Base San Diego that may have resulted in the discharge of contaminants to San Diego Bay, and through resuspension of contaminated sediments due to propeller wash during ship movements at Naval Base San Diego (NBSD), with subsequent transport to other parts of San Diego Bay, including the Shipyard Sediment Site, by tidal currents as well as through Navy discharges to Chollas Creek.

Citations: TCAO Paragraph 10, DTR Finding 10 (including but not limited to Findings 10.1, 10.3, 10.4.1, 10.5, 10.6, 10.7, 10.8, 10.9, 10.10).

The U.S. Navy maintains that these claims are based on the largely unsubstantiated assumptions that (1) Shipyard Sediment Site contaminants of concern (COCs) were released from specific IRP sites and transported to San Diego Bay, (2) sediments in San Diego Bay adjacent to the IRP sites were contaminated to levels sufficient to act as a potential source to the Shipyard Sediment Site, and (3) contaminated sediments in San Diego Bay adjacent to the IRP sites were subsequently resuspended by propeller wash associated with ship movements, transported by tidal currents to the Shipyard Sediment Site, and redeposited within the Shipyard Sediment Site. The analyses presented in this submission utilize the best available data and modeling capabilities to develop multiple lines of evidence to scientifically assess these claims. These lines of evidence were developed by evaluating historical information related to potential transport of COCs from the IRP sites to San Diego Bay, analyzing COC concentration data for bay sediments to determine whether chemical concentrations, PCB fingerprinting of sediments at the Shipyard Sediment Site is consistent with the presence of two distinct, localized sources of PCBs. If these PCBs were derived from activities at NBSD, the signatures would be similar. The spatial distribution of PCBs at the Shipyard Sediment Site is consistent with the presence of two

different sources, with concentrations found at the north end of the site higher than those at the south end.

A modeling simulation was performed specifically to evaluate the claim that sediments adjacent to IRP sites may have been resuspended by propeller wash, transported to the Shipyard Sediment Site by tidal currents, and redeposited within the Shipyard Sediment Site. The modeling results indicate that net deposition to the Shipyard Sediment Site proposed remediation footprint due to resuspension and transport from areas adjacent to IRP sites at NBSD was between 0.17 percent and 0.37 percent of the total annual deposition, an amount that is negligible in the overall deposition of sediments at the Shipyard Sediment Site. Collectively, these lines of evidence indicate that the overall contribution of IRP sites to contamination at the Shipyard Sediment Site is negligible.

Likewise, the Navy's contribution to contaminant loading in Chollas Creek is negligible as demonstrated by the small relative portion of the Chollas Creek contaminant loading to the Bay that can be attributed to the Navy stormwater discharges, the portion of the solids loading from the Creek that is likely deposited at the shipyard sediment site, the observed spatial gradients of contamination in the area, and the relative chemical signatures of bottom sediments in the area.

**Comment ID:** 479

**Organization:** U.S. Navy

**DTR Section:** 10

**Comment:**

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Navy Comment 2

The RWQCB's allegation that historical Navy operations at the 28th Street Mole Pier contributed to the contamination at the Shipyard Sediment Site is unfounded, and the Navy's 2004 comment submission on this subject incorrectly assumed that shipyard operations were part of the Navy leasehold.

Citations: TCAO Paragraph 10, DTR Finding 10 (including but not limited to Findings 10.4.2, 10.6, 10.10).

This comment provides a chronological history of activities at the property in the area of the 28th Street Mole Pier, located on the eastern shoreline of San Diego Bay in San Diego, California. The property is currently leased by the National Steel and Shipbuilding Company (NASSCO). No documentation was found to support the allegation of Navy industrial use of the area currently leased by NASSCO. Navy use in this area appears to have been limited to temporary housing in two areas during the 1940s and operation of small landings, first on the north side of the 28th Street Mole Pier (near its western terminus) and later on the south side near the base (eastern end) of the pier. A summary of the Navy's use of the 28th Street pier is given below, with a comprehensive review provided in Appendix A to this comment submission.

TEMPORARY HOUSING EAST OF 28TH STREET MOLE PIER East of the 28th Street Mole Pier, in an area east of 28th Street and south of Belt Street, temporary officers quarters were used by the Navy on leased City of San Diego property from approximately 1941 through 1946, in the

area known as Parcel 1. During approximately 1941 and 1942 a Temporary Defense Housing Camp occupied a parcel located southwest of the intersection of Belt Street and 28th Street. Industrial development in both these areas appears to have taken place after Navy use had ended.

**28TH STREET SHORE BOAT LANDING FACILITY** The Navy operated a 28th Street Shore Boat Landing facility on the north side of the 28th Street Mole Pier from approximately 1939 through 1956. This facility, located near the western terminus of the 28th Street Mole Pier, consisted of a storage room, a waiting room, and a finger pier and floating docks used by ship launches to ferry sailors to and from Navy ships moored in San Diego Bay (Navy 2004). Non-Navy industrial activities on 28th Street Mole Pier during this time period included a shipbuilding and maintenance facility located partly on a wooden wharf extending along the north face of the 28th Street Mole Pier and partly on the shore north of the base (eastern end) of the pier. By 1946, Lynch Shipbuilding Company was operating the facility, and by 1956, National Marine Terminal Incorporated was operating it. Industrial operations shown for this facility include machine, woodworking, pattern, electric, and welding shops; a foundry; and a mold loft.

**SMALL CRAFT LANDING, SOUTHERN END OF 28TH STREET**

In 1956, a permit was granted to the Navy for use of a parcel located east of the 28th Street Mole Pier, at the southern end of 28th Street, apparently as a replacement for the loss of the Shore Boat Landing facility on the north side of the 28th Street Mole Pier. A small landing can be seen in this area in aerial photos from 1964, 1974, and 1978. No other Navy activities were seen in this parcel. Industrial development of the parcel appears to have occurred after Navy use had ended.

**Comment ID:** 480

**Organization:** Port District

**DTR Section:** 33

**Comment:**

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The Port is supportive of the proposed cleanup approach reflected in the TCAO and DTR, while reserving the right to consider any comments that may come in during the public comment period. According to Regional Board Executive Officer and CUT team head, David Gibson, this is exactly the type of support which the CUT is seeking and would expect from the Port. (Exhibit " 1 " [Gibson Deposition], 43:4-22.)

To illustrate this support, the Port's designated expert, Dr. Michael Johns, provides support for the proposed remedial footprint. (Exhibit "2" [Port Expert Designation]; Exhibit "3" [Dr. Johns Declaration], paragraphs 8-9.) In particular, Dr. Johns agrees with the process used to identify the polygons for the remedial footprint and has concluded that the factors used to select "worst first" polygons are consistent with the findings.

**Comment ID:** 481

**Organization:** Port District

**DTR Section:** 28

**Comment:**

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Dr. Johns also agrees that the Shipyard sediment contamination has contributed to the impairment of beneficial uses in San Diego Bay and likely continues to harm human health and

environmental resources. (Exhibit "3" [Dr. Johns Declaration], paragraph [5(a)-(d).] In this regard, Dr. Johns has concluded that the contaminants are bioaccumulating in biota relevant to human health and that exposed fish and shellfish can migrate offsite, spreading the reach of the contamination throughout the San Diego Bay and potentially to those who consume the exposed fish and shellfish. (Exhibit "3" [Dr. Johns Declaration], paragraph 6(a)-(d).) Likewise, the shipyard activities are likely exposing and/or redistributing legacy contaminants that create an ongoing source of San Diego Bay contamination. (Exhibit "3" [Dr. Johns Declaration], paragraph 7(a)-(d).)

**Comment ID:** 482

**Organization:** Coastkeeper and EHC

**DTR Section:** 31

**Comment:**

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IV.E. The DTR Contains Incorrect Statements.

In performing the economic feasibility analysis, the Cleanup Team created a worst-to-least contaminated ranking of each of the 66 polygons in the Shipyard Sediment Site. See DTR Appendix 31. The DTR claims that the ranking process "used Triad data and site-specific median effects quotient (SS-MEQ)." DTR § 31.1 at 31-2. However, the Excel file used to create the worst-to-least contaminated ranking only includes the SS-MEQ and not Triad data. See Appendix 31, "2010-07-27 Economic feasibility 07-27-10.ng.xls" (SAR384569).

**Comment ID:** 483

**Organization:** Coastkeeper and EHC

**DTR Section:** 32

**Comment:**

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IV.E. The DTR Contains Incorrect Statements.

The Order incorrectly concludes that "clean-up of the remedial footprint will restore any injury, destruction, or loss of natural resources." See Order Finding 32 at 16. The San Diego Regional Board does not have authority to conduct natural resource damage assessments because only the Natural Resources Trustees have authority to conduct natural resource damage assessments and to draw conclusions regarding injury to natural resources and the effectiveness of remedial actions in terms of restoring natural resource values. See MacDonald 2011 at 20.

**Comment ID:** 484

**Organization:** BAE Systems

**DTR Section:** 32

**Comment:**

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•SDC and EHC also state that "the San Diego Regional Board does not have authority to conduct natural resource damage assessments."

This statement is an unwarranted extrapolation of a single mention of "natural resources" in the TCAO, in which it is simply stated that "Cleanup of the remedial footprint will restore any injury, destruction, or loss of natural resources." The statement in no way addresses service losses, monetary damages, or any of the other parameters unique to natural resource damage



assessments. The statement simply articulates that the cleanup of the remedial footprint at the Shipyard Site will improve environmental conditions such that natural resources like those evaluated in detail at the Shipyard Site (i.e., benthic macroinvertebrates, fish, and aquatic dependent wildlife) will benefit. The SDC/EHC statement is therefore irrelevant.

**Comment ID:** 485

**Organization:** SDG&E

**DTR Section:** 28

**Comment:**

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Given the many critical deficiencies in the CRWQCB's human health risk assessment of the Site, it is clear that a human health risk determination is not supported by the evidence at the Site.

Parameters used in CRWQCB (2010) to estimate the potential exposure of anglers to Site chemicals greatly overestimate human exposure and risk at the Site (Finley, 2011). For example, CRWQCB (2010)

Site-specific human health risk assessment exposure assumptions estimate exposure for an angler deriving 100% of their fish or shellfish diet from prey items at the Site for a period of 30 years. Mr. Tom Alo, the CRWQCB's Person Most Knowledgeable (PMK) and lead CRWQCB human health risk assessor assigned to the Site, stated in his February 16, 2011 deposition that that he agreed that these

exposure assumptions were unrealistic. Using more realistic Site-specific human health exposure assumptions, Finley (2011) calculated human health hazard and risk estimates that are below thresholds of concern (Hazard Index of 1, Excess Lifetime Cancer Risk of  $1 \times 10^{-5}$ , per OEHHA (2006, 2008)) for the NASSCO portion of the Site. Using the same approach and parameters detailed in Finley (2011), the highest risk potential for the inside BAE portion of the Site for the three human health chemicals of concern was found to be  $1.7 \times 10^{-6}$  for cancer risk and 0.33 for noncancer hazard, as shown in Tables 24-26. Both of these risk estimates were associated with PCBs for ingestion of spotted sand bass by the "upper bound" angler. All risk and hazard estimates for the inside BAE portion of the Site (Table 26)

are below OEHHA (2006, 2008) thresholds of concern and do not indicate human health BUI.

**Comment ID:** 486

**Organization:** SDG&E

**DTR Section:** 28

**Comment:**

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3.2 Fractional Intake Assumptions

The CRWQCB (2010) Fractional Intake assumption is technically flawed because anglers are not currently exposed to Site chemicals (Exponent, 2003; Finley, 2011). Current Site security measures prohibit fishing or collection of shellfish. The assumption that anglers derive 100% of their fish and shellfish diet from Site is untenable. CRWQCB (2010) supports their assumption at pages 27-4 to 27-5 of the DTR with the following hypotheses:

1. Shipyard workers fish at the Site;
2. Future angling opportunities may occur if the Site ceases to be used as a shipyard;

3. Chemicals may migrate to nearby public angling areas (i.e., Crosby Street Pier); and
4. CRWQCB is mandated to address Human Health BUI regardless of whether it is possible for human health exposure to chemicals to occur.

Regarding shipyard worker angling activity, there is no evidence for this occurrence, and such activity is prohibited by current Site security measures. Finley (2011), via a review of security camera footage, confirmed that no angling activity occurs at NASSCO. Because BAE has similar security measures, it can be concluded that shipyard workers are not angling at the Site. Mr. Tom Alo, the CRWQCB's Person Most Knowledgeable (PMK) stated in his February 16, 2011 deposition that CRWQCB has no evidence regarding angling at the Site (Alo, 2011). Mr. Alo further stated that the assumption that angling was taking place was unrealistic (Alo, 2011).

Regarding future exposure scenarios, the current human health risk assessment cannot be used to predict risk for a hypothetical future scenario in which Site access to anglers is granted because concentrations of chemicals in sediment may be decreasing and may continue to decrease during the 23 or more years remaining in the current BAE and NASSCO subleases (Conder, 2011b). Assuming a quantitative relationship between chemicals in Site sediment and chemicals in Site biota, the concentrations of chemicals in fish and shellfish, as measured in 2001-2002 and used in the current CRWQCB human health risk assessment, cannot be expected to equate with values in 2034 and/or 2040 (Conder, 2011c).

Regarding the migration of chemicals to nearby public angling areas (i.e., Crosby Street Pier), it is clear from Site sediment data that chemicals are not migrating from the Site in sufficient amounts to warrant concerns of human health risk (Conder, 2011c). Available studies on the migration ecology of fish and shellfish also indicate that resident Site fish and shellfish are unlikely to migrate to Crosby Street Pier (Conder, 2011c). If migration does occur, human health exposure parameters assumed by CRWQCB (2010), such as concentrations of chemicals in fish and consumption rate, cannot be applied to evaluate risk associated with any Site fish caught at Crosby Street Pier. Evaluating Site-derived risk at Crosby Street Pier would require estimation of the proportion of Site fish consumed by Crosby Street Pier anglers, because it is unreasonable to assume that 100% of animals consumed by anglers at Crosby Street Pier would originate from the Site. Additionally, it is uncertain whether the concentration of Site chemicals in any long-distance fish and lobster migrants caught at Crosby Street Pier would be as high as individuals that restrict their movements within the boundaries of the Site, because it is possible that these long-distance fish and lobster migrants may eliminate Site-derived chemicals from tissue in the time period between the departure from contaminated areas of the Site and capture at Crosby Street Pier.

**Comment ID:** 487

**Organization:** SDG&E

**DTR Section:** 28

**Comment:**

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3.3 CRWQCB Tier 2 Risk Assessment

As noted above and by Finley (2011), the CRWQCB (2011) Tier 2 human health risk assessment fails to follow standard USEPA (1989) guidance because it did not accurately address realistic human health exposure conditions at the Site by accurately applying Site-specific exposure parameters and considerations. The assessment comprised an unrealistic, “worst case” scenario that appears to have been driven by non-technical, policy considerations. For example, Alo (2011) stated that all chemicals of concern were included in the Tier 2 analysis regardless of earlier screening analyses (Tier 1) that demonstrated an absence of risk. Alo (2011) stated that the Tier 2 analysis was favored a matter of policy such that the CRWQCB “erred on the conservative, more protective side”. Thus, the overall framework of the Tier 1 and 2 human health risk assessments, described on page 26-1 of CRWQCB (2010), appears to be needlessly complicated and contrary to applicable regulatory guidance since Tier 1 results were ignored in preference for the unrealistic and non Site-specific Tier 2 assessment.

**Comment ID:** 488

**Organization:** SDG&E

**DTR Section:** 28

**Comment:**

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3.4 Conclusion

In conclusion, the CRWQCB (2010) determination of Human Health BUI is speculative, lacks scientific foundation, and fails to properly apply site-specific exposure parameters in accordance with applicable regulatory guidance to properly substantiate a finding of human health impairment at the Site. There is no evidence to support a conclusion that Site-derived chemicals impair Commercial and Sport

Fishing and Shellfish Harvesting Beneficial Uses in San Diego Bay. Because there is no evidence of a Human Health BUI, consideration of human health should be withdrawn from Site decision-making algorithms (e.g., SWAC-based assessments of Findings 32-33 in CRWQCB (2010)) used to identify areas for potential remedial action.

**Comment ID:** 489

**Organization:** NASSCO

**DTR Section:** 24

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

a. Regional Board Staff’s Analysis Employs Assumptions That Are Overly Conservative And Unrealistic, And Bias The Results

Comment No. 135-148

In the process of conducting a Tier-II risk analysis, Staff made several assumptions that were overly conservative and biased the results of the analysis in a way that preordained the conclusion that aquatic-dependent wildlife uses were impaired by Shipyard sediment. [Comment No. 135, TCAO, at 24, DTR, at 24].

Second, it is standard practice to set a limit for acceptable dietary exposure for any chemical by picking a point between an established no-observed-adverse-effect-level (“NOAEL”) (a level of exposure that is believed to have no adverse effects on receptors of concern) and the lowest-observed-adverse-effect-level (“LOAEL”) (the lowest level of exposure shown to have adverse effects on receptors of concern). In fact, “[e]xposure levels between the no-effect and expected effect thresholds fall into an undefined area with regard to predicted risk, in which careful interpretation and professional judgment are required to assess risk.” Ginn Report, at 66; DTR, at 24-12 (“the actual threshold of adverse effects is predicted to lie somewhere between these two thresholds”). [Comment No. 140, TCAO, at 24, DTR, at 24.2.3, 24.2.4].

Instead of carefully exercising such judgment, however, the Staff simplistically looked for any chemical that exceeded a hazard quotient of 1.0 for any effect threshold—whether it be a no-effect or expected-effect threshold—that was also higher than reference exposure. DTR, at Figure 24-1; Alo Depo, at 360:11-361:7. [Comment No. 141, TCAO, at 24, DTR, at 24.2.5]. As demonstrated in Table 24-3, the only hazard quotients that exceeded 1.0 for any receptor of concern and for any pollutant were no-effect thresholds – in fact, in no instance were any expected-effect thresholds exceeded. DTR, at 24-6, Table 24-3. Despite acknowledging that the “actual threshold of adverse effects is predicted to lie somewhere between” a no-effect and expected-effect threshold, the Staff made no attempt to calculate where that point may be for any chemical with respect to any receptor. DTR, at 24-12; Alo Depo., at 357:2-358:2. [Comment No. 142, TCAO, at 24, DTR, at 24.1, 24.2.3, 24.2.4, Appendix 24].

As with Staff’s selection of an unrealistic and overly conservative area-use factor, described above, the decision to use an exceedence of a hazard quotient of 1.0 for no-effect thresholds drives the determination that aquatic-dependent wildlife beneficial uses are impaired. [Comment No. 143, TCAO, at 24, DTR, at 24.1, 24.2.5]. Furthermore, because the AUF contributes to the calculation of ingestion rates of sediment, the unrealistic assumption described above compounds the unrealistic nature of Staff’s analysis and contributes to the conclusion that aquatic-dependent wildlife uses are impaired. [Comment No. 144, TCAO, at 24, DTR, at 24, Appendix 24].

Neither the DTR nor the TCAO provide any rationale for this approach, despite the fact that U.S.E.P.A. staff have recommended using the geometric mean between no-effect and expected-effect thresholds as an appropriate way to calculate hazard quotients. [Comment No. 145, TCAO, at 24, DTR, at 22, 24.2.3, 24.2.4]. Furthermore, had Staff used the geometric mean between no-effect and expected-effect thresholds to calculate hazard quotients, the result would have been no hazard quotient greater than 1.0 for any receptor for any chemical, even with the unrealistic AUF assumption of 1.0, except for lead. Ginn Report, at 67-69, Table 7. [Comment No. 146, TCAO, at 24, DTR, at 24, Appendix 24]. Furthermore, the Ginn Report notes that the only reason why a hazard quotient greater than 1.0 using the geometric mean would be reached for lead is because Staff selected an unrealistic toxic reference value for lead. Ginn Report, at 71-72. [Comment No. 147, TCAO, at 24, DTR, at 24.2.3, 24.2.4]. Regardless, the TCAO and

DTR do not select lead as a primary contaminant of concern for the Shipyard Site, and no alternative cleanup level for lead has been proposed. [Comment No. 148, TCAO, at 24, 29, 32, DTR, at 24, 29.3, 32.3].

**Comment ID:** 490

**Organization:** NASSCO

**DTR Section:** 15, 21-24, 28

**Comment:**

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IV. THE TENTATIVE CLEANUP AND ABATEMENT ORDER IS OVERLY  
CONSERVATIVE AND TECHNICALLY INFEASIBLE TO ACHIEVE

A. Extensive Scientific Investigation Shows That Beneficial Uses At The Shipyard Are Not Unreasonably Impaired (Findings 13 – 28)

3. There Is No Significant Risk To Aquatic-Dependent Wildlife (Findings 19, 21-24, 32)

c. Any Potential Negative Effects From Shipyard Contaminants Are Not Observed In Fish Beyond The Leasehold (Findings 15, 21-24, 28)

Comment No. 154-161

In addition to assessing chemical concentrations in fish tissue, the DTR also analyzed fish histopathology results for fish caught (1) inside the leasehold, (2) just outside the leasehold, and (3) at reference stations. These data corroborated the results of the fish tissue analysis, and found that fish inside the leasehold were “healthy, with no elevation in significant liver lesions or other abnormalities related to chemical exposures at the site.” Ginn Report, at 15. As discussed previously in Section IV.a.2.b.(4), a conservative analysis of the results showed that only four of the 70 lesions were evaluated were found to be significantly elevated in shipyard fish (compared to six of 70 in reference fish). [Comment No. 158, TCAO, at 15, 21-24, DTR, at 15, 21-25, Appendix 15]. The results also indicated that the health of spotted sand bass was not adversely affected by proximity to the shipyards, and that fish caught just outside, but adjacent to, the NASSCO leasehold were generally no different from reference fish, with respect to both microscopic and macroscopic fish lesions. Section IV.A.2.b.(4); see also DTR, App. 15, at 15-8 – 15-9, Table A15-5. [Comment No. 159, TCAO, at 15, 21-24, DTR, at 15, 21-25, Appendix 15]. In fact, only one of the 70 types of lesions evaluated was found to be significantly elevated in fish caught just outside the NASSCO leasehold, compared to reference fish. DTR, at Tables A15-4 and A15-5. [Comment No. 160, TCAO, at 15, 21-24, DTR, at 15, 21-24, Appendix 15]. Accordingly, these results suggest that, even if there are potential negative effects on fish within the leasehold, shipyard contaminants are not affecting fish beyond the leasehold and potentially contaminated fish are not migrating beyond the leasehold. [Comment No. 161, TCAO, at 15, 21-24, DTR, at 15, 21-24, Appendix 15].

**Comment ID:** 495

**Organization:** SDG&E

**DTR Section:** 9

**Comment:**

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Response to Comments Report  
TCAO No. R9-2011-0001 and DTR

See the San Diego Water Board website for the full text of SDG&E's request for rescindment.

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/shipyards\\_sediment/2005\\_0126adt.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/shipyards_sediment/2005_0126adt.shtml)