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DOCUMENT REQUESTS

All DOCUMENTS RELATING TO any work YOU performed regarding the
 human health risk assessment utilized in connection with the proposed cleanup levels and
 remediation of the SITE.

6 2. All DOCUMENTS RELATING TO any work YOU performed regarding the
remediation of the SITE.
3. All DOCUMENTS RELATING TO any work YOU performed regarding the
economic feasibility analysis utilized in connection with the proposed cleanup levels and
remediation of the SITE.

124.All DOCUMENTS RELATING TO any work YOU performed regarding the13:technological feasibility analysis utilized in connection with the proposed cleanup levels and14remediation of the SITE.

All DOCUMENTS RELATING TO any work YOU performed regarding the cost
 analysis utilized in connection with the proposed cleanup levels and remediation of the SITE.
 All DOCUMENTS RELATING TO any work YOU performed regarding the
 and remedy selection alternatives analysis utilized in connection with the proposed cleanup levels
 and remediation of the SITE.

20 7. All DOCUMENTS RELATING TO any work YOU performed regarding the 21 aquatic life impairment analysis utilized in connection with the proposed cleanup levels and 22 remediation of the SITE.

All DOCUMENTS RELATING TO any work YOU performed regarding the
 aquatic-dependent wildlife impairment analysis utilized in connection with the proposed cleanup
 levels and remediation of the SITE

26 9. All DOCUMENTS RELATING TO any work YOU performed regarding the
27 bioavailability analysis utilized in connection with proposed cleanup levels and remediation of
28 the SITE.

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SECOND AMENDED NOTICE OF DEPOSITION OF CRAIG CARLISLE

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10. All DOCUMENTS RELATING TO any work YOU performed regarding any alternative sediment cleanup levels analysis utilized in connection with the proposed cleanup levels and remediation of the SITE.

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Dated: January 24, 2011

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4 11. All DOCUMENTS RELATING TO any work YOU performed regarding any
5 remedial monitoring analysis utilized in connection with the proposed cleanup levels and
6 remediation of the SITE.

12. All DOCUMENTS RELATING TO any work YOU performed regarding the analysis of the contribution of stormwater to sediment contamination in the San Diego Bay, utilized in connection with the proposed cleanup levels and remediation of the SITE.

13. All DOCUMENTS RELATING TO any COMMUNICATIONS between YOU
 and ENVIRONMENTAL GROUPS RELATING TO the TENTATIVE ORDER or
 TECHNICAL REPORT.

13 14. All DOCUMENTS RELATING TO any COMMUNICATIONS between YOU
14 and any local, state or federal agency RELATING TO the TENTATIVE ORDER or
15 TECHNICAL REPORT.

16 15. All DOCUMENTS RELATING TO any COMMUNICATIONS between YOU
17 and the ADVISORY TEAM RELATING TO the TENTATIVE ORDER or TECHNICAL
18 REPORT.

All DOCUMENTS RELATING TO any COMMUNICATIONS between YOU
 and any PERSON, other than a member of the CLEANUP TEAM, RELATING TO the
 TENTATIVE ORDER or TECHNICAL REPORT.

By

LATHAM & WATKINS LLP

Jeffrey P Carlin Attorneys for Designated Party National Steel and Shipbuilding Company

SECOND AMENDED NOTICE OF DEPOSITION OF CRAIG CARLISLE

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1	and the design of the second SPROOF OF	SERVICE
2	I am a resident of the State of California, over the age of eighteen years, and not a	
3	party to the within action. My business address is Latham & Watkins, 600 West Broadway,	
4	Suite 1800, San Diego, California 92101. On January 24, 2011, I served the within document(s):	
5		
6 7	NASSCO'S SECOND AMENDED NOTICE OF VIDEOTAPED DEPOSITION OF CRAIG CARLISLE	
8	BY E-MAIL: I caused the above-referenced documents to be converted in digital format (.pdf) and served by electronic mail to the addresses listed below.	
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10	Mike Tracy	Raymond Parra
11	Matthew Dart DLA Piper LLP US	DAE Systems ship Kepan nic.
12	401 B Street, Suite 1700 San Diego, California 92101-4297	PO Box 13308 San Diego, CA 92170-3308
13	mike.tracy@dlapiper.com matthew.dart@dlapiper.com Telephone: (619) 699-3620	raymond.parra@baesystems.com Telephone: (619) 238-1000+2030 Fax: (619) 239-1751
14	Fax: (619) 764-6620	ri vir Vaisku stadisk skadt zur bar i
15	Michael McDonough Counsel	Christopher McNevin
1 <u>6</u>	Bingham McCutchen LLP	Attorney at Law Pillsbury Winthrop Shaw Pittman LLP
17	A 355 South Grand Avenue, Suite 4400 Los Angeles, CA 90071-3106	725 South Figueroa Street, Suite 2800 Los Angeles, CA 90017-5406
18	michael.mcdonough@bingham.com Telephone: (213) 680-6600	chrismcnevin@pillsburylaw.com Telephone: (213) 488-7507
19	Fax: (213) 680-6499	Fax: (213) 629-1033
20	Brian Ledger Kristin Reyna	Christian Carrigan Senior Staff Counsel
21	Attorney at Law Gordon & Rees LLP	Office of Enforcement, State Water Resources Control Board
22	101 West Broadway, Suite 1600 San Diego, CA 92101	P.O. Box 100
23	bledger@gordonrees.com	Sacramento, CA 95812-0100 ccarrigan@waterboards.ca.gov
24	kreyna@gordonrees.com Telephone: (619) 230-7729	Telephone: (916) 322-3626 Fax: (916) 341-5896
25	Fax: (619) 696-7124	
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Marco Gonzalez Attorney at Law Coast Law Group LLP 1140 South Coast Highway 101 Encinitas, CA 92024 <u>marco@coastlawgroup.com</u> Telephone: (760) 942-8505 Fax: (760) 942-8515

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Jill Tracy Senior Environmental Counsel Sempra Energy 101 Ash Street San Diego, CA 92101 <u>itracy@sempra.com</u> Telephone: (619) 699-5112 Fax: (619) 699-5189

Leslie FitzGerald Deputy Port Attorney San Diego Unified Port District PO Box 120488 San Diego, CA '92112 <u>lfitzger@portofsandiego.org</u> 'Telephone: (619) 686-7224 Fax: (619) 686-6444

Nate Cushman 16 Associate Counsel 17 U.S. Navy SW Div, Naval Facilities Engineering Command 1220 Pacific Hwy 18 San Diego, CA 92132-5189 19 nate.cushman@navy.mil Telephone: (619) 532-2511 20 Fax: (619) 532-1663 21 Melanie Andrews Special Assistant U.S. Attorney 22 U.S. Department of Justice 880 Front Street, Room 6293

 23 San Diego, CA 92101-8893 <u>melanie.andrews@usdoj.gov</u>
 24 Telephone: (619) 557-7460
 Fax: (619) 557-5004

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ATTORNEYS AT LAW

SAN DIEGO

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James Handmacher Attorney at Law Morton McGoldrick, P.S. PO Box 1533 Tacoma, WA 98401 <u>jvhandmacher@bvmm.com</u> Telephone: (253) 627-8131 Fax: (253) 272-4338

Sharon Cloward Executive Director San Diego Port Tenants Association 2390 Shelter Island Drive, Suite 210 San Diego, CA 92106 <u>sharon@sdpta.com</u> Telephone: (619) 226-6546 Fax: (619) 226-6557

William D. Brown Brown & Winters 120 Birmingham Drive, #110 Cardiff By The Sea, CA 92007 <u>bbrown@brownandwinters.com</u> Telephone: (760) 633-4485 Fax: (760) 633-4427

Roslyn Tobe Senior Environmental Litigation Attorney U.S. Navy 720 Kennon Street, #36, Room 233 Washington Navy Yard, DC 20374-5013 roslyn.tobe@navy.mil Telephone: (202) 685-7026 Fax: (202) 685-7036

Sandi Nichols Allen Matkins Three Embarcadero Center, 12th Floor San Francisco, CA 94111 <u>snichols@allenmatkins.com</u> Telephone: (415) 837-1515 Fax: (415) 837-1516

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Laura Hunter Environmental Health Coalition 401 Mile of Cars Way, Suite 310 National City, CA 91950 <u>laurah@environmentalhealth.org</u> Telephone: (619) 474-0220 Fax: (619) 474-1210

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C. Scott Spear U.S. Department of Justice, Environmental Defense Section P.O. Box 23986 Washington, D.C. 20026-3986 <u>scott.spear@usdoj.gov</u> Telephone: (202) 305-1598 Fax: (202) 514-8865

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Gabe Solmer Jill Witkowski San Diego Coastkeeper 2825 Dewey Road, Suite 200 San Diego, CA 92106 gabe@sdcoastkeeper.org jill@sdcoastkeeper.org Telephone: (619) 758-7743 Fax: (619) 223-3676

Sarah R. Brite Evans Schwartz Semerdjian Haile Ballard & Cauley 101 West Broadway, Suite 810 San Diego, CA 92101 Telephone (619) 236-8821 Fax: (619) 236-8827 sarah@ssbclaw.com

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I declare under penalty of perjury according to the laws of the State of California

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that the above is true and correct. Executed on January 24, 2011, at San Diego, California.

Shelley R. Campbell

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LATHAM WATKINS SD\722137.3 Attorneys At LAW

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In the matter of Tentative Cleanup San Diego Water Board Cleanup and Abatement Order No. R9-2011-0001 (Shipyard Sediment Cleanup) Designations

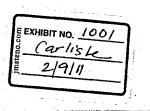
Team's Amended Witness

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TO ALL PARTIES AND TO THEIR ATTORNEYS OF RECORD HEREIN; 生产的 机合金 计结合 East of the spinnin ally PLEASE TAKE NOTICE that, pursuant to the Presiding Officer's February 18, 2010 Order Issuing Final Discovery Plan Etc., and all applicable Orders in the above-referenced proceeding, Designated Party the California Regional Water Quality Control Board, San Diego Region Cleanup Team ("Cleanup Team") hereby designates the following witness who may testify in the above-referenced proceeding. 2. 制造的,这也也有中国的有效 1-2-1941 - Siles en en alger an anter en ster en en en en

- David Gibson Executive Officer, Former Branch Chief of the Water Quality Restoration Standards Branch and an Environmental Program Manager 1.
- David Barker Branch Chief of the Surface Waters Basins Branch and a Supervising Water Resource Control Engineer.
- Julie Chan Branch Chief of the Ground Water Basins Branch and a Supervising Engineering Geologist.
- Craig Carlisle Senior Engineering Geologist.
- Tom Alo Water Resource Control Engineer.



- Vicente Rodriguez Water Resource Control Engineer.
- All persons designated as witnesses by any other Designated Party under the Presiding Officer's February 18, 2010 Order Issuing Final Discovery Plan, Etc. and all applicable Orders.

PLEASE TAKE FURTHER NOTICE that Alan Monji, Cynthia Gorham-Test, Benjamin Tobler and Peter Peuron, all of whom were previously designated as potential witnesses by the Cleanup Team will not testify.

Each of the specifically-identified above-referenced witnesses may testify regarding some or all aspects of Cleanup and Abatement Order No. R9-2011-0001 and/or the contents of the accompanying Draft Technical Report, has agreed to testify in this proceeding, and is sufficiently familiar with this proceeding to submit to an oral deposition concerning his of her specific testimony, but none will be paid a fee for his or her testimony.

Each of the specifically-identified above-referenced witnesses may testify as a percipient witness, and/or, with the exception of Vicente Rodriguez, may offer an expert opinion within the scope of his or her expertise as an employee of the San Diego Water Board.

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ALLOND STREET CHARTER OF

The address for all of the specifically-identified witness above is 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4353.

Dated: January 18, 2011

Respectfully submitted,

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION CLEANUP TEAM

By: Christian Carrigan

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

In the matter of Tentative Cleanup and Abatement Order No. R9-2011-0001 (Formerly R9-2010-0002) Shipyard Sediment Cleanup Regional Board Cleanup Team's Responses & Objections to Designated Party San Diego Unified Port District's First Set of Requests for Admissions

Propounding Party: San Diego Unified Port District (the "Port") Responding Party: California Regional Water Quality Control Board, San Diego Region Cleanup Team

Set Number: One (1)

Pursuant to the Presiding Officer's February 18, 2010 Order Issuing Final Discovery Plan for Tentative Cleanup and Abatement Order No. R9-2010-0002 and Associated Draft Technical Report, the Presiding Officer's October 27, 2010 Order Reopening Discovery Period, Establishing Discovery Schedule, and Identifying Star and Crescent Boat Company as a Designated Party for Purposes of Tentative Cleanup and Abatement Order R9-2011-0001 (the "10.27.10 Order"), the Parties' August 9, 2010 Stipulation Regarding Discovery Extension and all applicable law, Designated Party the San Diego Water Board Cleanup Team ("Cleanup Team"), hereby responds and objects to the Port's First Set of Requests for Admissions (the "Requests") as follows:

EXHIBIT NO. 1002 Carliske 2|9|11

GENERAL STATEMENT OF OBJECTIONS

The Cleanup Team makes the following general objections, whether or not separately set forth in response to each Request, to each and every Request by the Port, all as set forth herein and incorporated specifically into each of the responses below:

1. Privilege Objection. The Cleanup Team objects to each Request to the extent it requests information protected by the attorney-client privilege, joint prosecution privilege, common interest privilege, mediation privilege, official information privilege and/or deliberative process privilege, and to the extent it requests information subject to the work-product exemption, collectively referred to herein as the "privilege" or "privileged." The Cleanup Team contends that all communications exchanged between it and its counsel are privileged. The Cleanup Team objects to identifying or producing any and all products of investigations or inquiry conducted by, or pursuant to the direction of counsel, including, but not limited to, all products of investigation or inquiry prepared by the Cleanup Team in anticipation of this proceeding, based on the attorney-client privilege and/or the work-product doctrine. The Cleanup Team further objects to providing information subject to or protected by any other privilege, including, but not limited to, settlement communications, the joint prosecution privilege, the common interest privilege, the mediation privilege, the official information privilege and/or the deliberative

process privilege. Inadvertent provision of privileged information shall not constitute a waiver of said privileges.

- Scope of Discovery Objection. The Cleanup Team objects to each Request to the extent it purports to impose any requirement or discovery obligation other than as set forth in Title 23 of the California Code of Regulations, sections 648 et seq., the California Government Code, sections 11400 et seq. and/or applicable stipulations, agreements and/or orders governing this proceeding, including, but not limited to, the limitations on the proper subject matter for the Port's discovery to the Cleanup Team, as specifically set forth in the 10.27.10 Order; to wit: "[T]he scope of additional discovery allowed by this Order is limited to revisions to the TCAO/DTR released on September 15, 2010 as compared to the December 2009 versions of these documents." The Cleanup Team further objects to instructions set forth in the Port's "DEFINITIONS" that are inconsistent with, and/or to the extent they purport to impose obligations on the Cleanup Team not specifically set forth in, Title 23 of the California Code of Regulations, sections 648 et seq., the California Government Code, sections 11400 et seq. and/or applicable stipulations, agreements and/or orders governing this proceeding.
- 3. <u>Irrelevant Information Objection</u>. The Cleanup Team objects to the Requests to the extent they are overbroad and/or seek information that is not relevant to the claims or defenses asserted in this proceeding and is not reasonably calculated to lead to the discovery of admissible evidence.
- 4. <u>Burdensome and Oppressive Objection</u>. The Cleanup Team objects to each Request to the extent that it seeks information that has

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already been provided, or that otherwise is equally available to the Port, or is already in the Port's possession, which renders the Request unduly burdensome and oppressive. The Cleanup Team has already provided the Port with a copy of the electronic, text searchable administrative record and supplemental administrative record for this matter. Therefore, the burden of providing information that is equally accessible to the Port is no greater on the Port than it would be on the Cleanup Team, and the Cleanup Team will not provide again the information it has already provided and which is contained in the electronic, text searchable administrative record, or that is otherwise already in the Port's possession, custody or control.

- 5. <u>Overbroad Objection</u>. The Cleanup Team objects that certain Requests are overbroad, and are framed in a manner that prevents any reasonable ability to provide responsive information. Such Requests create an unreasonable risk of inadvertent noncompliance as framed.
- 6. <u>Cleanup and Abatement Order Proceeding is Ongoing</u>. The instant Cleanup and Abatement Order proceeding is ongoing, and the Cleanup Team expects that additional evidence will be provided by the Designated Parties hereto in accordance with governing statutes, regulations and applicable hearing procedures. While the Cleanup Team's response to each of these Requests is based on a reasonable investigation and the state of its knowledge as of this date, additional information may be made available to or otherwise obtained by the Cleanup Team subsequent to the date of this response. These responses are provided without prejudice to the Cleanup Team's right to supplement these responses, or to use in

Cleanup Team Responses to Port RFAs

this proceeding any testimonial, documentary, or other form of evidence or facts yet to be discovered, unintentionally omitted, or within the scope of the objections set forth herein.

OBJECTIONS TO DEFINITIONS

- 1. The Cleanup Team objects to the defined term "DOCUMENT" on the ground and to the extent that it seeks information protected by settlement confidentiality rules, the attorney-client privilege, the joint prosecution privilege, the work product doctrine, the mediation privilege, the common interest privilege, the official information privilege, the deliberative process privilege, and/or any other privilege or confidentiality protection.
- 2. The Cleanup Team objects to the defined term "COMMUNICATIONS" on the ground and to the extent that it seeks information protected by settlement confidentiality rules, the attorneyclient privilege, the joint prosecution privilege, the work product doctrine, the mediation privilege, the common interest privilege, the official information privilege, the deliberative process privilege, and/or any other privilege or confidentiality protection.
- 3. The Cleanup Team objects to the defined term "IDENTIFY" on the ground and to the extent it purports to impose requirements and/or obligations on the Cleanup Team in preparing these Responses not otherwise required by Title 23 of the California Code of Regulations, sections 648 et seq., the California Government Code, sections 11400 et seq. and/or applicable stipulations, agreements and/or orders governing this proceeding.

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Cleanup Team Responses to Port RFAs

4. The Cleanup Team objects to the defined term "MS4 SYSTEM" as hopelessly overbroad, unduly burdensome, not reasonably calculated to lead to the discovery of admissible evidence and beyond the scope of permissible discovery. The Cleanup Team will respond herein as if the term "MS4 SYSTEM" was defined to include those components of the Municipal Separate Storm Sewer Systems under Order No. 2007-001, NPDES No. CAS0108758 that RELATE TO the Cleanup Team's bases for naming the Port as a DISCHARGER in the CURRENT TCAO and CURRENT DTR.

RESPONSES TO REQUESTS FOR ADMISSIONS

REQUEST FOR ADMISSION NO. 1:

Admit that the Port District itself never contributed directly to the DISCHARGE of waste to the SITE.

RESPONSE TO REQUEST NO. 1:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request on the ground that it is vague and ambiguous with respect to the terms "Port District itself" and "contributed directly."

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

The Port contributed to the DISCHARGE of waste to the SITE as a co-permittee under its currently applicable MS4 permit, and the preceding permits. The Port has filed Reports of Waste Discharge with the Regional Board. The Port also contributed to the DISCHARGE of waste to the SITE because it has the ability and legal responsibility to

control the activities and DISCHARGES of its tenants. The Port's tenants' DISCHARGES could not have occurred without the Port allowing the discharging tenants to operate and conduct the activity on the land. The source of the DISCHARGE is the land controlled by the Port, which land held and managed as trust property on behalf of the People of the State of California. Further facts supporting the Cleanup Team's denial to this Request are set forth in Finding 11 of the TCAO and Chapter 11 of the DTR and will not be repeated here.

REQUEST FOR ADMISSION NO. 2:

Admit that the Port District itself never DISCHARGED storm water that contained waste into the City of San Diego MS4 SYSTEM onto the SITE.

RESPONSE TO REQUEST NO. 2:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request on the ground that it is vague and ambiguous with respect to the terms "Port District itself," "contributed directly" and "City of San Diego MS4 SYSTEM."

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

The Port is responsible for DISCHARGED storm water that contained waste to the SITE as a co-permittee under its currently applicable MS4 permit, and the preceding permits. The Port has filed Reports of Waste Discharge with the Regional Board. Further facts supporting the Cleanup Team's denial to this Request are set forth in Finding 11 of the TCAO and Chapter 11 of the DTR and will not be repeated here.

REQUEST FOR ADMISSION NO. 3:

Admit that the Port District itself never contributed directly to the DISCHARGE of storm water containing waste to the SITE through the City of San Diego MS4 SYSTEM.

RESPONSE TO REQUEST NO. 3:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request on the ground that it is vague and ambiguous with respect to the terms "Port District itself," "contributed directly" and "City of San Diego MS4 SYSTEM."

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

The Port contributed to the DISCHARGE of storm water containing waste to the SITE as a co-permittee under its currently applicable MS4 permit, and the preceding permits. The Port has filed Reports of Waste Discharge with the Regional Board. Further facts supporting the Cleanup Team's denial to this Request are set forth in Finding 11 of the TCAO and Chapter 11 of the DTR and will not be repeated here.

REQUEST FOR ADMISSION NO. 4:

Admit that the City of San Diego owns and operates the MS4 SYSTEM Storm Drain Outfalls identified as SW4 and SW9 in the CURRENT TCAO and CURRENT DTR that are alleged to have DISCHARGED storm water containing waste onto the SITE.

RESPONSE TO REQUEST NO. 4:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that it is vague and ambiguous with respect to the term "Storm Drain Outfalls...

DISCHARGED." The Cleanup Team further objects to the Request on the ground that NPDES Permit No. CAS0108758 speaks for itself and is the best evidence of its contents with regard to ownership and operation of the various components of the MS4

Cleanup Team Responses to Port RFAs

SYSTEM.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: The Cleanup Team admits that the City of San Diego owns the Storm Drain Outfalls identified as SW4 and SW9 in the CURRENT TCAO and CURRENT DTR which are the point sources from which it is alleged storm water containing wastes were DISCHARGED onto the SITE. The Cleanup Team also admits that the City of San Diego is one of the operators of the MS4 SYSTEM identified in NPDES Permit No. CAS0108758, which MS4 SYSTEM includes Storm Drain Outfalls SW4 and SW9. Except as specifically admitted, the remainder of the Request is denied.

REQUEST FOR ADMISSION NO. 5:

Admit that the Port District does not own or operate the MS4 SYSTEM Storm Drain Outfalls identified as SW4 and SW9 in the CURRENT TCAO and CURRENT DTR that are alleged to have DISCHARGED urban storm water containing waste onto the SITE.

RESPONSE TO REQUEST NO. 5:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that it is vague and ambiguous with respect to the term "Storm Drain Outfalls... DISCHARGED." The Cleanup Team further objects to the Request on the ground that NPDES Permit No. CAS0108758 speaks for itself and is the best evidence of its contents with regard to ownership and operation of the various components of the MS4 SYSTEM.

Subject to and without waiving the preceding objections, the Cleanup Team

Cleanup Team Responses to Port RFAs

responds as follows: The Cleanup Team admits that the Port does not own the Storm Drain Outfalls identified as SW4 and SW9 in the CURRENT TCAO and CURRENT DTR. Except as expressly admitted, the Request is denied.

REQUEST FOR ADMISSION NO. 6:

Admit that PERSONS located upgradient from the Port District tidelands have DISCHARGED urban storm water containing waste into the MS4 SYSTEM FACILITIES which was conveyed through the Storm Drain Outfalls identified as SW4 and SW9 in the CURRENT TCAO and CURRENT DTR onto the SITE.

RESPONSE TO REQUEST NO. 6:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to the Request on the ground that NPDES Permit No. CAS0108758 speaks for itself and is the best evidence of its contents with regard to PERSONS who DISCHARGE to the MS4 SYSTEM. The Cleanup Team further objects to this Request as vague and ambiguous with respect to the term "Port District tidelands." The Cleanup Team further objects to this Request as beyond the scope of permissible discovery under the 10.27.10 Order.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Admit.

REQUEST FOR ADMISSION NO. 7:

Admit that for the tidelands and submerged lands in or adjacent to the SITE that the State of California has ultimate authority over the Port District to specify the permitted uses of the SITE, how title to the SITE may be held, and to whom title to the

SITE may revert or be transferred.

RESPONSE TO REQUEST NO. 7.

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request as vague, ambiguous and grammatically unintelligible. The Cleanup Team further objects to this Request on the ground that the term "ultimate authority" is vague and ambiguous. The Cleanup Team further objects to this Request on the ground that the term "ultimate authority" is vague and ambiguous.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: The Cleanup Team lacks information sufficient to form a belief as to: (1) whether the State of California has ultimate authority over the Port District to specify the permitted uses of the SITE; (2) how title to the SITE may be held; (3) to whom title to the SITE may revert; and (4) to whom title to the SITE may be transferred, and based thereon denies this Request.

REQUEST FOR ADMISSION NO. 8:

Admit that the State of California is in effect the equitable and beneficial property owner of the tidelands in or adjacent to the SITE.

RESPONSE TO REQUEST NO. 8:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that the term "is in effect the equitable and beneficial property owner" is vague and

ambiguous. The Cleanup Team further objects to this Request on the ground that the San Diego Unified Port District Act speaks for itself and is the best evidence of its contents.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: The Cleanup Team lacks information sufficient to form a belief as to: (1) whether the State of California is in effect the equitable owner of the tidelands in the SITE; (2) whether the State of California is in effect the equitable owner of the tidelands adjacent to the SITE; (3) whether the State of California is in effect the beneficial owner of the tidelands in the SITE; and (4) whether the State of California is in effect the equitable owner of the tidelands in the SITE; and the site of California is in effect the state of California is in effect the beneficial owner of the tidelands in the SITE; and (4) whether the State of California is in effect the equitable owner of the tidelands adjacent to the SITE, and based thereon denies this Request.

REQUEST FOR ADMISSION NO. 9:

Admit that there were no new facts discovered by YOU between December 2009 and September 2010 to support YOUR revision of the PRIOR TCAO and PRIOR DTR to name the Port District as a DISCHARGER in the CURRENT TCAO and CURRENT DTR.

RESPONSE TO REQUEST NO. 9:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

With respect to naming the Port as a discharger based on its status as an MS4 co-permittee, the Cleanup Team determined after December 2009 that its recommendation to the San Diego Water Board in the PRIOR TCAO and PRIOR DTR

that the Port not be named as a Discharger was inconsistent with previous State Water Resources Control Board and SDRWQCB orders concerning the naming of copermittees in cleanup and abatement orders. With respect to naming the Port as a discharger based on its status as a trustee/landowner, the Cleanup Team determined to change its recommendation to the SDRWQCB from the PRIOR TCAO based on the following facts: (1) In December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by contributing money towards the cost of cleanup, including potential insurance proceeds from its responsible, yet absentee and/or non-participating tenants whose policies name the Port as an additional insured, whereas by the time the CURRENT TCAO was issued, the Port's representatives made it clear it does not intend to do so; (2) Prior to the release of the PRIOR TCAO in December 2009, the Port cooperated with the San Diego Water Board's efforts to clean up the Site by providing expertise to the Cleanup Team regarding scientific and technical issues, whereas by the time the CURRENT TCAO was issued, such cooperation was withdrawn by the Port's representatives; (3) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by identifying and making available (at fair market lease rates) potential sediment staging and dewatering locations, whereas by the time the CURRENT TCAO was issued, the Port's representatives made it clear it will not voluntarily do so; (4) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by designating percipient and expert witnesses to testify in support of the proposed cleanup, whereas on July 19, 2010, the Port's representatives advised the San Diego Water Board that the Port was not designating a single witness to testify in support of the cleanup; (5) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to cleanup up the Site by assisting both financially and technically with California Environmental Quality Act compliance, whereas by the time the CURRENT TCAO was issued, in spite of repeated

requests to the Port's representatives by the Cleanup Team for CEQA assistance, the Port's representatives have refused.

REQUEST FOR ADMISSION NO. 10:

Admit that no changed circumstances or conditions occurred from December 2009 to September 2010 to support YOUR revision of the PRIOR TCAO and PRIOR DTR to name the Port District as a DISCHARGER in the CURRENT TCAO and CURRENT DTR.

RESPONSE TO REQUEST NO. 10:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

With respect to naming the Port as a discharger based on its status as an MS4 co-permittee, the Cleanup Team determined after December 2009 that its recommendation to the San Diego Water Board in the PRIOR TCAO and PRIOR DTR that the Port not be named as a Discharger was inconsistent with previous State Water Resources Control Board and SDRWQCB orders concerning the naming of copermittees in cleanup and abatement orders. With respect to naming the Port as a discharger based on its status as a trustee/landowner, the Cleanup Team determined to change its recommendation to the SDRWQCB from the PRIOR TCAO based on the following changed circumstances: (1) In December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by contributing money towards the cost of cleanup, including potential insurance proceeds from its responsible, yet absentee and/or non-participating tenants whose policies name the Port as an additional insured, whereas by the time the CURRENT

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Cleanup Team Responses to Port RFAs

TCAO was issued, the Port's representatives made it clear it does not intend to do so; (2) Prior to the release of the PRIOR TCAO in December 2009, the Port cooperated with the San Diego Water Board's efforts to clean up the Site by providing expertise to the Cleanup Team regarding scientific and technical issues, whereas by the time the CURRENT TCAO was issued, such cooperation was withdrawn by the Port's representatives; (3) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by identifying and making available (at fair market lease rates) potential sediment staging and dewatering locations, whereas by the time the CURRENT TCAO was issued, the Port's representatives made it clear it will not voluntarily do so; (4) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to clean up the Site by designating percipient and expert witnesses to testify in support of the proposed cleanup, whereas on July 19, 2010, the Port's representatives advised the San Diego Water Board that the Port was not designating a single witness to testify in support of the cleanup; (5) Prior to December 2009, the Cleanup Team believed the Port would cooperate with the San Diego Water Board's efforts to cleanup up the Site by assisting both financially and technically with California Environmental Quality Act compliance, whereas by the time the CURRENT TCAO was issued, in spite of repeated requests to the Port's representatives by the Cleanup Team for CEQA assistance, the Port's representatives have refused.

REQUEST FOR ADMISSION NO. 11:

Admit that in connection with California State Water Resources Control Board Order No. WQ 90-3, *In the Matter of the Petition of San Diego Unified Port District*, YOU advised the State Water Board that the SDRWQCB would take enforcement action against the Port District only as a last resort after the Port had ample opportunity to compel the Port District's tenants to comply with SDRWQCB orders.

RESPONSE TO REQUEST NO. 11:

The Cleanup Team objects to this Request on the ground that it is not full and

complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that the terms "in connection with," "as a last resort" and "ample opportunity" are vague and ambiguous. The Cleanup Team further objects to this Request on the ground that it is irrelevant what the Cleanup Team may have stated to the State Water Resources Control Board regarding its Order No. WQ 90-3 because Order No. WQ 90-3 speaks for itself and is the best evidence of its contents; therefore, the Request is not reasonably calculated to lead to the discovery of admissible evidence.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied. The Cleanup Team never commented to the State Board on the cited Order.

REQUEST FOR ADMISSION NO. 12:

Admit that YOUR determination not to name the Port District as a Discharger in the PRIOR TCAO and PRIOR DTR was consistent with previous California State Water Resources Control Board and SDRWQCB orders concerning the naming of nonoperating public agencies in cleanup and abatement orders.

RESPONSE TO REQUEST NO. 12:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: The Cleanup Team admits that its recommendation to the San Diego Water Board in the PRIOR TCAO and PRIOR DTR that it not name the Port as a

discharger was consistent with previous California State Water Resources Control Board and SDRWQCB orders concerning the naming of non-operating public agency landowners in cleanup and abatement orders based on the facts known to the Cleanup Team as of December 22, 2009. Except as expressly admitted, the Request is denied. The Cleanup Team's recommendation to the San Diego Water Board in the PRIOR TCAO and PRIOR DTR that the Port not be named as a Discharger was inconsistent with previous State Water Resources Control Board and SDRWQCB order concerning the naming of co-permittees in cleanup and abatement orders.

REQUEST FOR ADMISSION NO. 13:

Admit that YOUR determination to name Port District as a Discharger in the CURRENT TCAO and CURRENT DTR is inconsistent with previous California State Water Resources Control Board and SDRWQCB orders concerning the naming of nonoperating public agencies in cleanup and abatement orders.

RESPONSE TO REQUEST NO. 13:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

New facts and circumstances developed between December 22, 2009, and September 15, 2010 that made the Cleanup Team's previous recommendation inconsistent with previous California State Water Resources Control Board and SDRWQCB orders concerning the naming of non-operating public agency landowners in cleanup and abatement orders. The facts and circumstances are detailed in the Cleanup Team's responses to Request Nos. 9 and 10. Additionally, naming the Port as

a Discharger based on its status as a co-permittee under NPDES Permit No. CAS0108758 is consistent with previous State Water Resources Control Board and SDRWQCB orders.

REQUEST FOR ADMISSION NO. 14:

Admit that YOU do not allege in the CURRENT TCAO and CURRENT DTR that any of Port District's TENANTS at the SITE DISCHARGED waste into the SITE in violation of any of the TENANTS' applicable waste discharge permit requirements that were issued by YOU since February 1963.

RESPONSE TO REQUEST NO. 14:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

It is a violation of each and all of the applicable permits of the Port's TENANTS, as well as the Port's MS4 permit, to cause or permit, or threaten to cause or permit waste to be discharged or deposited where it is, or probably will be, discharged into waters of the state and creates, or threatens to create, a condition of pollution or nuisance.

REQUEST FOR ADMISSION NO. 15:

Admit that Campbell Industries, Inc., is the corporate successor of former SITE TENANT San Diego Marine Construction Corporation, formerly known as MCCSD. <u>REPONSE TO REQUEST NO. 15:</u>

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060,

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Cleanup Team Responses to Port RFAs

subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground the term "corporate successor" is vague and ambiguous.

Subject to and without waiving the preceding objection, the Cleanup Team responds as follows: The Cleanup Team admits that Campbell Industries is legally responsible for the acts and omissions of former SITE TENANT San Diego Marine Construction Corporation, also known as MCCSD, from June 23, 1972 through 1979, when it operated a shipyard at what is now known as the BAE leasehold.

REQUEST FOR ADMISSION NO. 16:

Admit that San Diego Marine Construction Corporation, a wholly owned subsidiary of Campbell Industries, Inc., is the corporate successor of San Diego Marine Construction Company's marine division's shipyard operations.

RESPONSE TO REQUEST NO. 16:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground the terms "corporate successor" and "marine division's shipyard operations" are vague and ambiguous.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Admit that San Diego Marine Construction Corporation was a wholly owned subsidiary of Campbell Industries. Except as expressly admitted, the Request is denied.

San Diego Marine Construction Corporation purchased the assets of what appears to be known as the "marine division" of the San Diego Marine Construction

Cleanup Team Responses to Port RFAs

Company.

REQUEST FOR ADMISSION NO. 17:

Admit that the Port District's TENANT Star & Crescent Boat Company, is the corporate successor of the operations of San Diego Marine Construction Company's boat division known as Star and Crescent Boat Company.

RESPONSE TO REQUEST NO. 17:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground the term "corporate successor of the operations" is vague and ambiguous.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Admit.

REQUEST FOR ADMISSION NO. 18:

Admit that YOU are responsible for issuing permits regulating the discharge of storm water and other discharge point sources onto the SITE.

RESPONSE TO REQUEST NO. 18:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that the term "other discharge point sources" is vague and ambiguous.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: While the Cleanup Team is not responsible for issuing permits, it admits that the SDRWQCB is responsible for issuing permits regulating the discharge of

storm water and other pollutants from point sources to waters of the state, including those waters at the SITE.

REQUEST FOR ADMISSION NO. 19:

Admit that YOU issued permits to the Port District's TENANTS, who are currently leasing the tidelands in or adjacent to the SITE, including San Diego Gas & Electric Company, National Steel and Shipbuilding Company, and BAE Systems San Diego Ship Repair, Inc., regulating the TENANTS' storm and waste water DISCHARGES onto the SITE.

RESPONSE TO REQUEST NO. 19:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f). The Cleanup Team further objects to this Request on the ground that the term "regulating the TENANTS' storm and waste water DISCHARGES onto the SITE" is vague and ambiguous and that the referenced permits speak for themselves and are the best evidence of their contents.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: While the Cleanup Team did not issue permits, it admits that the SDRWQCB issued permits to the referenced TENANTS, which permits speak for themselves and are the best evidence of their contents.

REQUEST FOR ADMISSION NO. 20:

Admit that YOU issued storm and waste water DISCHARGE permits to the Port District's TENANTS, who are currently leasing the tidelands in or adjacent to the SITE, including San Diego Gas & Electric Company, National Steel and Shipbuilding Company, and BAE Systems San Diego Ship Repair, Inc., that contained water quality based effluent limitations which permitted the TENANTS to DISCHARGE waste onto

Cleanup Team Responses to Port RFAs

the SITE that contained certain levels of contaminants of concern that are identified in the CURRENT TCAO and CURRENT DTR, including, but not limited to, chromium, copper, nickel, and zinc.

RESPONSE TO REQUEST NO. 20:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: While the Cleanup Team did not issue permits, it admits that the SDRWQCB issued some permits to some of the TENANTS referenced in the Request that contain water quality based effluent limitations for chromium copper, nickel and zinc, while other issued permits to the TENANTS referenced in the Request are BMP based.

REQUEST FOR ADMISSION NO. 21:

Admit that the storm and waste water DISCHARGES that YOU permitted the Port District's TENANTS, who are currently leasing the tidelands in or adjacent to the SITE, including San Diego Gas & Electric Company, National Steel and Shipbuilding Company, and BAE Systems San Diego Ship Repair, Inc., to DISCHARGE onto the SITE contained waste that contributed to the alleged contamination of the sediment at the SITE.

RESPONSE TO REQUEST NO. 21:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060,

subdivision (f). The Cleanup Team further objects to the Request on the ground that it is vague, ambiguous and grammatically unintelligible.

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

The Cleanup Team does not permit DISCHARGES. While the SDRWQCB issues permits that allow certain DISCHARGES, it is a violation of each and all of the applicable permits of the Port's TENANTS, as well as the Port's MS4 permit, to cause or permit, or threaten to cause or permit waste to be discharged or deposited where it is, or probably will be, discharged into waters of the state and creates, or threatens to create, a condition of pollution or nuisance.

REQUEST FOR ADMISSION NO. 22:

Admit that the Port District does not have authority to impose more stringent requirements on its TENANTS' storm water discharges than those imposed by YOU. **RESPONSE TO REQUEST NO. 22:**

The Cleanup Team objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objection, the Cleanup Team responds as follows: Denied.

The Cleanup Team does not impose requirements on storm water discharges. The Cleanup Team lacks information sufficient to form a belief about the scope of the Port's authority as a special government agency that holds and manages land in trust for the People of the State, or as a lessor engaged in a commercial transaction with its lessees, to impose requirements on its TENANTS storm water discharges, and based thereon denies this Request.

REQUEST FOR ADMISSION NO. 23:

Admit that the Port District has never been cited by YOU for violating the terms of the current or prior MS4 SYSTEM permits YOU issued to the Port District and the other

MS4 SYSTEM co-permitees RELATING TO DISCHARGES onto the SITE. **RESPONSE TO REQUEST NO. 23:**

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Admit.

REQUEST FOR ADMISSION NO. 24:

Admit that the Port District did not have knowledge of all of the waste DISCHARGES into the SITE, since February 1963, for which YOU seek to hold it primarily liable.

RESPONSE TO REQUEST NO. 24:

The Cleanup Team objects to this Request on the ground that it is not full and complete in and of itself, in violation of Code of Civil Procedure section 2033.060, subdivision (d). The Cleanup Team further objects to this Request as compound, conjunctive, and/or disjunctive in violation of Code of Civil Procedure section 2033.060, subdivision (f).

Subject to and without waiving the preceding objections, the Cleanup Team responds as follows: Denied.

The Port has sufficient knowledge of the activities of its TENANTS, which are controlled by the terms of its leases with those TENANTS, and the mechanics and operations of the MS4 SYSTEM of which it is a co-permittee, to name it as a Discharger. Dated: January 5, 2010

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, CLEANUP TEAM

By: Christian Carrigan

SAN DIEGO UNIFIED PORT DISTRICT WRITTEN DISCOVERY RESPONSE VERIFICATION

I, David Barker, declare:

7.

I am the Branch Chief of the Surface Waters Basins Branch and a Supervising Water Resource Control Engineer at the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board). I am the designated manager of the Cleanup Team for the San Diego Water Board's proceedings to consider the development and issuance of a cleanup and abatement order for discharges of metals and other pollutant wastes to San Diego Bay marine sediments and waters at a Site referred to as the Shipyard Sediment Site. I am authorized to make this verification on behalf of the San Diego Water Board's Cleanup Team.

I have read the foregoing Regional Board Cleanup Team's Responses & Objections to Designated Party San Diego Unified Port District's First Set of Requests for Admissions, Regional Board Cleanup Team's Responses & Objections to Designated Party San Diego Unified Port District's First Set of Requests for Production of Documents and Regional Board Cleanup Team's Responses & Objections to Designated Party San Diego Unified Port District's First Set of Special Interrogatories, and know their contents. I am informed and believe that the matters stated therein are true and on that ground certify or declare under penalty of perjury under the laws of the State of California that the same are true and correct.

Dated: January 5, 2011

David Banks

David Barker

Cleanup Team's Verification of Discovery Responses to San Diego Unified Port District

1 2 3 4	JILL A. TRACY (State Bar No. 182136)101 Ash Street, 12^{th} FloorSan Diego, CA 92101Telephone: (619) 699-5112Facsimile: (619) 696-4488	
5 6 7 8 9	Los Angeles, California 90071 Telephone: (213) 576-1000 Facsimile: (213) 576-1100)
10	Attorneys for Designated Party	
11	SAN DIEGO GAS & ELECTRIC COMPANY	
12	CALIFORNIA REGIONAL WATEI	R QUALITY CONTROL BOARD
13	SAN DIEGC	이 동작을 위한 물건의 사람이 많이 많이 있다.
14		
15	IN THE MATTER OF:	SAN DIEGO GAS & ELECTRIC
• 16	TENTATIVE CLEANUP AND	COMPANY'S NOTICE OF JOINDER IN NASSCO'S SECOND AMENDED
17	ABATEMENT ORDER NO. R9-2011-0001	NOTICE OF VIDEOTAPED DEPOSITION OF CRAIG CARLISLE
18		Date: February 9-10, 2011
19 20		Time: 9:00 a.m. Place: Latham & Watkins LLP 600 West Broadway, Suite 1800 San Diego, CA 92101
21		Ban Diego, CA 72101
22		
- 23		EXHIBIT NO. 1003
24		<u>Carliste</u> 2/9/11
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TO ALL PARTIES AND THEIR COUNSEL OF RECORD:

PLEASE TAKE NOTICE that San Diego Gas & Electric Company ("SDG&E") hereby joins 3 the Second Amended Notice of Videotaped Deposition of Craig Carlisle ("Amended Notice"), served by National Steel and Shipbuilding Company ("NASSCO") on January 24, 2011, scheduled to take place on February 9 and 10, 2011, at 9:00 a.m., at the law offices of Latham & Watkins LLP, 600 West Broadway, Suite 1800, San Diego, California, 92101, upon oral examination before a Certified Shorthand Reporter duly authorized to administer oaths, and continuing from day to day, weekends and holidays excluded, until completed.

9 SDG&E incorporates the provisions of NASSCO's Amended Notice as though fully set forth 10 herein, including, without limitation, each of the definitions and document requests described in the 11 Amended Notice. SDG&E reserves the right to examine the witness on all matters relevant to this 12 proceeding, until completion, and to use any videotaped portion of the deposition testimony at any 13 subsequent hearing in this matter.

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Dated: January 26, 2011

OFFICE OF THE GENERAL COUNSEL

By:

Jill A. Tracy Attorneys for Designated Party SAN DIEGO GAS & ELECTRIC COMPANY

1003.2

SDG&E'S NOTICE OF JOINDER IN SECOND AMENDED NOTICE OF DEPOSITION OF CRAIG CARLISLE

1004 J

E^xponent[®]

NASSCO and Southwest Marine Detailed Sediment Investigation

Volume I

Prepared for

NASSCO and Southwest Marine San Diego, California

0	хнівіт NO. <u>1004</u>
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SAR105417

E^xponent^{*}

NASSCO and Southwest Marine Detailed Sediment Investigation

Volume I

Prepared for

NASSCO and Southwest Marine San Diego, CA 92113

Prepared by

Exponent 15375 SE 30th Place, Suite 250 Bellevue, WA 98007

October 2003

Doc. no. 8601718.002 1201 0903 DN05

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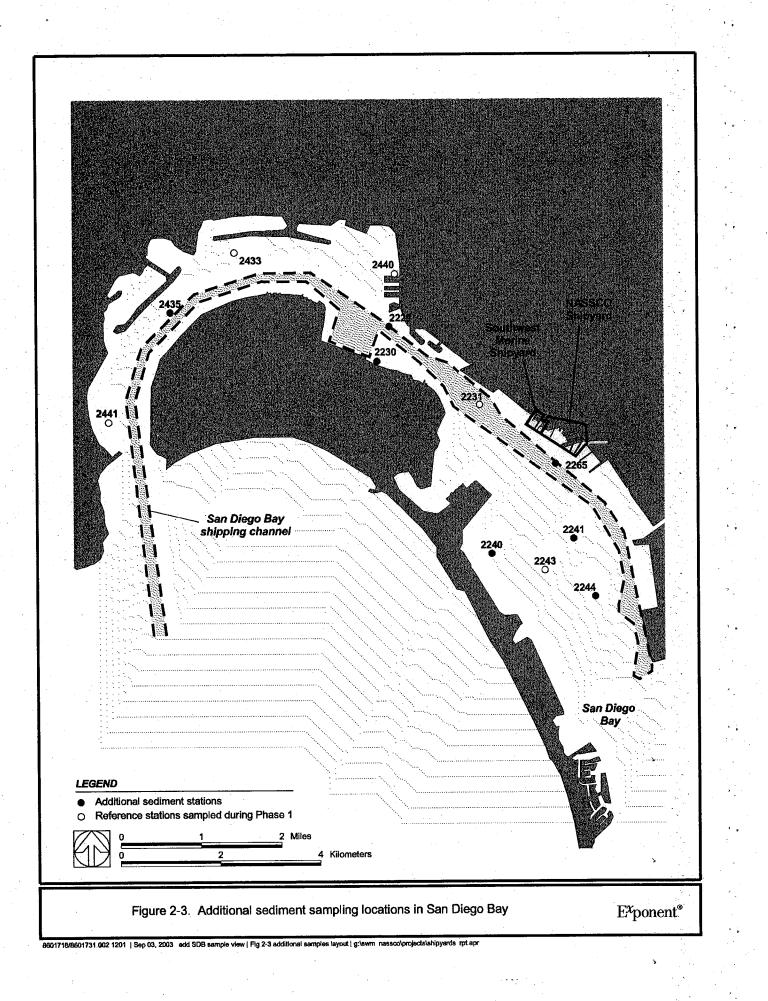
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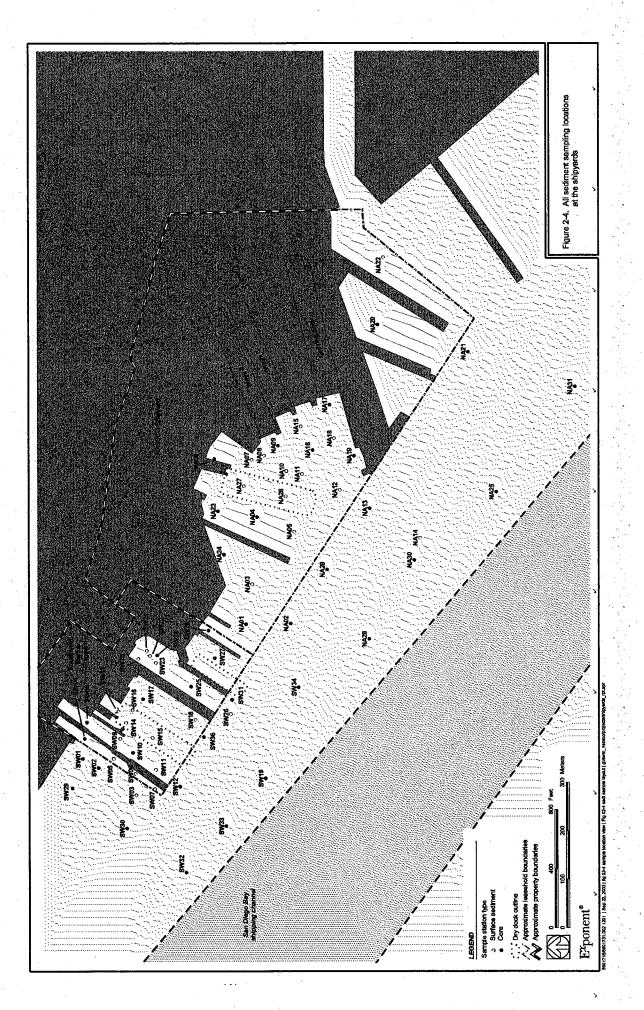
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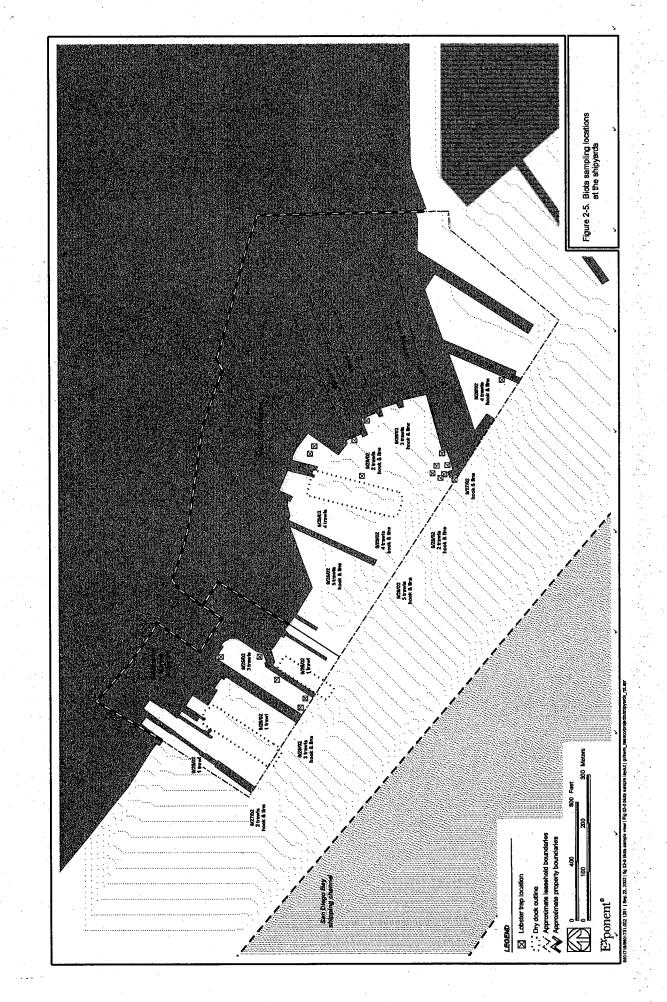
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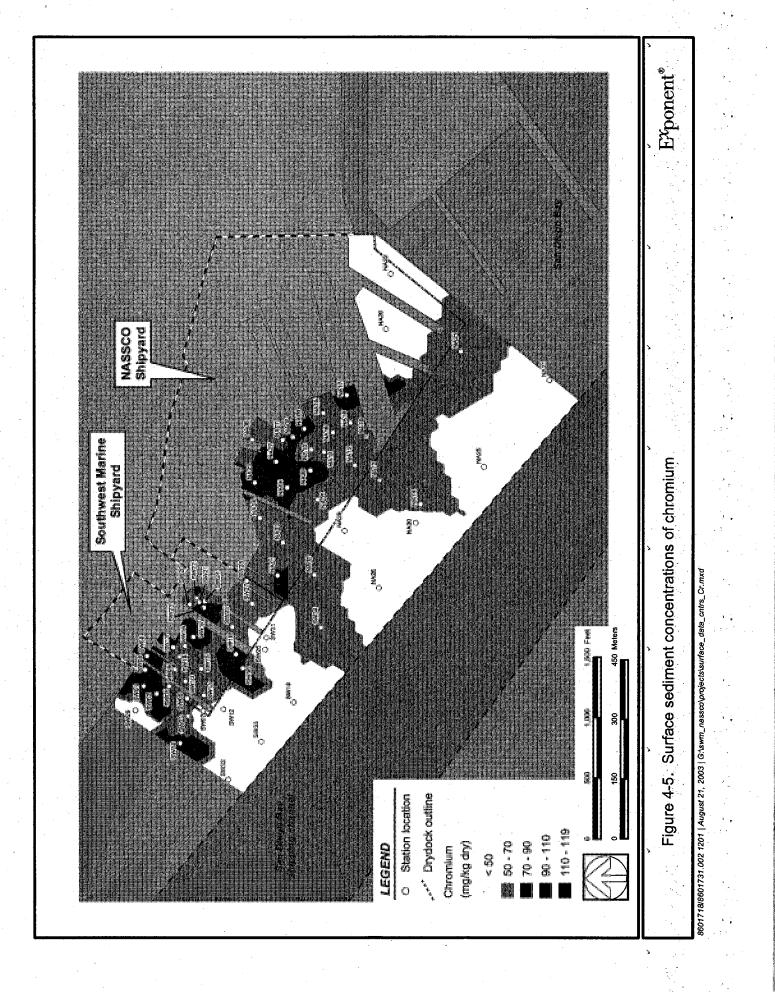
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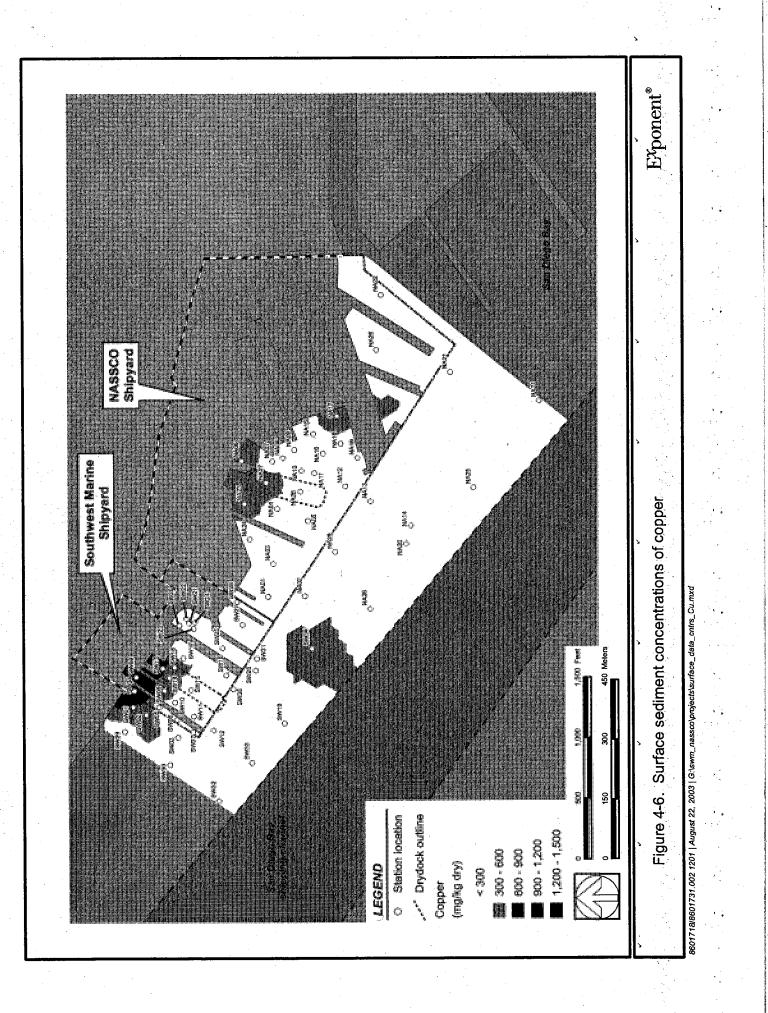


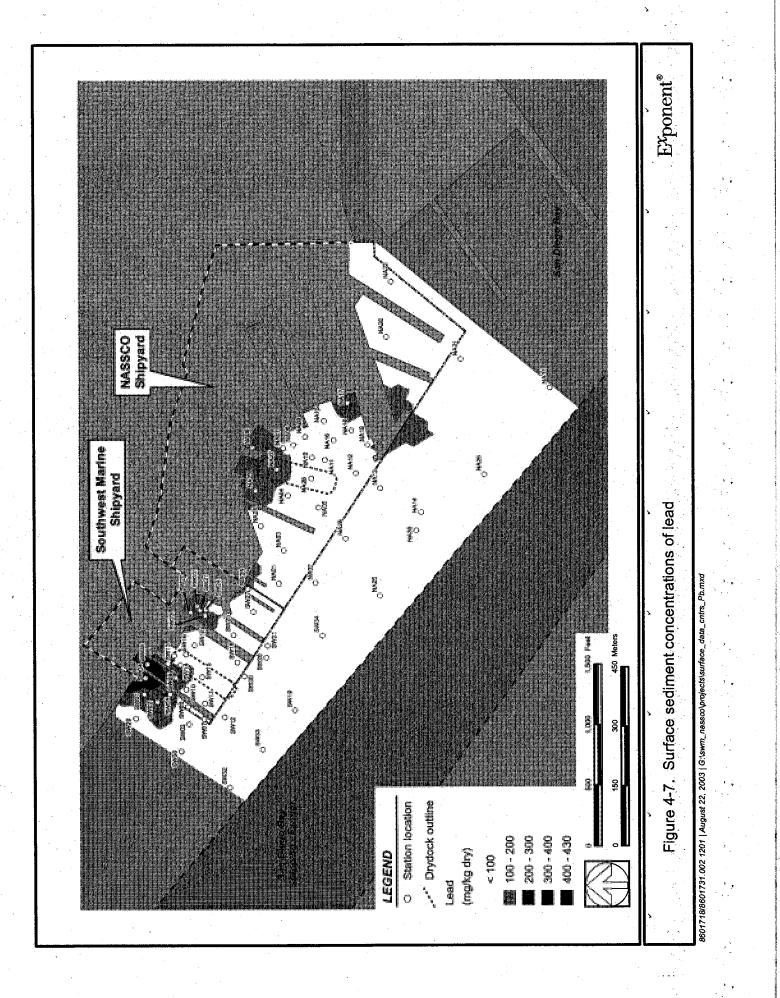
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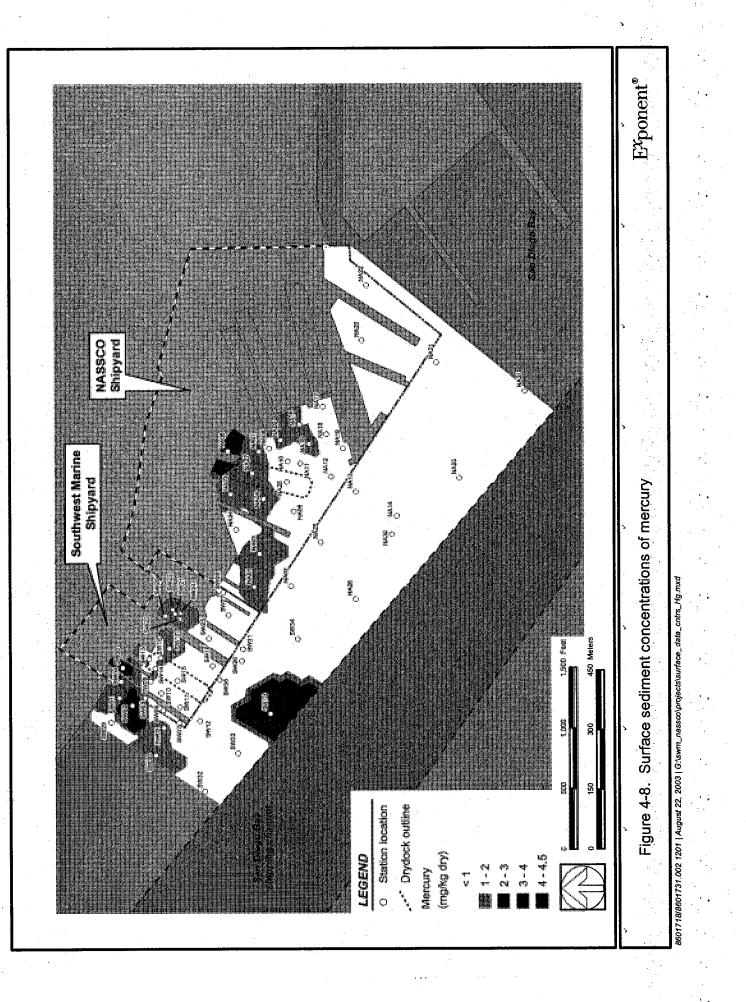


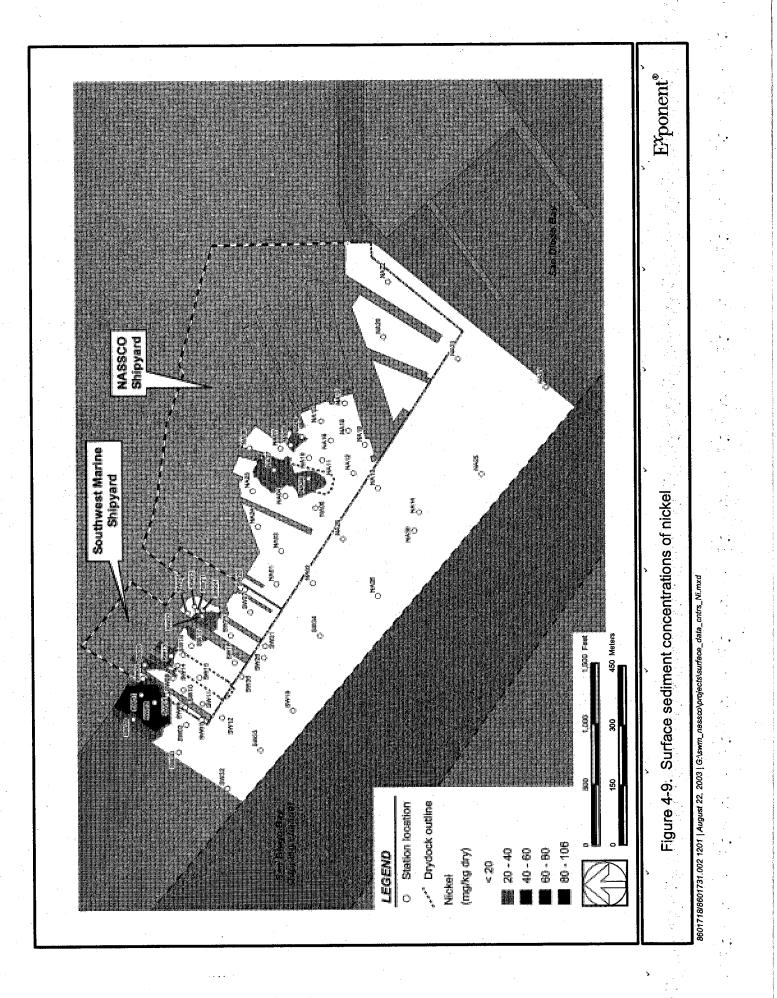


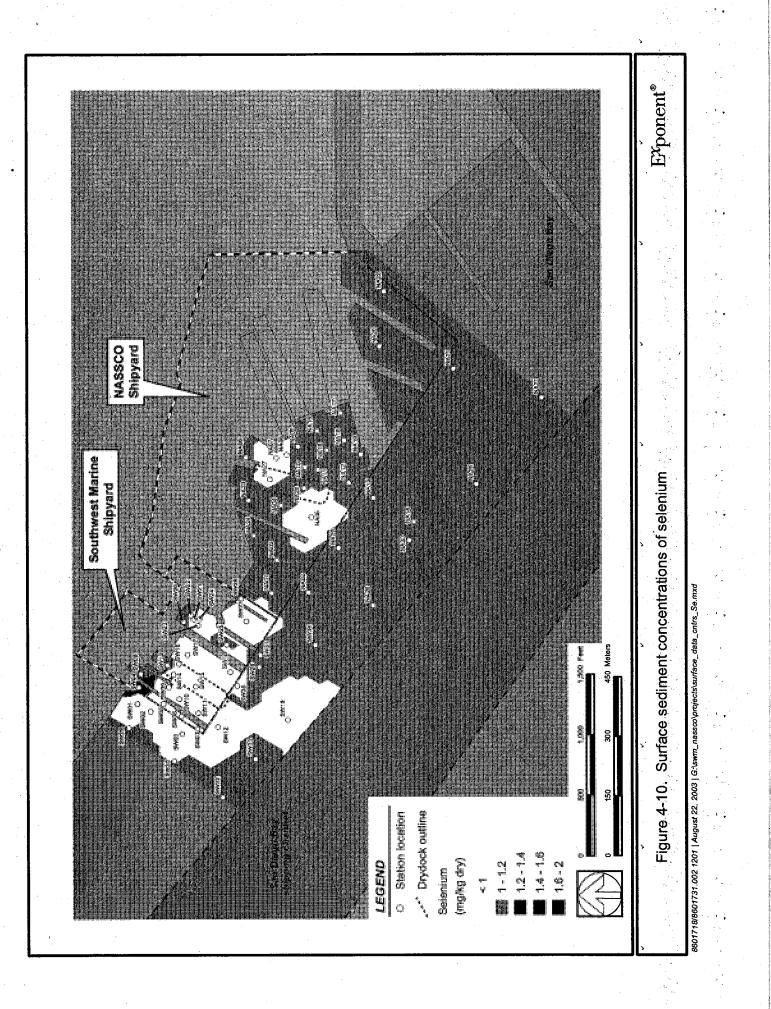


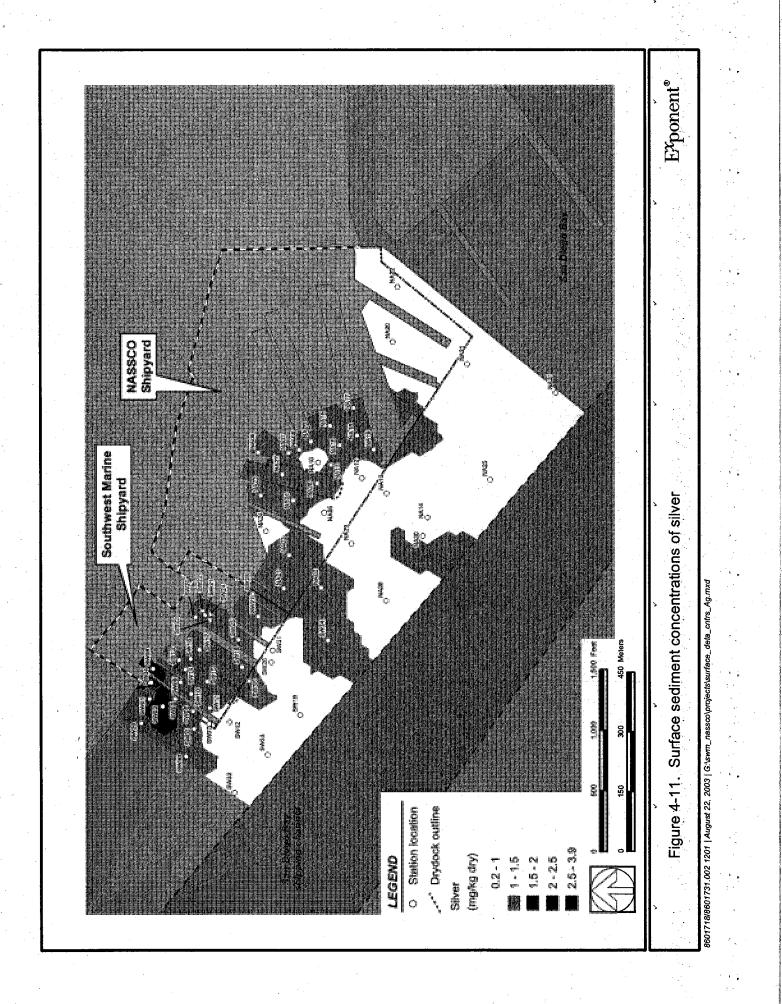


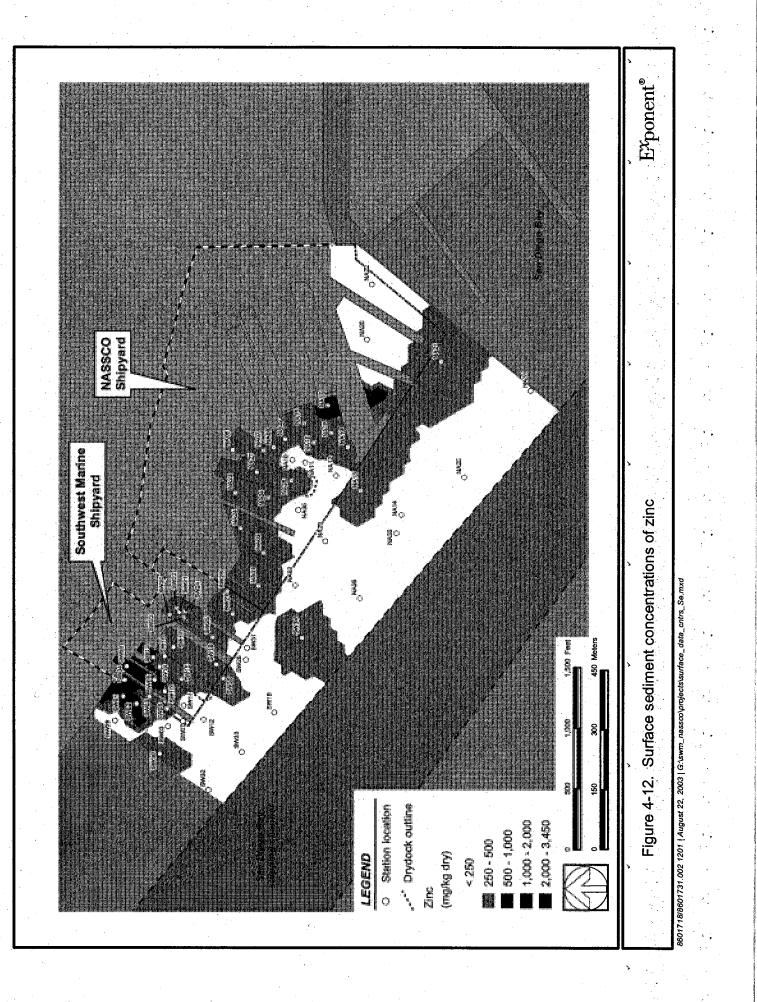
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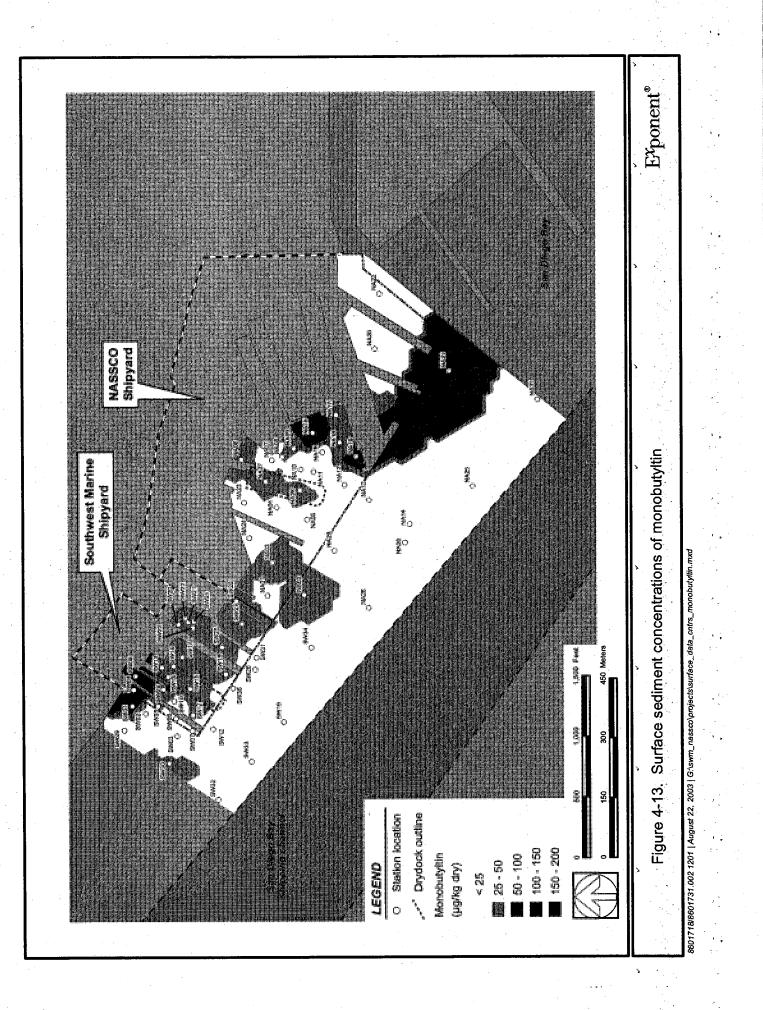


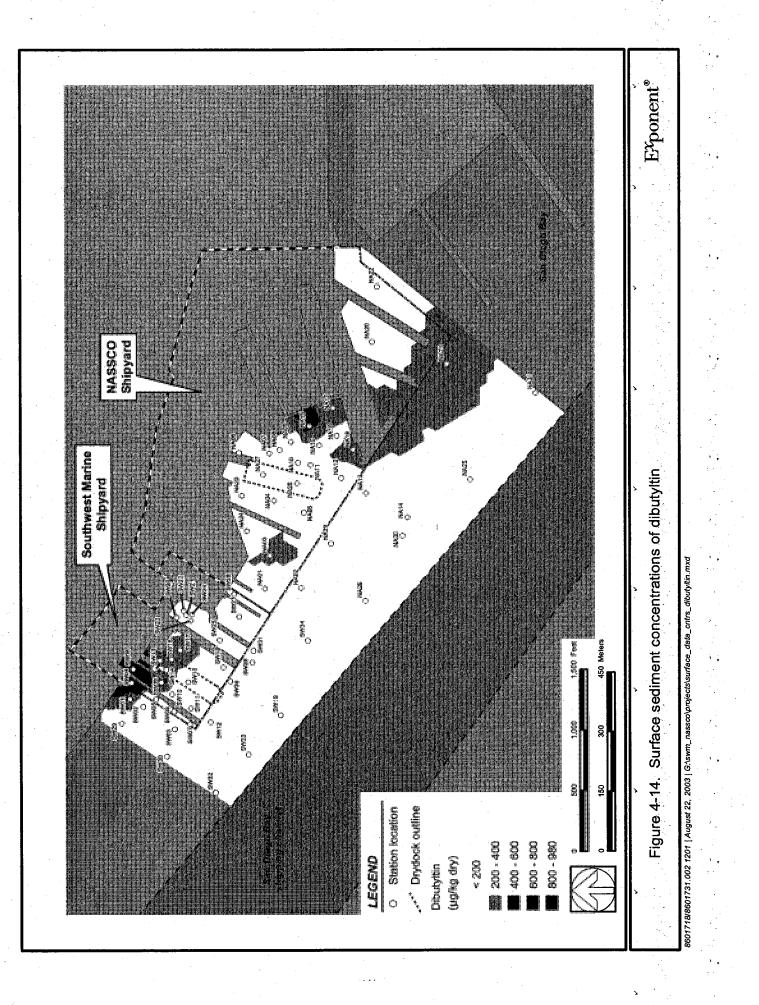


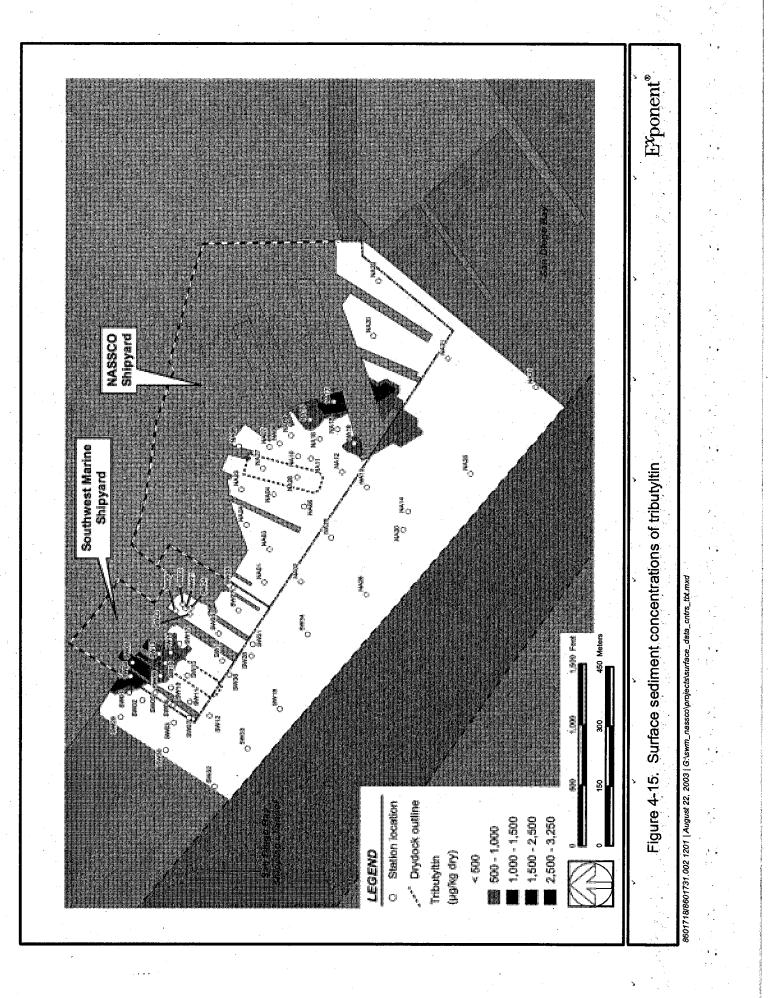


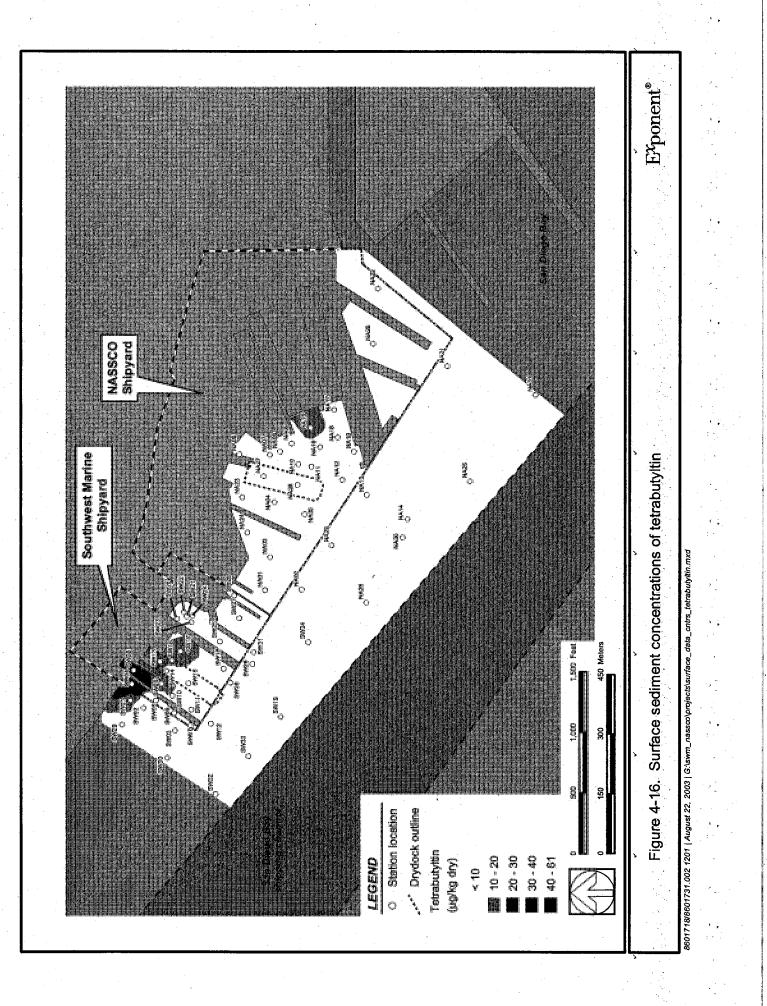


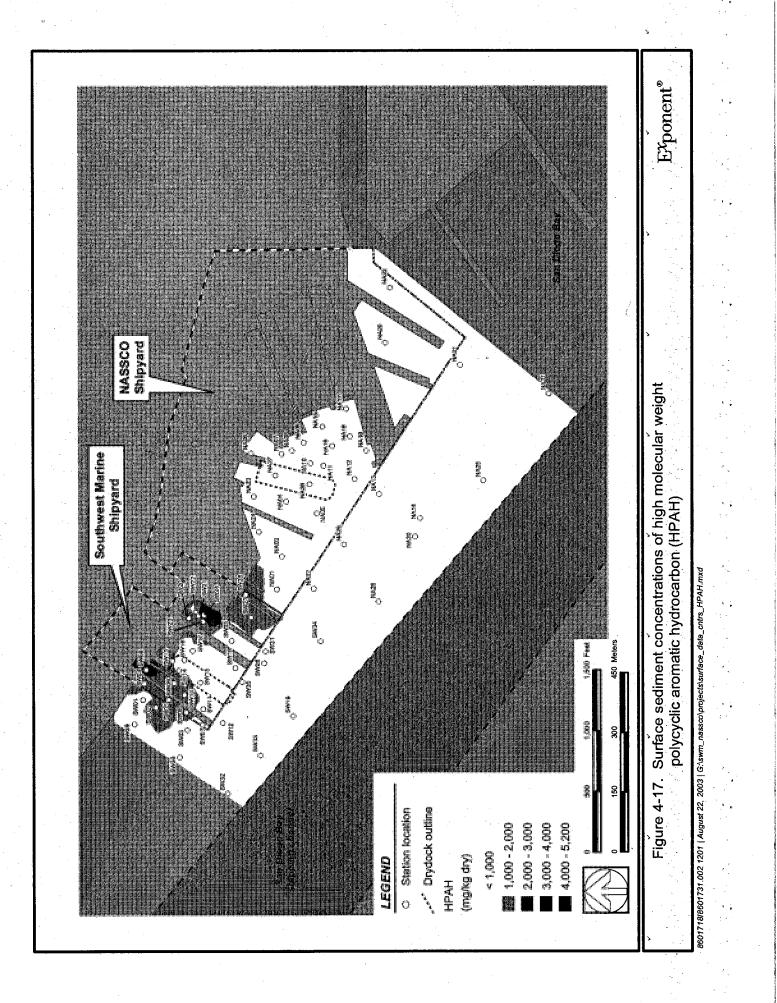




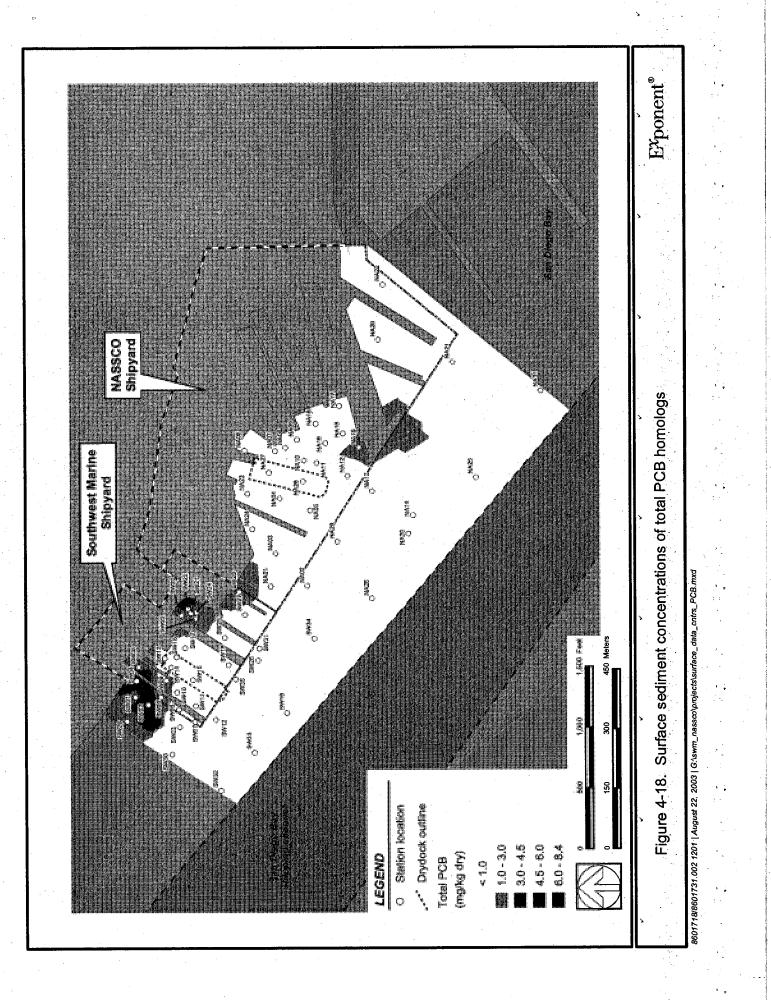


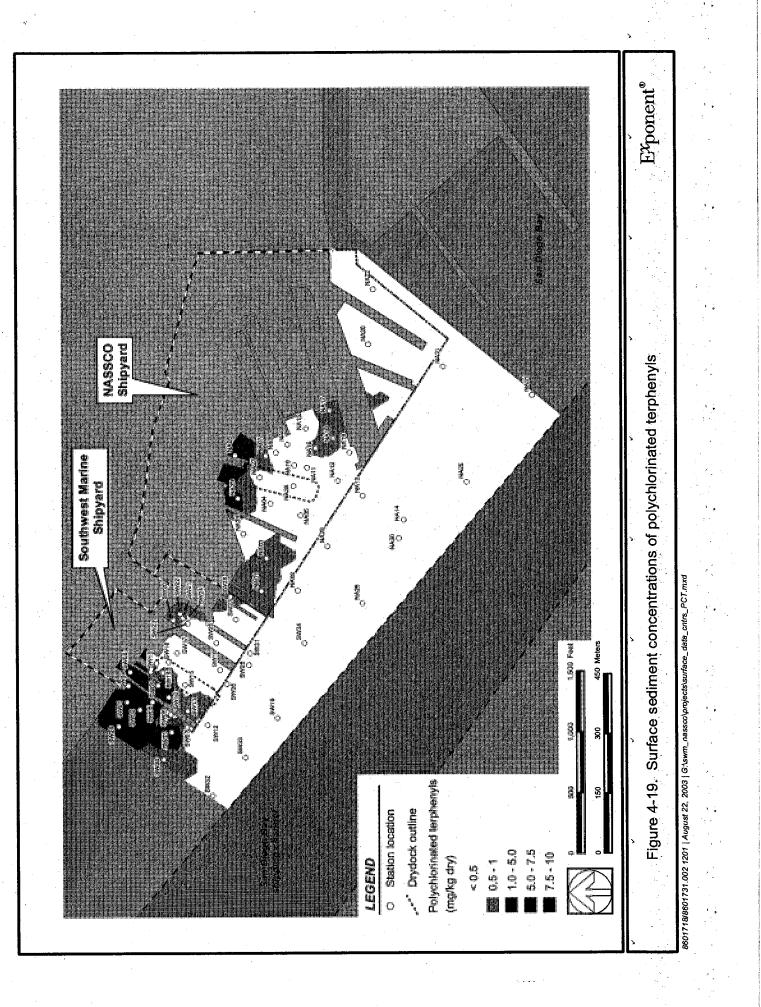


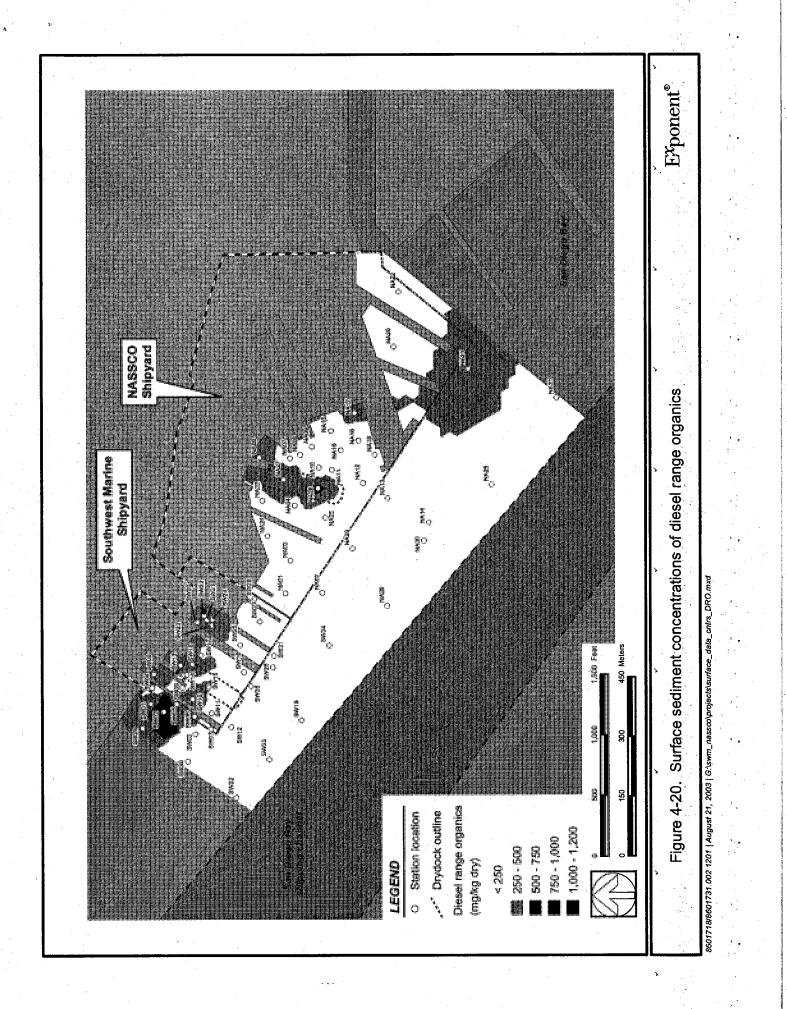


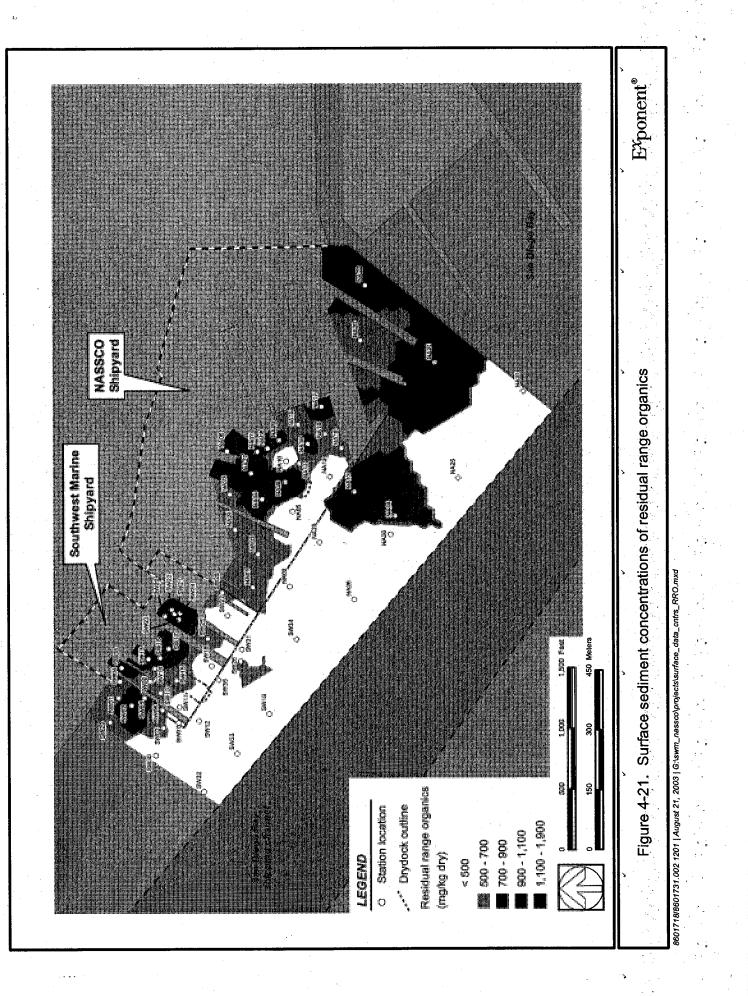


SAR105809









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Exponent

NASSCO and Southwest Marine Detailed Sediment Investigation

Volume II Appendices A–E

Prepared for

NASSCO and Southwest Marine San Diego, California



Volume II

Appendix A Sediment Profile Images and Data Summary

Appendix B Surface and Subsurface Sediment Chemistry Data

- Appendix C Sediment Core Logs
- Appendix D Pore Water Chemistry Data
- Appendix E Tissue Chemistry Data

Table B1-7. PCB and PCT results for surface sediment samples

	Samole		Field				PCB Aroc	Aroclors®					PCT A	Aroclors®	
Station	Number	Date	Split	1016	1221	1232	1242	1248	1254	1260	Total ^a	5432	5442	5460	Total ^a
Reference									00	Ċ	2			10	75 11
		09/09/2002		15 U		15 U			32	32	04 00		2 : 0		
_		09/09/2002		15 U		15 U			1/	19	99 99		ר כן הייני	ה הי ה הי	n 6/
		08/08/2001		10 U		10 0			240	140	380		48 U	240 U	240 U
-	SD0134	09/14/2002		26 U	52 U	26 U	26 U	26 C	99	/8/	150	70 GZ	70 N	061	061
_	SD0125	09/12/2002		25 U		D 97			53	50	130		0 07	140	140 60 22
	SD0128	09/12/2002				14 U			14 U	18	18		14 0	08 U	08 U
2243	SD0049	08/14/2001		16 U		16 U			23	16 U	53		31 U	160 U	160 U
2243	SD0124	09/12/2002		16 U		16 U			27	29	56		16 U	85	85
2244	SD0126	09/12/2002	-	8.1 U		8.1 U			23	30	53		17 U	81 U	81 U
2244	SD0127	09/12/2002	2	16 U		16 U			21	29	50		16 U	78 U	78 U
2265	SD0107	09/09/2002		18 U		18 U			51	50	100		18 U	86 U	86 U
	SD0041	08/12/2001		16 U		16 U			26	17	43		32 U	160 U	160 U
2433	SD0130	09/13/20:02		17 U		17 U			32	34	66		17 U	95	95
	SD0102	09/09/2002		14 U		14 U			14 U	14 U	28 U		14 U	70 U	70 U
	SD0043	08/13/2001		17 U		17 U			190	88	280		33 U	170 <i>U</i>	170 U
2440	SD0131	09/13/2002		17 U		17 U			140	110	250.		17 U	560	560
2441	SD0034	08/11/2001		18 U		18 <i>U</i>			20	18 U	20		36 U	180 <i>U</i>	180 U
2441	SD0123	09/12/2002		20 U		20 U			26	20 U	26		20 U	<i>N</i> 66	D 66
NASSCO															
NA01	SD0030	08/11/2001	-	28 U				28 U	370	260	630	56 U	56 U	640	640
NA01	SD0031	08/11/2001	2	29 U				29 U	360	220	580	57 U	57 U	570	570
NA02	SD0033	08/11/2001		29 U				29 U	150	140	290		58 U	290 U	290 U
NA03	SD0032	08/11/2001		29 U				29 U .	330	250	580		58 U	540	540
NA04	SD0035	08/11/2001		30 U				30 U	250	180	430		59 U	390	390
NA05	SD0044	08/13/2001		24 U				24 U	140	96	240		47 U	240 U	240 U
NA06	SD0020	08/09/2001		280 U	550 U	280 U	280 U	280 U	1,400	290 J	1,700 J	550 U	550 U	2,900	2,900
NA07	SD0017	08/08/2001	۴	270 U				270 U	490	270 U	490		54 U	750	750
NA07	SD0018	08/08/2001	2	270 U				570 JN	590	270 U	1,200 JN			500	500
NA08	SD0055	08/14/2001		32 U				32 U	210	170	380		64 U	330	330
NA09	SD0054	08/14/2001		33 U				33 U	230	180	410			330 U	330 U
NA10	SD0056	08/14/2001		22 U				22 U	170	130	300			270	270
NA11	SD0021	08/09/2001		26 U				26 U	170	100	270			340	340
NA12	SD0027	08/10/2001		25 U				25 U	120	95	220			250 U	250 U
NA13	SD0036	08/11/2001		28 U				28 U	130	110	240			280 U	280 U
NA14	SD0051	08/14/2001		23 U				23 U	120	93	210			230 U	230 U
NA15	SD0037	08/12/2001		27 U				27 U	320	160	480	53 U		340	340
NA16	SD0038	08/12/2001		28 U				28 U	450	210	660	56 U		570	570
NA17	SD0039	08/12/2001		29 U	58 U			29 U	640	310	950	58 U		650	650
NA18	SD0053	08/14/2001		27 U	53 U			27 U	590	280	.870	53 U	53 U	840	840

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(cont.)
B1-7.
Table

Sa	Samole		Field				PCB Aroclors®	dors®					PCT A	Aroclors®	
Station Nu	Number	Date	Split	1016	1221	1232	1242	1248	1254	1260	Total ^a	5432	5442	5460	Total ^a
NA19	SD0042 (08/12/2001		28 U	56 U	28 U	28 U	28 U	430	170	600	56 U	56 U	280 U	280 U
NA20 SD	SD0028 (08/10/2001		19 U	37 U	19 U	19 U	19 U	120	11	200	37 U	37 U	190 U	190 U
NA21 SD	SD0050 (08/14/2001		23 U	46 U	23 U	23 U	23 U	150	120	270	46 U	46 U	230 U	230 U
NA22 SD	SD0052 (08/14/2001		20 U	39 U	.20 <i>U</i>	20 U	20 U	200	150	350	39 U	39 U	200 U	200 U
NA23 SD		09/08/2002		28 U	56 U	28 U	28 U	28 U	600 J	530 J	1,100 J	28 U	28 U	1,000 J	1,000 J
NA24 SD	SD0094 (09/08/2002		25 U	50 U	25 U	25 U	25 U	260	270	530	25 U	25 U	350	350
NA25 SD	SD0106 (09/09/2002		21 U	41 U	21 U	21 U	21 U	87	96	180	21 U	21 U	150	150
NA26 SD	SD0116 (09/11/2002		22 U	44 U	22 U	22 U	22 U	82	110	190	22 U	22 U	190	190
NA27 SD	SD0301 1	10/02/2002		20 U	39 U	20 U	20 U	20 U	270	340	610	39 U	39 U	480	480
NA28 SD	SD0300 1	10/02/2002		18 U	36 U	18 U	18 U	18 U	290	340	630	36 U	36 U	550	550
NA29 SD	SD0119 (09/11/2002		25 U	49 U	25 U	25 U	25 U	160	170	330	25 U	25 U	400	400
NA30 SD	SD0115 (09/11/2002		22 U	43 U	22 U	22 U	22 U	220	160	380	22 U	22.U	170	170
NA31 SD	SD0105 (09/09/2002		20 U	40 U	20 U	20 U	20 U	85	83	170	20 U	20 U	100	100
Southwest Marine	ЭГ														
SW01 SD		08/06/2001		340 U	680 U	340 U	340 U	340 U	5,900	1,200	7,100	680 U	680 U	9,800	9,800
-	SD0005 (08/06/2001	-	480 U	096 N	480 U	480. U	480 U	5,500	1,300	6,800	D 096	, U 096	13,000	13,000
SW02 SD	SD0006 (08/06/2001	2	530 U	1,100 U	530 U	530 U	530 U	4,700	1,100	5,800	1,100 U	1,100 U	7,700	7,700
SW03 SD	SD0009 (08/07/2001		270 U	530 U	270 U	270 U	270 U	780	270 U	780	270 U	270 U	1,800	1,800
SW04 SD	SD0012 (08/07/2001		1 <u>90</u> U	370 U	190 U	190 U	190. U	2,400	600	3,000	190 U	190 U	4,800 J	4,800 J
SW05 SD	SD0003 (08/06/2001		110 U	210 U	110 U	110 U	110 U	1,500	390	1,900	210 U	210 · <i>U</i>	2,700	2,700
SW06 SD	SD0002 (08/06/2001		140 U	280 U	140 U	140 U	350	530	200	1,100	56 U	56 U	310	310
SW07 SD	SD0004 (08/06/2001		110 U	220 U	110 U	110 U	110 U	230	110 U	230	44 U	44 U	390	390
SW08 SD	SD0016 (08/08/2001		330 U	650 U	330 U	330 U	N/ 066	2,400	640	4,000 JN	650 U	650 U	5,900	5,900
DS 60MS	SD0007 (08/06/2001		120 U	230 U	120 U	120 U	120 U	1,100	410	1,500	230 U	230 U	1,400	1.400
SW10 SD	_	08/06/2001		95 U	190 U	95 U	95 U	580	710	220	1,500	190 U	190 U	1,300	1,300
SW11 SD	_	08/13/2001		27 U	53 U	27 U	27 U	27 U	460	170	630	53 U	53 U	910	910
-	_	08/07/2001		23 U	45 U	23 U	23 U	23 U	220	110	330	45 U	45 U	320	320
	-	08/09/2001		30 U	60 U	30 <i>U</i>	30 U	30 U	310	210	520	60 U	00 U	350	350
	-	08/10/2001		26 U	52 U	26 U	26 U	26 U	360	260	620	52 U	52 U	640	640
		08/10/2001		29 U	58 U	29 U	29 U	29 U	240	160	400	58 U	58 U	350	350
		08/10/2001		24 U	47 U	24 U	24 U	24 U	340	250	590	47 U	47 .U	410	410
SW17 SD		08/13/2001		30 U	59 U	30 U	30 U	30 U	390	420	810	59 U	59 U	320	320
SW18 SD		08/13/2001		30 U	59 U	30 U	30 U	30 U	250	130	380	59 U	59 U	300 U	300 U
SW19 SD	SD0011 (08/07/2001		21 U	41 U	21 U	21 U	21 U	110	95	210	41 U	41 U	240	240
SW20 SD	SD0059 (08/15/2001		250 U	200 U	250 U	250 U	250 U	1,500	1,600	3,100	50 U	50 U	640	640
SW21 SD	_	08/09/2001		260 U	520 U	260 U	260 U	260 U	1,600	1,800	3,400	52 U	52 U	760	760
SW22 SD	SD0060 (08/15/2001		29 U	57 U	29 U	29 U	29 U	670	290	1,500	57 U	57 U	540	540
SW23 SD		08/15/2001		29 U	58 U	29 U	29 U	29 U	550	7.10	1,300	58 U	58 U	370	370
		08/08/2001		230 U	460 U	230 U	230 U	230 U	790	870	1,700	46 U	46 U	630	630
SW25 SD	SD0057 (08/15/2001		26 U	51 U	26 U	26 U	26 U	330	380	710	51 U	51 U	310	310

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Table B1-7. (cont.)

Field				PCB Aroc	PCB Aroclors®					PCT /	PCT Aroclors®	
1016 1221			- 1	.1242	1248	1254	1260	Total ^a	5432	5442	5460	Total ^a
23 U 45 U		Э		23 U	23 U	170	86	260	45 U	45 U	230 U	230 U
29 U 57 U		5	29 U	29 U	29 U	230	160	390	57 U	57 U	290 U	290 U
		5		290 U	290 U	1,400	2,300	3,700	57 U	57 U	760	760
200 U 400 U		Э		200 U	480	1,600	980	3,100	200 U	200 U	4,800 J	4,800 J
		3		29 U	29 U	340	280	620	29 U	29 U	770	770
7 U 33 U		Э		17 U	17 U.	75	63	140	17 JU	17 U	160	160
29 U 57 U		Э		29 U	29 U	140	120	260	29 U	29 U	230	230
		~		29 U	29 U	110	120	230	29 U	29 U	180	180
23 U 46 U		5		23 U	23 U	150	140	290	23. U	23 U	430	430
32 U 63 U	U 63 U	3	-	32 U	32 U	190 J	130	320 J	32 U	32 U	230	230

Note: All surface sediment samples were collected from a depth interval of 0-2 cm.

All results reported as μ g/kg dry weight.

- estimated

 tentatively identified 2 2

PCB

РСТ

 polychlorinated biphenyl
 polychlorinated terphenyl
 undetected at quantitation limit shown 5

^a Total PCB and total PCT for each sample is computed as the sum of Aroclors[®] according to the following rules: 1) if any Aroclor[®] is detected, all detected Aroclors[®] are summed; 2) if no Aroclor[®] is detected, the highest quantitation limit for any Aroclor[®] is used.

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Table B1-8. PCB congener and homolog results for surface sediment samples

				-				PCB C	PCB Congeners				
	Sample		Field					:	. 1		. 1	i	
Station	Number	Date	Split	18	28	37	44	49	52	99	20	74	17
Reference												1	
2229	SD0103 0	09/09/2002		0.056	0.17	0.092	0.21	0.33	0.39	0.65	0.40	0.22	0.082
2230	SD0104 0	09/09/2002		0.031	0.095	0.053	0.11	0.18	0.21	0.37	0.21	0.13	0.048
2231	SD0013 0	08/08/2001		0.12	0.37	0.19	0.27	0.46	1.8	0.025 U	0.025 U	0.025 U	0.25
2231	SD0134 0	09/14/2002		0.080	0.32	0.20	0.37	0.46	0.74	1.1	0.70	0.33	0.20
2240	SD0125 0	09/12/2002		0.10	0.47	0.25	0.40	0.68	0.84	1.4	0.74	0.38	0.16
2241	SD0128 0	09/12/2002		0.025 U	0.095	0.049	0.078	0.16	0.17	0.31	0.13	0.082	0.031
2243	SD0049 0	08/14/2001		0.047	0.17	0.088	0.15	0.31	0.35	0.62	0.27	0.14	0.075
2243	SD0124 0	09/12/2002		0.072	0.23	0.12	0.41	0.41	1.00	0.78	0.65	0.24	0.083
2244	SD0126 0	09/12/2002		0.092	0.19	0.096	0.23	0.33	0.52	0.58	0.39	0.18	0.063
2244	SD0127 0	09/12/2002	2	0.035	0.16	0.089	0.14	0.27	0.31	0.52	0.25	0.13	0.052
2265	SD0107 0	09/09/2002		0.055	0.025 U	0.089	0.30	0.43	0.63	0.80	0.56	0.27	0.11
2433	SD0041 0	08/12/2001		0.077	0.28	0.095	0.26	0.44	0.48	0.78	0.39	0.21	0.087
2433	SD0130 0	09/13/2002		0.081	0.28	0.12	0.24	0.37	0.47	0.76	0.44	0.23	0.072
2435	SD0102 0	09/09/2002		0.026	0.077	0.034	0.060	0.086	0.11	0.20	0.12	0.063	0.025 U
2440	SD0043 0	08/13/2001		0.47	1.0	0.39	1.8	2.3	3.4	2.9	2.8	1.1	0.47
2440	SD0131 0	09/13/2002		0.32	0.73	0.29	1.5	1.7	2.8	2.3	2.4	0.92	0.25
2441	SD0034 0	08/11/2001		0.089	0.21	0.057	0.15	0.22	0.28	0.41	0.27	0.13	0.050
2441	SD0123 0	09/12/2002		0.13	0.33	0.093	0.18	0.29	0.36	0.60	0.39	0.20	0.075
NASSCO					-								
NA01	SD0030 0	08/11/2001	-	0.84	1.7	0.58	4.8	4.3	10	5.9	7.0	2.4	0.82
NA01	SD0031 0	08/11/2001	0	0.60	1.3	0.56	4.5	4.2	9.7	6.0	6.3	2.3	0.83
NA01 ^b	SD0136 0	09/14/2002											
NA02	SD0033 0	08/11/2001		0.25	0.78	0.38	1.7	1.9	4.3	3.4	3.7	1.4	0.50
NA03	SD0032 0	08/11/2001		0.65	1.7	0.59	3.8	4.3	7.8	6.1	5.5	2.3	06.0
NA04	SD0035 0	08/11/2001		0.75	1.9	0.52	3.2	4.2	6.2	5.5	4.2	1.8	0.66
NA05		08/13/2001		0.31	0.84	0.35	2.1	2.6	4.2	3.7	3.1	1.3	0.49
NA06	÷.	08/09/2001		2.5	4.9	1.2	13	13	25	20	21	8.7	1.6
NA06 ^b	SD0101 0	09/08/2002											
NA07	SD0017 0	08/08/2001	•	2.3	3.7	0.85	9.2	12	19	7	12	4.8	1.0
NA07	SD0018 0	08/08/2001	'n,	2.5	4.0	0.86	8.0	1.1	- 17	13	12	5.2	1.3
NA08	SD0055 0	08/14/2001		0.66	1.6	0.49	3.7	5.0	9.5	5.4	5.5	2.1	0.65
NA09	SD0054 0	08/14/2001		0.83	1.6	0.55	3.6	3.9	7.8	5.7	5.7	2.3	0.66
NA10	SD0056 0	08/14/2001		0.24	0.74	0.28	1.9	2.0	3.7	3.1	2.6	1.1	0.41
NA11	SD0021 0	08/09/2001		0.44	1.1	0.36	2.4	2.8	4.4	4.2	3.4	1.6	0.51
NA12	SD0027 0	08/10/2001		0.25	0.76	0.30	2.2	3.3	3.7	5.7	3.9	1.8	0.63
NA13	SD0036 0	08/1:1/2001		0.22	0.80	0.39	1.2	1.6	2.7	3.1	2.5	1.2	0.50
NA13 ^b	SD0120 0	09/11/2002											

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Table B2-6. PCB and PCT results for sediment core samples

															V LUC	0,000	
	Sample		Field	Upper Denth	Denth				FUB AID	CIOLS						ciors	
Station	Number	Date	Split	(£)		1016	1221	1232	1242	1248	1254	1260	Total ^ª	5432	5442	5460	Total ^a
NASSCO	SD0141	00/18/2002		Ċ	ç	250 11	11 067	250.11	250 11	250 11	1 400 1	1.000	2 400 1	250 11	250 11	2 500	2.500
	SD0142	00/18/2002	Ŧ	2	1 4	240 11	11 024	240 11	240 11	240 11	1 600 1	1 200 1	2 800 .1	240 11	240 11	1 700 .1	1 700 .1
NA01	SD0146	09/18/2002	- ~	1 01	4	240 U	470 U	240 U	240 U	240 U	1,800 J	1,300 J	3,100 J	240 U	240 U	1,500 J	1,500 J
NA01	SD0143	09/18/2002		сı	5.5	21 U	41 U	21 U	21 U	21 U	280 J	240 J	520 J	21 U	21 U	330	330
NA02	SD0139	09/18/2002		0	7	19 U	38 U	19 U	19 U	19. U	250	240	490	19 U	19 U	380	380
NA02	SD0140	09/18/2002		2	3.7	13 U	26 U	13 U	13 U	13 U	56	46	100	13 U	13 U	7	. 12
NA04	SD0084	09/04/2002		0	2	. 22 U	43 U	22 U	22 U	390	550	520	1,500	22 U	22 U	660	660
NA04	SD0085	09/04/2002		2	4	22 U	44 U	22 U	22 U	310	670	620	1,600	44 U	44 U	069	690
NA04	SD0086	09/04/2002		4	9	230 U	460 U	230 U	230 U	650: J	1,300 J	880 J	2,800 J	230 U	230 U	1,500	1,500
NA04	SD0087	09/04/2002		9 9	8.3	200 U	400 U	200 U	200 U	1,200 J	2.100 J	1,300 J	4,600 J	400 U	400 U	2,400	2,400
NA06	SD0068	09/03/2002		0	5	20 · U	39 U	20 U	20 U	390	720	470	1,600	200 U	200 U	1,400	1,400
NA06	SD0069	09/03/2002		ิณ	3.9	130 U	260 U	130 U	130 U	580	730	380	1,700	130 U	130 U	1,200	1,200
NA09	SD0079	09/04/2002		0	7	220 U	430 U	220 U	220 U	2,100 J	3,300 J	1,900 J	7,300 J	220 U	220 U	7,200 J	7,200 J
NA09	SD0080	09/04/2002		2	4	220 U	440 U	220 U	220 U	2,300 J	4,200 J	2,500 J	6,000 J	220 U	220 U	6,400 J	6,400 J
NA09	SD0081	09/04/2002		4	9	210 U	410 U	210 U	210. <i>U</i>	5,100 J	6,500 J	2,800 J	14,000 J	210 U	210 U	8,800 J	8,800 J
NA09	SD0082	09/04/2002		9	8	17 U	34 C	17 U	17 U	.09	140	86	290	, 17 U	17 U	400	400
NA13	SD0156	09/20/2002		0	2	15 U	30 U	15 U	15 U	15 U	100	110	210	15 U	15 U	190	190
NA13	SD0157	09/20/2002		2	ε	13 U	25 U	13 U	13 U	13 U	13 U	13 U	25 U	13 U	13 U	61 U	61 <i>U</i>
NA16	SD0075	09/04/2002		0	2	230 U	450 U	230 U	230 U	1,000	1,600	1,100	3,700	230 U	230 U	2,900	2,900
NA16	SD0076	09/04/2002	•	2	4	210 U	410 U	210 U	210 U	660 J	1,400 J	700 T	2,800 J	210 U	210 U	1,500 J	1,500 J
NA16	SD0078	09/04/2002	M .	2	4	210 U	420 U	210 U	210 U	1,300 J	2,300 J	1,200 J	4,800 J	210 U	210 U	6,300 J	6,300 J
NA16	SD0077	09/04/2002		4	6.1	19 U	37 U	19 U	19 U	46		48	160	19 U	19 U	140	140
NA17	SD0088	09/04/2002		0	2	28 U	55 U	28 U	28 U	180 J	150 J	620 J	1,600 J	25.5	2 22	00/	00/
NA17	SD0089	09/04/2002		~ ~	4	15 U	30 5	15 U	15 U	270	610 10 1	340	1,200	30 0	30.0	350	350
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STOORS SECTIONS Z 4 BBU	1/26/2002		0	2	27 U	53 U	27 U		210 J	510	680	1,400 J	27 U	27 U	830	830
SD0019 08/28/2002 4 6.2 14.U 27.U 14.U 14.U 19.U	126/2002		~	4	88 U	180 U	88 U		570 J	880 J	930 J	2,400 J	88 U	88 U	1,700	1,700
SD0003 08/28/2002 0 2 19/1 38/1 19/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 14/1 15/1 13/1 <th13 1<="" th=""> 13/1 13/1 <t< td=""><td>126/2002</td><td></td><td>14</td><td>6.2</td><td>14 U</td><td>27 U</td><td>14 U</td><td></td><td>190 J</td><td>280</td><td>190</td><td>660 J</td><td>14 U</td><td>14 U</td><td>490</td><td>490</td></t<></th13>	126/2002		14	6.2	14 U	27 U	14 U		190 J	280	190	660 J	14 U	14 U	490	490
SD0000 BNSH2002 2 4 14U 14U <th1u< <="" td=""><td>2002020</td><td></td><td>· c</td><td>•</td><td>19 [1</td><td>38 U</td><td>19 U</td><td></td><td>49 J</td><td>97</td><td>100</td><td>250 J</td><td>19 U</td><td>19 U</td><td>180</td><td>180</td></th1u<>	2002020		· c	•	19 [1	38 U	19 U		49 J	97	100	250 J	19 U	19 U	180	180
Second Second	2002/02/0		, (14	14 11	27 U	14 U		14 U	14 U	15	15	14 U	14 U	66 U	66 U
SD0003 08/13/2002 1 3 0 3	2002/02/02		v -	t k		26.11	13 11		13 U	13 U	13 U	26 U	13 U	13 U	64 U	64 C
SD0004 061/32002 15 24 13/U	2/28/2002		4 C	t u 10 t	5 2	650 11	330 11		330 U	3.500	3,300	6.800	650 U	650 U	3,300 U	3,300 U
SD0000 06/13/2002 0 2 190 3/0 3/200 3/200 7/500 3/200	2002/01/0		5 u		, =	25.11	13 11		13 U	270	290	560	25 U	25 U	130 U	130 U
SD0000 06/13/2002 2 3 13 1 13 1 19 310 26 27 26 27 26 27 26 27 26 27 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 27 26 27 26 27 27 27 27 27 27 27 26 27 27 26 27 26 27 26 27	2002/01/0		<u>;</u> c	t c i	, =	380.11	190 11		1.100 J	3.200 J	3.200 J	7,500 J	380 U	380 U	2,800	2,800
SD0001 06132002 2 16 31 16 16 16 31 1 31	2/13/2002		, ,	v v	, ⇒	2 000	13.11		190	310	380	880	26 U	26 U	130 U	130 U
SD0000 06132202 2 42 18 35 0 370 970 35	5/13/2002		N C	ົ່ຕ	2 97	31 12	16 11		54	150	92 J	300 J	31 U	31 U	290	290
SD0004 08/14/2002 1 0 2 1 1 1 0 2 0 3 0 0	5/13/2002		, ,	4 5		35.1	18 1		220	380	370	970	35 U	35 U	430	430
SD0010 0811412002 2 0 240 210.1 540.1 36.1 36.1 SD0016 0811412002 2 4.3 14.1 27.1 14.1 18.1 18.1 36.1 27.1	2002/01/02	• •	4 C	4 C	181	36 U	18 U		110	290	270	670	36 U	36 U	520	520
SD0010 081442002 2 4.3 14.0 27.0 14.0 14.0 27.0	2002/11/2	- c		4 6	1 81	36.11	18 11		06	240	210 J	540 J	36 U	36 U	500	500
SD0013 081442002 5.3 5.6 13 U 13 U 13 U 13 U 13 U 13 U 25 U 26 U 400 U 40		J		1 6	14 11	11 1.6	14.11		42	58	58	160	27 U	27 U	140 U	140 U
SD0010 081/442002 0 2 200 J 400 J 400 J 200 J 730 J 2,300 J 4,900 J 400 U 40 U	2002/11/0		4 C 4	, u F u	13.1	25 11	13 11		13 U	13 U	13 U	25 U	25 U	25 U	130 U	130 U
SD0010 06/14/2002 2 4 17.0 34.0 17.0 34.0 36.0	2002/14/2002			, ,) =	400 11	200		730 J	2.300 J	1,900 J	1 ,900 J	400 U	400 U	3,300	3,300
SD0011 081442002 4 5.3 17.0 34.0 17.0 24 45 57 130 34.0 34.0 SD0043 081842002 4 5.3 17.0 31.0 160.0 160.0 160.0 160.0 160.0 130.0 770.3 2100.3 34.0 34.0 SD0043 081842002 2 4 14.0 160.0 160.0 160.0 160.0 130.0 770.3 2100.3 310.0 310.0 SD0045 0812812002 2 4 14.0 14.0 14.0 14.0 14.0 27.0 2	5/14/2002		, ,	V -) =	1 V2	17 11		430	640	400	1.500	34 U	34 U	560	560
SD0042 001442001 0014400 1600 0104 1600 1700 2700 270 270 270 270 270 270 270 270 270 270 270 270 260 260 260 260 260 260 260 260 240 240 240 240 240 240 240 240 240 240 240 240 240 260 260 260 260 560	0/14/2002		N T	+ ~	1 1		11 1		24	45	57	130	34 U	34 U	170 U	170 U
SD0045 05/261/2002 2 4 14/U 14/U 14/U 14/U 27/U 26/U	0/14/2002		+ <	, , ,) =	310 11	160 11		160 U	1.300 J	r 022	2.100 J	310 U	310 U	4,600 J	4,600 J
SD0044 06/26/2002 2 4 14 2 <td>8/28/2002</td> <td></td> <td>, c</td> <td>ч т</td> <td>s د</td> <td>2 2 2 2</td> <td>1 11</td> <td></td> <td>14 11</td> <td>14 11</td> <td>14 U</td> <td>27 U</td> <td>27 U</td> <td>27 U</td> <td>140 U</td> <td>140 U</td>	8/28/2002		, c	ч т	s د	2 2 2 2	1 11		14 11	14 11	14 U	27 U	27 U	27 U	140 U	140 U
SD0045 08/28/2002 4 6 13 U 13 U 13 U 13 U 13 U 12 U	8/28/2002		7	4 (5:					12.0	13 11	76 11	26 11	76 11	130 U	130 U
SD0046 08/28/2002 0 1 1 1 1 1 50 1 <td>8/28/2002</td> <td></td> <td>4 (</td> <td>ю г</td> <td>5 2</td> <td>2 20</td> <td>5 5 5 5 5</td> <td></td> <td>10 11</td> <td>10 00</td> <td>12 1</td> <td>24 U</td> <td>24 U</td> <td>24 U</td> <td>120 U</td> <td>120 U</td>	8/28/2002		4 (ю г	5 2	2 20	5 5 5 5 5		10 11	10 00	12 1	24 U	24 U	24 U	120 U	120 U
	8/28/2002		0	~ r	5 2		24 12		25 11	560	420	080	50 U	50 U	1.100	1,100
	2002/62/8		5 (N 7	5 2				1 60	61	130	190	57 U	57 UJ	290 U	290 UJ
SW30 SD0056 08		08/14/2002 08/14/2002 08/14/2002 08/14/2002 08/28/2002 08/28/2002 08/28/2002 08/28/2002 08/28/2002 08/28/2002	1142002 1142002 1142002 1142002 1142002 112872002 112872002 112872002 112872002 112872002 112872002 112872002	N1412002 5.3 31412002 5.3 31412002 2 31412002 2 31412002 2 31312022 2 312812002 6 312812002 7 312812002 7 312812002 7 312812002 7 312812002 7 32812002 7 32812000 7 328120000 7 328120000 7 328120000000000 7 32812000000000000000	и 1 и о и 4 о и 4 о о и	1 0 0 4 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0	5.5 0 2 4 5.6 4 5.3 5.6 5.6 5.3 7 1 1 1 1 1 1 1 1 1 1 1 1 1	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5.3 5.6 $13 U$ $25 U$ $13 U$ $13 U$ 2 $40 U$ $200 U$ $400 U$ $200 U$ $17 U$ 2 $40 U$ $200 U$ $200 U$ $200 U$ $17 U$ $17 U$ 4 $17 U$ $34 U$ $17 U$ $17 U$ $17 U$ $17 U$ 2 $17 U$ $310 U$ $160 U$ $200 U$ $200 U$ 2 $160 U$ $310 U$ $160 U$ $17 U$ $17 U$ 2 4 $14 U$ $27 U$ $14 U$ $14 U$ 2 $13 U$ $25 U$ $25 U$ $25 U$ $25 U$ 2 $29 U$ $57 U$ $29 U$ $29 U$ $29 U$	5.3 5.6 $13 U$ $25 U$ $13 U$ $13 U$ 2 $40 U$ $200 U$ $400 U$ $200 U$ $17 U$ 2 $40 U$ $200 U$ $200 U$ $200 U$ $17 U$ $17 U$ 4 $17 U$ $34 U$ $17 U$ $17 U$ $17 U$ $17 U$ 2 $17 U$ $310 U$ $160 U$ $200 U$ $200 U$ 2 $160 U$ $310 U$ $160 U$ $17 U$ $17 U$ 2 4 $14 U$ $27 U$ $14 U$ $14 U$ 2 $13 U$ $25 U$ $25 U$ $25 U$ $25 U$ 2 $29 U$ $57 U$ $29 U$ $29 U$ $29 U$	5.3 5.6 $13U$ $25U$ $13U$ $13U$ $13U$ 0 2 $200U$ $400U$ $200U$ $200U$ $730J$ 2 4 $17U$ $17U$ $17U$ $17U$ $730J$ 2 4 $17U$ $71U$ $17U$ $70U$ $200U$ 2 $17U$ $71U$ $17U$ $17U$ $730J$ 2 4 $17U$ $71U$ $17U$ $70U$ 2 4 $14U$ $20U$ $160U$ $160U$ 2 $13U$ $25U$ $25U$ $25U$ $25U$ 2 2 $20U$ $25U$ $25U$ $25U$ 2 $29U$ $57U$ $29U$ $25U$ $29U$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				

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Table B2-6. (cont.)

			Upper	Lower				PCB Aroclors [®]	clors®					PCT Aroclors [®]	lors®	
Sample		Field	Depth	Depth												
Station Number	Date	Split	£	ŧ	1016	1221	1232	1242	1248	1254	1260	Total ^a	5432	5442	5460	Total
SW30 SD0057 (08/29/2002		4	9	19 U	37 U	19 U	19 U	19 U	19 U	19 U	37 U	37 U	37 UJ	190 U	190 UJ
SW30 SD0058 (08/29/2002		9	80	14 U	28 U	· 14 U	14 U	14 · U	14 U	14 U	28 U	28 U	28 UJ	140 U	140 UJ
SW30 SD0060 (08/29/2002		æ	8.7	13 U	26 U	13 U	13 U	13 · <i>U</i>	13 U	13 U	26 U	26 U	26 UJ	130 U	130.00
SW31 SD0024 (08/27/2002		0	2	14 U	28 U	14 U	14 U	14 U	350	240	590	14 U	14 U	1 0 1	70 U
0	08/27/2002		7	2.9	13 U	26 U	13 U	13 U	13 U	13 U	13 U	26 U	13 U	13 U	65 U	65 U
•••	08/29/2002		Ģ	2	19 U	37 U	19 U	19 U	47 J	71	86	200 J	36 U	36 U	180 U	93 J
0,	08/29/2002		0	2.8	12 U	24 U	12 U	12 U	12 U .	12 U	12 U	24 U	24 U	24 UJ	120 U	120 UJ
0,	08/28/2002		0	2	16 U	31 U	16 U	16 U	28 J	23	63	140 J	16 U	16 U	140 J	140 J
	08/28/2002		2	2.5	12 U	23 U	12 U	- 12 U	12 U	12 U	12 U	23 U	23 U	23 U	120 U	120 U
	08/29/2002		0	5	16 U	31 U	16 U	16 U	16 U	82	120	200	32 U	32 U	160 J	160 J
	08/29/2002	2	0	2	16 U	32 U	16 U	16 U	16 U	110 J	130 J	240 J	32 U	32 U	160 U	140 J
SD0022	08/27/2002		0	7	28 U	55 U	28 U	28 U	110 J	260 J	340 J	L 017	28 U	28 U	440	440
SW36 SD0023 (08/27/2002		2	4.3	20 U	40 U	20 U	20 U	230 J	720	540	1,500 J	200 U	200 U	1,600	1,600
Note: All results reported as µg/kg dry weigh	d as µg/kg dry	r weight.		-												

L PCB PCT

estimated
 polychlorinated biphenyl
 polychlorinated terphenyl
 undetected at quantitation limit shown

^a Total PCB and total PCT for each sample is computed as the sum of Aroclors[®] according to the following rules: 1) if any Aroclor[®] is detected, all detected Aroclors[®] are summed; 2) if no Aroclor[®] is detected, the highest quantitation limit for any Aroclor[®] is used.

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Table B2-7. PCB congener and homolog results for sediment core samples

		Field	Depth	Depth			ۍ د								
					0	00				c L	5	04	44		0
Station Number	Date	Split	€	(Ħ)	18	28	10	44	49	ZC	QQ	5	4	2	ß
				•			(Ĺ		ç	Ę	ç	(,	1
NA01 SD0141	09/18/2002		0	5	6.2	14	4.2	29	5 2	53	42	53	7	4. 3	Z.L
NA01 SD0142	09/18/2002		7	4	11	23	6.1	35	32	50	51	65	29	4.9	0.94
NA01 SD0146	09/18/2002	2	2	4	11	23	6.3	34	32	51	51	64	29	4.8	1.1
NA01 SD0143	09/18/2002		5	5.5	0.88	2.5	0.60	4.7	4.9	9.5	6.6	10	3.8	0.62	0.24
NA02 SD0139	09/18/2002		0	2	0.98	2.3	0.84	0.025 U	5.3	8.6	8.5	7.9	3.8	0.78	0.23
NA02 SD0140	09/18/2002		0	3.7	0.48	0.92	0.24	1.3	1.5	2.0	2.4	2.3	1.2	0.14	0.039
	09/04/2002		0	2	11	20	2.4	18	21	27	е В	23	12	2.1	0.36
NA04 SD0085	09/04/2002		7	4	4.2	9.0	2.3	7.9	9.1	13	19	17	8.4	2.7	0.41
	09/04/2002		4	9	7.2	18	5.4	30	31	49	45	51	24	5.8	06.0
	09/04/2002		9	8.3	21	39	8.6	65	59	100	83	110	48	7.1	1.9
	09/03/2002		0	2	4.3	8.5	1.7	17	6.5	28	24	28	12	1.6	0.65
	09/03/2002		2	3.9	10	19	3.7	32	12	53	43	57	24	2.3	1.2
NA09 SD0079	09/04/2002		0	7	46	71	12	40	36	100	130	170	71	8.5	3.1
	09/04/2002		2	4	43	64	14	46	39	240	160	240	93	12	5.2
	09/04/2002		4	9	83	130	26	7.1	56	310	230	330	140	17	5.2
_	09/04/2002		9	8	0.39	0.59	0.14	1.1	0.38	1.9	1.5	2.0	0.81	0.11	0.035
NA09 SD0083	09/04/2002		æ	8.8	0.14	0.21	0.050	0.14	0.12	0.36	0.55	0.79	0.29	0.038	0.025 U
	09/20/2002		0	7	0.44	0.96	0.27	2.4	2.1	5.1	3.2	4.0	1.6	0.35	0.16
-	09/20/2002		7	e	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 <i>U</i>				
	09/04/2002		0	7	3.3	8.1	1.6	12	12	21	17	53	9.4	0.94	0.39
NA16 SD0076	09/04/2002	-	0	4	19	33	7.6	21	18	84	74	94	42	4.7	1.9
NA16 SD0078	09/04/2002	2	7	4	8.9	16	3.5	23	8.7	38	32	40	18	2.1	0.57
NA16 SD0077	09/04/2002		4	6.1	0.63	1.2	0.27	0.70	0.61	2.6	2.6	3.2	1.5	0.17	0.051
NA17 SD0088	09/04/2002		õ	2	1.1	1.9	0.69	9.1	6.3	21	9.1	15	4.4	1.4	0.61
NA17 SD0089	09/04/2002		2	4	7.0	9.0	1.9	9.4	8.1	16	17	21	9.0	1.6	0.50
NA17 SD0090	09/04/2002		4	5.1	0.14	0.11	0.025 U	0.13	0.13	0.23	0.10	0.100	0.049	0.025 U	0.025 U
NA19 SD0065	09/03/2002		ò	2	2.1	1.2	0.99	13	9.4	28	13	23	6.7	2.5	0.87
NA19 SD0066	09/03/2002		0	4	5.3	1.7	1.7	21	16	41	20	36	12	1.6	0.97
NA19 SD0067	09/03/2002		4	5.8	3.4	5.3	1.5	8.7	3.2	15	12	16	6.8	0.65	0.31
NA20 SD0070	09/04/2002		0	2	0.30	0.36	0.40	0.95	1.3	2.5	3.6	3.6	1.5	0.39	0.12
NA20 SD0071	09/04/2002		0	4	0.59	1.5	0.48	0.93	1.2	2.2	3.7	3.2	1.5	0.48	0.15
NA20 SD0072	09/04/2002	•	4	9	1.8	3.6	1.1	5.5	1.9	8.9	6.8	7.7	3.5	0.68	0.23
NA20 SD0074	09/04/2002	2	4	9	1.9	3.3	1.2	2.0	1.8	8.0	6.6	7.4	3.4	0.69	0.26
NA20 SD0073	09/04/2002		9	8.1	0.45	0.76	0.28	1.1	0.96	1.7	1.4	1.6	0.73	0.14	0.055
	09/21/2002		0	2	4.9	12	3.3	19	18	31	28	38	15	3.2	0.90
NA21 SD0159	09/21/2002		2	4	0.29	0.57	0.12 U	1.3	1.6	2.7	2.0	3.1	1.1	0.30	0.13
NA21 SD0160	09/21/2002		4	G	0.12	0.24	0.074	0.46	0.51	0.83	0.73	0.89	0.39	0.073	0.025 U
NA21 SD0161	09/21/2002		9	7.6	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U				
NA23 SD0091	09/04/2002		0	2	1.4	2.9	0.72	4.3	4,2	8.0	8.2	8.7	3.4	1.00	0.29
NA23 SD0092	09/04/2002		2	4	4.0	7.9	1.5	12	9.7	20	16	21	8.2	1.4	0.51
-	09/04/2002		4	4.7	0.19	0.28	0.052	0.39	0.65	0.79	0.71	0.71	0.29	0.045	0.025 U
NA24 SD0165	09/21/2002		0	2	0.26	0.64	0.18	12	1.3	2.3	2.1	1.8	0.80	0.22	0.071

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Fact Sheet: Sources of Polychlorinated Biphenyls

Purpose

This fact sheet is intended to help Oregon Department of Environmental Quality (DEQ) project managers and City of Portland stormwater inspectors understand the types of industries, processes, and products that might be potential sources of polychlorinated biphenyls (PCBs). There are a variety of potential PCB sources in addition to more commonly recognized sources such as electrical transformer and capacitor oils and fluorescent light ballasts.

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Background

utation program accession

PCBs are mixtures of synthetic organic chemicals that were commonly used for various applications from approximately 1929 until 1979 when the U.S. banned PCB manufacturing, processing, distribution, and use (EIP Associates, 1997). The U.S. was responsible for approximately half of the world's production of PCBs and imported approximately 50% of the remainder produced by other countries (minus exports) (EIP Associates, 1997; UNEP Chemicals, 1999). PCBs were produced and marketed in the U.S. under the trade names of Aroclor (produced by Monsanto Chemical Company) and Pyranol (produced by General Electric) (Nagpal, 1992). Because of health concerns, in 1971 Monsanto voluntarily restricted manufacturing of PCBs to use only in closed systems. Monsanto discontinued manufacture of PCBs in 1977, though PCBs continued to be imported into the U.S. until 1979 when the U.S. ban took effect (EIP Associates, 1997; ATSDR, 2000).

There are no natural sources of PCBs. Although their current commercial use is restricted in the U.S., they continue to be a common environmental contaminant because they are extremely stable.

Regulatory Framework- 2000 and the off of cashe and the contract of the second se

PCBs were regulated under a series of EPA actions culminating with a ban in 1979 on manufacturing, processing, distribution, and use of PCBs under the Toxic Substances Control Act (TSCA). Items such as transformers and hydraulic fluids were identified as high-risk sources and were targeted for accelerated phase-out. EPA anticipated that other lower-risk sources would eventually be removed from circulation as various products reached the end of their useful lives.

Certain current uses of PCBs are authorized under 40 CFR Part 761 and are summarized in Table 1:

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 $\Delta \pi EXHIBIT (122)$

Date 2-10-11 Rptr.

Deponent Ca

PCB FACT SHEET.CP.8-6-03.DOC

TABLE 1 CONTRACT OF CONTRACT CONTRACTOR

Current Authorized Uses of PCBs

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Use	Comments
Transformers	Authorized use at any concentration though restrictions and regulatory requirements increase with higher PCB concentration thresholds.
Railroad Transformers	Transformers used in locomotives and self-propelled railcars. Authorized use at < 1,000 ppm; < 50 ppm if transformer coil is removed at any time.
Heat transfer systems, hydraulic systems, mining equipment	Authorized use at < 50 ppm diversion transferences and give of behaving a set. Tool and diversion transferences briefford to gitt one groups and briefs
Natural gas pipelines	Authorized at < 50 ppm, or at > 50 ppm with additional requirements. PCBs may be present in natural gas compressors, scrubbers, filters, and in condensate.
Research & Development	Authorized primarily for purposes relating to environmental analysis, management, and disposal of PCBs. R&D for PCB products is prohibited.
Scientific Instruments	Examples include oscillatory flow birefringence & viscoelasticity instruments for the study of the physical properties of polymers, microscopy mounting fluids, microscopy immersion oil, and optical liquids.
Carbonless copy paper	Use of existing carbonless copy paper is permitted; manufacturing of new carbonless copy paper is not authorized.
Electromagnets, switches, voltage regulators, circuit breakers, reclosers, cable	No restrictions on existing use, restrictions on PCB concentrations if serviced and oil is removed or replaced.
Porous suffaces table a the an Dogwall the bound to book with the set of the theol 200 g	EPA considers building materials, such as concrete, porous with respect to PC leaks and spills. Porous building materials may be left in place following spill provided various conditions are met. Older industrial machinery often was designed to slowly leak (PCB-containing) hydraulic oil as a lubricant.

ine ille, they continue to be a proceed environmental contractment because trad are

Under 40 CFR Part 761, recycled PCBs are defined as "those PCBs which appear in the processing of paper products or asphalt roofing materials from PCB-contaminated raw materials". Recycled PCBs are subject to the following restrictions:

- No detectable concentrations of PCBs are permitted in asphalt roofing materials that leave the manufacturing site; and
- Manufactured and imported paper products must have an annual average of less than 25 ppm PCBs with a maximum of 50 ppm.

Some manufacturing processes may inadvertently generate PCBs. These typically include chemical processes that involve hydrocarbons, chlorine, and heat. Typical processes include production of chlorinated solvents, paints, printing inks, agricultural chemicals, plastics, and detergent bars. These processes may be defined as "excluded manufacturing processes" under 40 CFR Part 761 if the following conditions are met:

alere all

Manufactured or imported products must contain < 25 ppm PCBs;

□ Manufactured or imported detergent bars must contain < 5 ppm PCBs;

PCB concentrations must be less than 10 ppm at the point which PCBs are released to ambient air;

"...PCBs added to water discharged from a manufacturing site must be less than 100 micrograms per resolvable gas chromatographic peak per liter of water discharged"; and and any should be to add to the segure of a

Disposal of process wastes with PCB concentrations > 50 ppm must be conducted in accordance with 40 CFR Part 761 Subpart D.

Sources of PCBs

In the U.S., the most commonly used Aroclors were: 1221, 1232, 1242, 1248, 1254, and 1260 (DEQ, 1997). These and other Aroclors were used in a variety of materials to enhance insulative properties, improve physical and chemical resistance, and act as plasticizers, coolants, and lubricants. Additional information about specific Aroclors is included in Table A-1 (see Attachment 1) a binktalisti vitamine ouris group lat mana

Approximate usage of PCBs in the US is summarized as follows (EIP Associates, 1997):

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Closed system and heat transfer fluids (transformers, capacitors, fluorescent light ballasts, etc.): 60%

Clark Gentres

Plasticizers: 25%

Hydraulic fluids and lubricants: 10%

Miscellaneous uses: 5%

As shown in Table 2, PCBs were commonly used in a number of electrical, heat transfer, and hydraulic applications as well as a range of other applications.

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TABLE 2	an a	
PCB Uses	andre frænsland og sen stande for en som frænslande som	
Primary Applications	Barring and an and a straight and a	
Dielectric fluids and transformers	sources would be facilities which used, stored, and servin	ced electrical equipment facilities could include, pution facilities; electrical yards; and
Capacitors 65%	Present in industrial facilities, industrial machinery both consumer products. Includes larger power-factor correct with transformers, manufacturing facilities, and commerce near high power-usage equipment such as computer room cooling units), and smaller electric	ion capacitors associated

	equipment and appliances such as hair dryers, air conditioners, refrigerators, power tools, and submersible well pumps. Also includes capacitors used in
LE TANK &	appliances and electronics such as televisions and microwave ovens.
Fluorescent light ballasts	PCB-containing capacitors were used in fluorescent light ballasts. PCB-containing asphaltic resin (potting material) was also utilized as insulating material for some ballasts.
Blectromagnets	Oil-cooled electromagnets are constructed with coils immersed in transformer oil to prevent over-heating and shorting. Used in cranes for picking up metal and for metal separation in recycling operations (metal scrap yards, tire shredding, concrete crushing, slag operations, etc.).
Miscellaneous electrical equipment	Switches, voltage regulators, circuit breakers, reclosers, rectifiers, and some oil- cooled electric motors.
Heat transfer systems	Where oil is circulated through a non-contact system as a heat transfer medium for heating, cooling, and maintaining uniform temperature throughout a system or manufacturing process. Wide variety of applications in manufacturing industries including high-tech, asphalt, pulp and paper, metal products such as steel tubing and die casting, adhesives, chemicals, food processing, paint & coatings, textiles, etc.
Hydraulic fluids	Any application of hydraulic oil such as industrial equipment and machinery, commercial equipment, automotive brake fluid, etc. () and () () () () () () () () () (
Plasticizers	Used in polyvinyl chloride plastic, neoprene, chlorinated rubbers, laminating adhesives, sealants and caulking, joint compounds (concrete), etc.
Lubricants	Cutting oils, compressors, electrical equipment, oil-impregnated gaskets and filters; also currently present in low concentrations in recycled oil. Also used in vacuum pumps at high tech and electronics manufacturing facilities, research labs, and wastewater treatment plants.
Other applications of PC	Bs
Dust control (dedusting agents)	Present in dust control formulations, and used oil historically used for dust suppression.
Pesticides	As an extender to extend the life of pesticides.
Fire retardants	Coatings on ceiling tiles, and textiles including ironing boards and yarn.
Paints, coatings	As plasticizers in paint, corrosion resistant paints for various applications including military/navy ships, corrosion resistant epoxy resins on metal surfaces, film casting solutions for electrical coatings, varnish, lacquers, and waterproofing coatings for various applications.
Carbonless copy paper	
s Printing inks ite in opposite in the second secon	Ink for newsprint and as a dye carrier; also used as a solvent for deinking newsprint for recycling and the solution of the
Investment casting waxes	Used as wax extenders
Wood treatment	May be present as an impurity in pentachlorophenol (Warrington, 1996).
Sources: ATSDR (2000), DEQ	(1997), EIP Associates (1997), UNEP Chemicals (1999)

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Due to the long service life of many PCB-containing items and the use of PCBs in some durable, relatively inert products, PCB-containing materials will continue to be disposed of and processed in waste and recycling operations. Waste products and recycling operations that may process significant quantities of PCB-containing materials are described in Table 3:

TABLE 3	en here bei eine eine here here open an de eine aberte eine de legen ab keinen eine eine einer einer einer ang Beneren einer ei
^{rCD} Sources In Wast	e Materials And Recycling Operations
Material or Operation	Comments Provide Long and the approximate and the contract of
Scrap metal recycling	Transformer shell salvaging heat transfor and huder it
	insulation). Also present in non-ferrous metal salvaging as parts from PCB- containing electrical equipment, and oil & mean insulation in the salvaging sector of the salvaging as parts from PCB-
Auto'salvage yards, auto crushing	Hydraulic fluid, brake fluid, recycled oil, capacitors, and oil-filled electrical equipment such as some ignition colls.
Repair activities	Shipyards (electrical equipment, hydraulic oil, paint, etc.), locomotive repair, heav equipment repair facilities, auto repair, repair of manufacturing equipment, etc.
Used oil	May be present in used oil from various sources including auto salvage yards; automotive and heavy equipment repair shops, hydraulic equipment repair, in industrial machinery repair, etc. Because some PCBs have been mixed with used oil, some recycled oils currently in circulation may contain PCBs at concentrations generally < 50 ppm. PCBs may also be present where used oil has been used for dust suppression/road oiling, weed control, and energy recovery.
Recycled paper	Paper may contain PCBs where carbonless copy paper has been used in recycling. However, PCB concentrations have decreased over time as the volume of unrecycled carbonless copy paper is reduced. Recycled paper containing PCBs has historically been used for food packaging (CWC, 1997). PCB concentrations in food packaging are restricted to 10 ppm unless an impermeable barrier is present between the packaging and food product (FDA, 2003).
Gffluent	PCBs may be in wastewaters from manufacturing facilities and equipment such as chemical and pesticide facilities, pulp and paper mills, cooling waters from vacuum pumps and electric power generation facilities where leaks have occurred, and condensate from vacuum pumps and natural gas pipelines. Significant cleanup activities have been performed at natural gas pipeline compressor stations from discharges of condensate to ground and storm drainage systems (DOJ, 2002).
sphalt roofing materials, Ir paper, and roofing felt	Anticipated at generally very low concentrations where used oil containing PCBs has been used in asphalt mix.
uilding demolition	Electrical equipment, joint caulking, oil & grease insulated cable, surface coatings as flame retardant and waterproofing.
redge spoils	From areas where contaminated sediments are present.
undfills	Municipal and industrial solid waste; virtually all potential sources could be present, including waste materials and soils from remediation sites.
astewater treatment ant sludge	Derived from atmospheric deposition and stormwater, water supply systems, leaks and spills, leaching from coatings and plastics containing PCBs, PCBs in food and human waste.

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Prior to the regulation of PCBs under the Toxic Substances Control Act (TSCA) in 1976, PCBs were released (both accidentally and intentionally) into the atmosphere, water, and land through sewers, smokestacks, stormwater runoff, spills, and direct application to the environment (for example, to reduce dust emissions and to extend the life of some agricultural pesticide formulations) (Flynn, 1997). Large volumes of PCBs have been introduced to the environment through the burning of PCB-containing products, vaporization from PCB-containing coatings and materials, releases into sewers and streams, improper disposal of PCB-containing equipment in non-secure landfill sites and municipal disposal facilities, and by other routes (such as ocean dumping) (ATSDR, 2001).

Based on the current regulation of PCBs, the current primary "new" sources of PCB contamination are limited to outdated or illegal landfills and scrap yards and leaks or explosions of electrical equipment and other equipment (such as locomotive transformers) that may still contain PCBs (ATSDR, 2001). Other sources are facilities or sites that were previously contaminated with PCBs (for example, contaminated sediments). From contaminated sites, PCBs are emitted and re-deposited to the environment via volatilization from water and soil, wet and dry depositions, and revolatilization (HSDB, 2003). These processes are discussed in further detail in Attachment 2.

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Attachment 1 – Common Uses of Aroclors

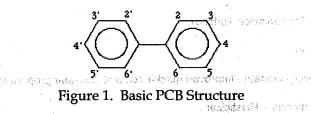
Common uses of specific Aroclors are shown in Table A-1. South the later with the star out the form

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	sof Aroclors
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A-1242	Polyvinyl acetate - Improved quick-track and fiber-tear properties
Kadatasy)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
the state of the state	
M. Howards	Hydraulic fluid
n kina ha	Gas transmission turbines
	Rubbers
Minior ob :	
the the property	Wax extenders
	Polyvinyl acetate - Improved quick-track and fiber-tear properties
-1248	Hydraulic fluids
ni la 14 Gadina	Hydraulic fluids
S. CONT.	vacuum pumps Astronomical and a general particular and a second data general astronomical and a second data general astronomical astronomica
Water States	Rubbers of the store of the start of the start and start of the store
al an	Polyvinyl chloride - Secondary plasticizers to increase flame retardence and chemical resistance
Stera La	From resing Increased and chemical resistance
1054	Epoxy resins - Increased resistance to oxidation and chemical attack; better adhesive properties
1254	Transformers
ļ	Capacitors

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Attachment 2 – Fate and Transport of PCBs

The basic chemical structure of PCBs includes two benzene rings (known as the biphenyl) and between 1 and 10 chlorine atoms substituted on each of the benzene molecules. Figure 1 shows the basic structure of PCBs, where the numbers 2-6 and 2'-6' represent possible substitution locations for chlorine. There are a total of 209 individual PCB compounds (known as congeners) (Flynn, 1997). Typically, PCBs occur as mixtures of congeners (that is, Aroclors) (Bernhard and Petron , 2001). Aroclors are identified by number (such as 1254), with the last two digits representing the percent content of chlorine; higher Aroclor numbers reflect higher chlorine content (ATSDR, 2001).



As discussed in the main text of this fact sheet, PCBs were emitted in large quantities before PCB manufacturing was banned in the U.S. Between 1930 and 1970, approximately 30,000 tons were released to air, 60,000 tons to fresh and coastal waters, and 300,000 tons to dumps and landfills (HSDB, 2003). Because of their extreme chemical and thermal stability, once they are introduced to the environment they remain there for years or even decades (ATSDR, 2000).

PCBs are nonpolar and therefore are only slightly soluble. This characteristic inhibits the transport of PCBs from soil to water (groundwater or surface water) and makes them bind strongly to soils. PCBs can be transported to surface water via entrainment of contaminated soil particles in surface water runoff. In water, a small portion of PCBs will dissolve, but the majority will bind to organic particles and bottom sediments (Nagpal, 1992). Although PCBs have a strong affinity for sediment, small amounts of PCBs are released from sediments to water over time (ATSDR, 2000). Once in the water, PCBs are also taken up by small organisms and fish. PCBs accumulate in the fatty tissue of these organisms.

PCBs have a relatively low vapor pressure. Despite their low volatility, PCBs do volatilize from both soil and water. This is a result of their widespread presence and extreme stability (DEQ, 1997). Once re-emitted, PCBs can be transported long distances in air, and then redeposited by settling or scavenging by precipitation. This cycling process continues indefinitely and is referred to as the grasshopper effect (EPA, 2001). It is estimated that there are currently 1,000 tons of PCBs cycling through the atmosphere over the U.S. (HSDB, 2003). Studies performed at Lake Michigan show that 80 percent of the PCBs entering the lake come from the air (Delta Institute, 2000). Additional evidence of the atmospheric deposition of PCBs is the presence of PCBs in sparsely populated areas of Canada and in Arctic polar bears (both far from point sources of PCB contamination) (Fiedler, 1997).

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Southern California Coastal Water Research Project 1500 East Imperial Highway El Segundo, California 90245 (213) 322-3080

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*Present Address: Lockheed Center for Marine Research 6350-A Yarrow Drive Carlsbad, California 92008

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INTRODUCTION

Vessel antifouling paints constitute a potentially significant source of certain trace contaminants to coastal marine waters. For example, copper, mercury, and lead have been used extensively in bottom paints or primers, and relatively high concentrations of polychlorinated biphenyls (PCB) also have been found in such materials (Barry 1972; Young et al. 1973; McClure, personal communication*). Because of the extensive use of recreational, commercial, and naval vessels off southern California, the Coastal water Project conducted a study of the application of antifouling paints to boats in marinas and harbors along this coast. Samples of the principal brands of paints used were obtained and analyzed for PCB. In addition, when possible, copper content was obtained from the paint can labels. The results of this survey have been incorporated into estimates of annual mass emission rates (or their upper limits) for these potential pollutants, and the values have been compared to past estimates for two other sources.

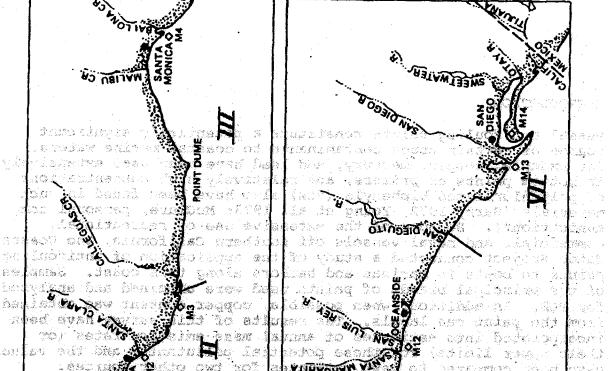
PROCEDURES AND RESULTS

Field Surveys

The southern California coastline has 14 major recreational marinas between Santa Barbara and the U.S./Mexico border (Figure 1); in addition, there are major harbors at Los Angeles and San Diego that contain almost all of the commercial and naval drydock facilities in the region. During 1971, the number of small craft then maintained in each marina was obtained from the appropriate harbor master (Table 1). This inventory was followed by a preliminary investigation into the usage of antifouling paints and other vesselrelated materials in Marina del Rey, the second largest marina in southern California (Southern California Coastal Water Research Project 1973). During 1973, we conducted detailed investigations into antifouling paint usage at four marinas--Ventura Harbor and Oxnard-Channel Islands Harbor (Ventura County), Marina del Rey (Los Angeles County), and Newport Bay (Orange County). anchorages accommodate more than half of the marine recreational craft moored in southern California.

* Dr. Vance McClure, National Marine Fisheries Service, Tiburon, Ca.

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M5	Redondo Beach-King Harbor Marina 1,400
M6 , 1915	San Pedro Bay-Los Angeles Harbor 3,400
M7 Antone M8: bas	San Pedro Bay-Long Beach Harbor 2,530
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ML2	Oceanside Harbor
M1.3	San Diego-Mission Bay 1,500
Ml4	San Diego Bay 3,320
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Information on boat size and type was generally not available; however, we located relatively detailed data on one recreational craft anchorage--Newport Bay.* This bay, which is located in approximately the middle of the Project's coastal study region, harbors almost 25 percent of the total number of small craft anchored in southern California; thus, we felt it would be reasonably representative of the other marinas of interest. Table 2 gives the results of an inventory of the numbers of power, sail, and hand-powered craft in several length classes moored in the Bay during winter 1971. Table 3 presents information on annual counts of craft of a number of different types anchored there between 1962 and 1971.

We used two methods to obtain estimates of the amounts of antifouling paint used. The first was to quantify directly the number of gallons of all major brands applied or sold annually in a marina area. The second was to obtain estimates of the average number of gallons of antifouling paint applied per boat and the number of boats painted annually in the area. In addition, data on the percentage use of each of the major brands was sought. Such information was obtained by visiting all of the boat "haul-out" yards in the marina under study and all of the retail paint and hardware stores in the vicinity of the marina. We obtained samples of paints currently in use and also collected paint scrapings at several of the yards.

During 1973, our detailed survey efforts were first directed to Marina del Rey. Only two haul-out yards and four retail suppliers of antifouling paints were located in the vicinity. Information obtained on principal brands used and estimated application rates is summarized in Table 4.

Following the collection of the information summarized in Table 4, we attempted to evaluate the completeness of the survey of antifouling paint usage on Marina del Rey craft. Paint retailers' estimates of the number of gallons applied per boat (averaging approximately 30 ft (10 m) in length) ranged from 0.5 to 1.5.** Taking an average figure of 1 gal. per boat, and assuming that sales by Retail Store No. 4 (Table 4) were similar to those of the other three local retailers (averaging about 100 gal./yr), the painting of approximately 400 boats is accounted for by retail paint sales. This compares to approximately 4,100 boats painted annually by the two boat yards. In addition, another 300 boats that did not require antifouling paint were inventoried in dry storage. As the

* Larry Miller, Newport Beach Chamber of Commerce, personal communication.

** Estimates from the haul-out yards were somewhat higher, averaging about 1.5 gal./boat.

Length	Power	Sail	H	and-Power	ed	Total
Under 20 ft 20-29 ft	2,000	2,060	n de la companya de	1,040		5,100
30-39 ft	1,200 730	980 430	2			2,180
40-49 ft	360	120			3 P 1 - 2 - 2	1,160 480
Over 50 ft	150	70	C 3		1. 1. 1. 1.	220
TOTAL	4,440	3,660	÷.	1,040		9,140

Estimated Numbers of Power, Sail, and Hand-powered Boats in Five Length Classes -Newport Bay, Winter 1971.

average reported interval between paintings was 12 months, approximately 4,800 (or 80 percent) of the estimated 6,000 craft maintained at Marina del Rey were accounted for in the survey. We do not presently know how much of the remainder is due to unattended craft, to craft painted elsewhere or at a reduced frequency, or to inaccuracies in the usage estimates. However, it does appear that most of the paint applied to small craft anchored in Marina del Rey was accounted for in this survey.

A corresponding approach at the other marinas studied was not possible because our surveys revealed that some of the haul-out yards obtained their paints from local retail stores. However, in light of the fact that about 90 percent of the (accountable) antifouling paint used on Marina del Rey craft was applied by local boat yards, we have assumed that this is the predominant source of antifouling paints utilized on small craft in the marinas. Results on bottom paint usage for Newport Bay and Ventura and Oxnard Harbors are

To obtain estimates of antifouling paints used in southern California on commercial and naval vessels, we visited most of the major drydock facilities in Los Angeles-Long Beach Harbor and San Diego Harbor. Estimates of the quantities and types of major paints applied annually at these drydocks was obtained (Tables 7 and 8). Samples of these paints also were collected and analyzed for PCB.

Laboratory Technique

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<u>Wet Paint Extraction Methods</u>. Most samples were extracted using a separatory funnel. A measured volume of the wet paint sample was pipetted into a 500-ml separatory funnel containing 100 ml of 15 percent diethyl ether in hexane (by volume). If the paint

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Table 4

Estimated Use of Antifouling Paints at Marina del Rey, 1973.

Supplier	Boats/ Year	Average Gal./Boat	Gal./ Year	a Secol Brand	Est. % of Total
Boatyard No. 1	3,000	x 1.5 =	4,500	Brolite Z-Spar Woolsey	50 50
Boatyard No. 2	1,100	[©] x 1.5 ≈	1,650	Brolite Z-Spar Woolsey	50 50
Paint Retailer No. 1	• 100	×4	100	Brolite Z-Spar Woolsey	
Paint Retailer No. 2	50 ⁹	n 1 2004 Maria	50	Brolite Z-Spar Mariner's	95 5
Paint Retailer No. 3	150		150	Brolite Z-Spar International	75 25
Paint Retailer No. 4	100*	12	100**	Brolite Z-Spar Woolsey	- 3 -
TOTAL	4,500	総 11. 登録会 11. 14. 14. 14. 14. 14. 14. 14. 14. 14. 14.	6,550	стания Марияна Собрания Собра Собранния Собранни Собранни Собранни Собранни Собра Собранния	

*Boats per year equals gallons per year divided by average gallons per boat. **No quantitative information released; value assumed from data for Retailers 1 through 3.

seemed to disperse easily when dropped into the ether-hexane mixture, the separatory funnel method of extraction was employed. On the other hand, if the wet paint sample formed a seemingly nonpermeable drop or plastic-like string, the separatory funnel method was not used, and the samples were extracted using the Soxhlet method.

<u>Separatory Funnel Method</u>. The separatory funnel was shaken for a period of 2 minutes with the ether-hexane mixture and the sample. The sample was allowed to settle to the bottom of the separatory funnel, and the extract was carefully decanted into a round-bottomed flask. Next, 100 ml of 6 percent diethyl ether in hexane was added to the 500-ml separatory funnel containing the sample and shaken for a period of 2 minutes. Again the extract was carefully decanted into the round-bottomed flask. The paint was shaken again with 100 ml of hexane, and the extract was again added to the round-bottomed flask. The sample was reduced in a Rotovapor to a volume suitable for a Florisil cleanup.

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Table 5.

Estimated Use of Antifouling Paints at Newport Bay, 1973.

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Supplier	Boats per Year	Avg. Gal./ Boat	Gal./ Year	s	Est. % of Total
Boatyard	s etileta	003, N	and a second second	130 J. J	or historia
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- 6	(110) (110)		140	Brolite Z-Spa	L 3
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7	180	2 0 2	360	Brolite Z-Spa International	
•	200		500	Brolite Z-Spa	
	rre ref bala.			Pettit	
8	500	1.5	750	Brolite Z-Spa	
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teyalama a 10 ylenima 12rnad ys sit eni 11 12	- 100 100 100	30.35.0748 30.35.0748 30.025.0748 30.025 3.4 0.75	790	Mariners Pettit Woolsey International Brolite Z-Spa Woolsey Pettit Brolite Z-Spa Pettit	35 45 10 5 45 45 10 100 100
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Supplier	Boats per Year	Avg. Gal./ Boat	Gal./ Year		and	Est. 9 of Total
Paint	and and a second se				5 19	-
Retailer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ANA SALANA SA				
(Cont.)						
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•				Brolite	tional Z-Spar	-
8	-		900	Brolite	Z-Spar	- 75
			•	Interna		25
9		1	300	Pettit		45
· · ·				Mariner		35
		9. j 2. M	ar ar Ang Barga	Woolsey	n an	10
				Interna	Z-Spar	5
10		-	1	Brolite	Z-Spar	5 100
*No estimat	e avail	able.	Ó	<u> </u>		TOO
<u></u>			*			
		Т	able 6.	•		구 성장
	Est	imated Use		iling Doin	· 동네 : 이번 : 고역 : 이 : 이 : 이 : 이 : 이 : 이 : 이 : 이 : 이 :	
	for	Ventura and	Oxnard Ma	arinas, 19	cs 73.	
	Boats	Avg.		Cy I		Est. %
	pèr	Gal./	Gal./		2	Est. % Of
Supplier	Year	Boat	Year	Bra	nd	Total
VENTURA HARI	BOR		·			
Boatyard	330	1	330	in an	$\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^{n} \frac{1}$	
Paint	감정구령 문		50	Brolite	-Snar	100
Retailer					~ oper	TOO
WINDD / CITIN	1137 - + -			2 ¹¹ 21		
	a see the base of	ANDS HARBOR				
Boatyard	480*	3.25	1,560	. =•		-
Boatvard re	cently	changed own	orchin. +			
pelieved to	signif:	icantly unde	restimate	past and	this esti	mate is
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Table 5 (Continued)

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	Est. % of Total	600	1 4					
	parties and a set of the second s	a an ann an tha an t	onal 1	nolds 080 onal solds				n se
<u>69</u> 3	Brand	International Devoe-Reynolds International	Proline International 1609	Devoe-Reynolds Proline 1080 International	Devoe-Reynolds	Devoe-Reynolds 129/63		i i se Alexandria Bend Antol II. Alexandria Alexandria
mercia Harbor.		-a solia -8 solia 6 bisistros	Prol Inter 1609	008 008	t Devo			
s on Connerci Beach Harbor	Potal	2, 960 4, 650	6,000	2,290	3, 980 3, 980 6, 750	30 , 600	S. Navy)	
Table 7. of Antifouling Paints on Commercial in Los Angeles-Long Beach Harbor.	ons/Year Naval	355** 650 **	hil 9 1 6 O	ang na na mang ng na ng na ng na ng na ng na ng		popu and a the population of the state of the state of the state of the	E.	Constraint a subscription of the Constraint of t
Table 7. ntifoulin Los Angel	Gall	5** 0 4,		, à la. Railteach	0 14650 343 4 07	Active	Shipyard	
of Anti s in Los	Commer- cial	0 9 5 9 9 7 7 7	0 0 0	2000 7 7		in an	t for ords. s 1-4.	inter a comunicación de la comunic
ual Use Vessels	Avg. Gal./ Ship	Antonio Conservatione and Antonio Conservation and Antonio Antonio Conservationa antonio Conservationa antoni Conservat	5000 1 000000000000000000000000000000000	4 4 4	1 10 10 11 10 11 10 11 10 10 11 10 10 10	i stra film som in Honoria i som in Honoria i som og til etter som i som		ing a search ann an
ted Annual d Naval Ve	Year Naval	2 4	0	. 93 O	េរស្ត	ar Ar Sina	l shipyards, y from compa value for Sh	e election Receited Car Category Co ma n
Estimated and N	Ships/Ye Commer- cial N		• •	5,500 	e en norme en		rcial s ectly f age valu	Servysed Postyser String Solution
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	Shipyard*	N H	Μ	4	402	TOTAL	*All are commercial **Obtained directly tAssuming average v	

Estimated Annual Use of Antifouling Paints on Commercial and Naval Vessels at Two of the Largest Shipyards in the San Diego Harbor, 1972 an San Diego Harbor, 1972 an Satar and

金属和 最终的形式 经管理部门的进行方面 化试验

an a	C	ommercia	1	n ne en reelen Ne tradición	Naval	
	Yard 1	Yard 2	Total	Yard 1	Yard 2	Total
Ships per Year	24	3		2	4	a di kana di kana
Average Gallons per Ship	40	3,000	しん ないかい	300 -	500	State of the state of
Gallons per Year	960	9,000	9,960	600	2,000	2,600

Soxhlet Extraction Method. This method was used only when the separatory funnel method could not be used. The wet paint sample was spread out on aluminum foil and allowed to dry. After drying, the sample was extracted using the same method as that used on dry paint samples.

Dry Paint Extraction Method. Dry paint samples were Soxhlet extracted with hexane. The thimbles and hexane were added to the Soxhlet extraction apparatus, and the hexane was refluxed for a period of 2 hours to clean the apparatus. The rinse hexane was removed and replaced with clean hexane, and the samples were weighed into the cleaned thimbles. The Soxhlets were then refluxed for an 18-hour period. The extracts were concentrated in a Rotovapor to a volume suitable for the Florisil clean-up column.

् 🖉 के दिन्द्र 🖓 🖉 Florisil Cleanup. Activation of the Florisil was carried out using a pottery kiln. The temperature was set at a dial reading of $1300^{\circ}F$ (705°C); this temperature setting on the kiln melts aluminum foil (which has a melting point of 659°C) and appears to be a satisfactory setting for the activation of Florisil. The Florisil was placed in 250-ml covered cricibles in the kiln and was baked for 4 hours after the kiln reached equilibrium temperature. The activated Florisil was stored under hexane until use.

eren Berneus n.C.

Three inches of the slurried-activated Florisil were added to the cleanup chromatographic columns, * and 1/2 inch of anhydrous sodium sulfate was added over the Florisil. Samples were concentrated to a volume of approximately 50 ml and added to the Florisil column. The column was eluted with 45 ml of 6 percent diethyl ether in hexane.

Extraction Efficiency. One paint chip sample (Code P17, Table 10) with a high PCB concentration (about 15 percent on a dry weight basis) was extracted and re-extracted with a Soxhlet extraction apparatus. The PCB value for the second extraction was 0.01 percent of the total value of the first extraction. If all dried

* 25 mm o.d., 22 mm i.d., 400 mm length with sealed-in coarse porosity fritted disc, Kontes Glass Co., Vineland, N.J.

paint samples are assumed to have the same permeability, then the procedure for dry paint extraction may be assumed to be highly satisfactory. Because none of the wet paint samples analyzed showed any appreciable concentration of PCB, it was not possible to quantify extraction efficiency for such samples. However, double extractions were conducted on a number of wet paint samples. Based on the relative signals obtained in the double extractions, and the very high recovery observed for the dry paint sample, we concluded that the PCB concentrations (usually upper limit values) listed in Table 9 are representative.

RESULTS

Sample descriptions, measured PCB concentrations, measured densities, weight percentages of copper compounds listed on paint can labels, and estimated metallic copper content are and presented in Table 9. Table 10 lists PCB concentrations measured in weathered antifouling paint samples obtained at boat haul-out yards.

的复数 计正式编辑 氟化氨 建化合物 医糖样的 解散的 Because no DDT compounds were ever identified in the paint samples, upper limit concentrations were not calculated. Such values could be estimated to be approximately one-tenth of the maximum PCB 1254 values. ar 1 - 麗田市 (田島) 親一 一个月 资本代表

DISCUSSION

DISCUSSION Antifouling Paint Usage

and a constant would be the second states where a state of a column of the state the As seen from the data presented in Table 1, the 1971 inventory of small craft harbored at marinas throughout the Bight generally was confirmed by the 1973 inventories conducted at Oxnard Harbor, Marina del Rey, and Newport Bay. The percentage increases in numbers were 5, 9, and 7 percent, respectively. Assuming that the median value of 7 percent for percentage increase over the 2-year period is representative, approximately 37,000 recreational boats* were harbored in southern California marinas during 1973. The intensive surveys conducted at Marina del Rey and Newport Bay, which together account for about 40 percent of this total, yielded remarkably similar results. For example, the 4,100 small craft painted in the two boatyards at Marina del Rey during 1973 consti-tuted 68 percent of the total number of boats (6,000) harbored there. In comparison, the 5,630 small craft painted at the 12 boatyards at Newport Bay constituted 66 percent of the total number (8,600) harbored at the Bay during 1973. Similarly, the median values for estimated gallons of antifouling paint applied per boat at both anchorages and for both haulout yards and paint retailers were 1 gal./boat.

As discussed in the previous section, at Marina del Rey, the boatyards apparently accounted for about 90 percent of the antifouling paint used at the marina, and retail sales to individuals for pri-

* Generally between 16 and 65 ft (5 to 22 m) in length.

			VI CONCE				• • •
100 C	Concentrations in	Antifouling P	Paints	Used in Southern	l Estimated Cop lern California	d Copper ornia.	
Code	Brand and	Extrac- tion Method*	PCB (mg/ 1242	PCB (mg/1) 0 1 2 5 4	Cu20 (120)	d	G
ecrea	Recreational stores 2				(%)	(KG/L)	(3/1)
	Brolite Z-Spar						
P23		А	<0.06	<0.16	32.6	1 73	
P34	Mulei tox Colortox	A B	<0.05	о Н с	່. ທີ່	1.70**	540
P50	Supertox	1		5.0	ۍ و		o
P53		Å	<0_3	<0.6	4, c 7, 0 4, 0	1.70**	006
r40 D37	Racing Bronze	24). 1			26-7+	1.13	1, U40
P37	VINY COP	20 ₹ 1		ਂ ਦ		1	2 2 2 2 2 2 2 2 2 2 2 2 1
			オ・ンノ	2.12	1	1	• B
24	Vinalset (51)						
139 139		Å	۳ 0- 0-	0°17 √	- 13 6	1.63	610
्राम्	OTT D	4 I	T->^>	۳.0×	42.0	2.08	780
P44	Tradewinds		•	-	++0	1	0
P46	Racing Finish	1			44 • C		000
1	Super-Vinelast	1	•		48.05	•	0000
ר גי גי	Neptune	1	100 - 100 -		68.0	•	0000
	Foul-Ban	.1			40.0	L-70**	т, 620 600
Q	International.					- - -	
0 0	27 0	щ	<0.2	<0.6	31.5	1 70**	007
027	Bottomkote 69	A	4	<1.1	43.5	ν O	00 4 00
010		4	03	<0.07	45.0		00 0 0 0 0 0 0 0
		ند ۳		<1.0 <1.0	Ô	-	
		A	<0.06	<0.15	67.5	2.83	1,700
A = A	mothod.	1			31,5	I.70**	480
ho		19TUXOC = d	TPercent	~서 ~서	c copper.		
**Median	an density assumed.		SULTS SPLUS	SPLus 3% CuOH.			
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Type Method: 1242 $mg/1$, 1254 $mg/2$ mg							
Nov Nov <th></th> <th>LION Method*</th> <th>(m 1242</th> <th>ੂਰ ਜ</th> <th>Cu20 (%)</th> <th>р (Тъся/1)</th> <th></th>		LION Method*	(m 1242	ੂਰ ਜ	Cu20 (%)	р (Тъся/1)	
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Icide red - 0 - 0 Tille A <0.3	Old Salem	.		4	ດ ມ ງັນ	0 -	520
Title - 0 - 0 rido A <0.3	Vinylcide red				Ŭ Ĵ		540
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Table 9 (Continued)

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in Bottom Paints Jocks .	PCB (mg/dry kg) 1242 [1254	ж х х х х х х х х х х х х х	
e 10. Biphenyls Measur thern California		Scrape Scrape Scrape Scrape Scrape Scrape Scrape Scrape	
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vate use accounted for the other 10 percent. Applying this factor to the boatyard statistics presented above, it is estimated that approximately 75 percent of the boats inventoried in the marinas of the Bight are painted annually, using on the average about 1 gal. of antifouling paint per boat. This implies that the application rate of antifouling paints to recreation craft along the southern California coast during 1973 was approximately:

37,000 boats inventoried x 0.75 boats painted per year boats inventoried

x 1 gallon paint boats painted

= 28,000 gal./yr*

Regarding the annual use of antifouling paint for commercial and naval vessels, as seen in Table 7, the estimated total for Los Angeles-Long Beach Harbor (San Pedro Bay) is 30,600 gal./yr. Table 8 presents data obtained for 1972 from records of the two largest shipyards in San Diego Bay; approximately 12,600 gal. of antifouling paint were used at these yards during that year. These results are in excellent agreement with those reported by Barry (1972) for the previous year; during 1971, a total of approximately 13,000 gal. of antifouling paint were applied to commercial and naval vessels in these two yards. As Barry's data imply that the total value for such vessels (excluding recreational craft) painted during 1971 in the Bay was approximately 19,400 gal., the estimated total annual use of antifouling paint on commercial and naval vessels at shipyards in the two bays is:

San Pedro Bay = 30,600 gal./yr San Diego Bay = <u>19,400 gal./yr</u> Total = 50,000 gal./yr

These two harbors contain the major shipyards located along the southern California coast.

PCB and Copper Inputs

As seen from Table 9, PCB 1242 or 1254 were detected in only 7 of the 28 wet paint samples analyzed. With the exception of Samples P54 and P63, whose total PCB concentrations each were approximately 40 mg/l, levels generally were the order of 1 mg/l or below. (Neglecting inequality signatures in Table 9, median values for PCB 1242 and 1254 were 0.3 mg/l and 0.7 mg/l, respectively.) When we combine these median values with the estimated quantities of antifouling paint applied annually to recreational, commercial, and naval vessels in marinas or harbors of the Bight, we obtain the estimated upper limits for PCB annual usage at each of the southern California anchorages shown in Table 11.

* One gallon equals 3.78 liters.

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A corresponding calculation may be made for estimated copper usage. From the data presented in Table 9, the following summary of copper concentrations in antifouling paints is obtained:

<u>Class</u>	, dap te :	No. of	Values.	an a	<u>Cu</u> (g/	1)	
Recreational	de estar	(area) 2 9	ang. Tang	An ann th' Al th	Median =	550	
en de la construcción de la constru La construcción de la construcción d La construcción de la construcción d	and the property of the second second		And State State State Street States	an a	Mean ≃	an ann a san a bhaile an an Albhaile an	
Commercial		. () 9 1) 9	1 8. 9 8. 0		Median =	and the contract of a	
	₹.				Mean = S _x	540	2 2 2
Navy 8		2 2 2 2 2		1999 (S. 1997 (S. 19 1918 (S. 19		690-1,090	
	ter production of the second s					890 200	
Combined	ан Алан Алан Алан Алан Алан Алан Алан Алан	40			Median ≞ Range =	550 0-1,700	
	3.5 26.				Mean S- x ≈ ⇒	650) 650	1
		•					

These results are in reasonable agreement with those of Barry (1972); from his data, median concentrations for the above four categories are 610 (n = 21), 670 (n = 6), 1240 (n = 2), and 640 (n = 29)Although the naval vessel paints apparently contain somewhat more copper than do most paints used on the other types of craft, the results are generally quite similar. Until better data on usage of individual paints become available, it appears adequate to apply an average value for the copper content of antifouling paints used in the Bight. Combination of the results from Barry's study (overall median = 550 g/1) and from our study (overall median = 640 g/1) results in an estimated typical copper level of about 600 g/1. Using this figure, the estimated annual application rates of copper to vessel bottoms in each anchorage of the Bight have been calculated and are also listed in Table 11.

In Table 12, potential input rates of PCB and copper to the Bight through vessel paints are compared to those estimated for municipal wastewater (1971 data) and surface runoff (Water Year 1971-72) entering our coastal waters (Southern California Coastal Water Research Project 1973).

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Table 11.

Estimated Annual Application Rates of PCB 1242, PCB 1254, and Copper to Recreational, Commercial, and Naval Vessels via Antifouling Paints at the Major Marinas and Harbors of the Bight, 1973.

	Medien + 550	Paints*	PC	s ^c (g /y r)**	Coppert (metric
Area	Anchorage	(gal./yr)	1242	1254	Total	tons/yr)
I	Santa Barbara Harbor	600	0.7	1.6	2.3	1.4
II ()	Ventura Harbor Oxnard Harbor	750 750	0.8 0.8	2.0 2.0	2.8	1:7
III	Marina del Rey Redondo-King Harbor	4,410 1,120	5.0 1.3	12 3.0	17 4.3	10 2.5
V	Huntington San Pedro Bay Newport Bay	37,200 6.410	2.9 42 7.3	6.8 98 17	9.7 140 24.3	5.8 🗸 % 84 15
VI	Dana Point Harbor	440	0.5	1.2	1.7	1.0
	Oceanside Harbor		0.5	1.2	1.7	10 1.05000
VII	Mission Bay San Diego Bay	1,200 22,100	1.4 25	3.2 58	4.6 83	2.7 50
	TOTAL	77,980	•		<294	177

*Assuming (1) a 7% increase in the 1971 inventory values for recreational craft listed in Table 1; (2) 75% of the recreational craft are painted annually, using an average of 1 gal. of antifouling paint per boat. The values for San Pedro Bay and San Diego Bay (30,600 and 19,400 gal./yr, respectively) include estimates for commercial and naval vessels. One gallon is equivalent to 3.78 liters. **Upper limit figures, based on median values not exceeding 0.3 and 0.7 mg/l for PCB 1242 and PCB 1254, respectively. TAssuming that, on the average, the concentration of copper in antifouling paint is about 600 g/l.

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in Andrea 12. potential input reteat of 206 and appres to the Bigin threach venuel politic are compared to these estimated for municipal statement (1971 Antal End surface runoli (Mater Year 1971-77) suppring our coastal veters (northam calificatele Coastal Metar Seastan Prifect 1972). Table 12. Estimated recent annual input rates of PCB and copper to seven coastal areas of the Bight via municipal wastewaters and surface runoff, and estimated application rates of vessel antifouling paints.

Area	Waste- Waters	1 Ist Topics	Paints	Waste-	it oola koo	
I.			0.01	2	0.6	1.4
II	3	10	0.01	1	8	3.4
III	570	18	0.02	190	- 3 2.88	
IV	6,000		10、15万 <u>建</u> 整运动学生和			
V	3,000	214	0.17	6 6	MRO6 No de	105
VI	ent Torre At orte	1976 2 13 2013) 1976 - 2 13 2014	0.01	sioly and r Sola and r		2.0
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OTAL	9,700	250	0.3		19	

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Because 1971-72 was an unusually dry year, the estimated inputs for surface runoff (Table 12) are thought to be lower by about a factor of two than those that would have occurred under normal rainfall conditions. Also, source control efforts by the municipal wastewater managers apparently have now reduced the 1971 total PCB annual inputs by about a factor of two or three. Nevertheless, it is apparent that surface runoff probably is not an important source of either PCB or copper relative to municipal wastewater inputs.

While use of antifouling paints obviously now contributes a trivial amount of PCB to the harbors of the Bight (Table 12), the potential input (application rate) of copper via antifouling paint is seen to be quite significant. Overall, this potential input is about one-third the total estimate for municipal wastewater, and in Area V (San Pedro Basin) and Area VII (San Diego), it exceeds the wastewater value. Although we cannot yet estimate with any reliability what fraction of the copper contained in antifouling paint actually is released to the marine environment, the fact that this

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toxicant is deliberately added to the paint (in a matrix designed to gradually release the toxicant) to prevent fouling by marine invertebrates suggests that an important fraction of the copper applied is indeed released to the marine environment before repainting. In addition, during repainting, a significant fraction of bottom scrapings may be blown or washed into the harbor water.

There is some indication that copper concentrations in digestive glands of the intertidal mussel and in the liver tissue of Dover sole collected from the vicinities of the major harbors in the Bight are somewhat higher than estimated baseline concentrations (Figures 8-19 and 7-14, Southern California Coastal Water Research Project 1973). This hypothesis is now being further investigated.

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Office of Enforcement and Compliance Assurance EPA 315-B-00-001 Summer 2000

A Guide for Ship Scrappers Typs for Regulatory Compliance

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1. INTRODUCTION

What is ship scrapping? According to OSHA, ship dismantling or breaking is "any breaking of a vessel's structure for the purpose of scrapping the vessel, including the removal of gear, equipment, or any component of a vessel" (29 CFR 1915.4).

1.1. THE GUIDE

What It Is; What It Does

This guide is intended to provide the site supervisor of a ship scrapping facility with a good understanding of the most pertinent *federal* environmental and worker safety and health requirements affecting ship scrapping/ship breaking operations. (*Specific* state requirements are not included.) The document provides guidance with reference to specific regulations, tips in shadow boxes • , and regulatory inspector highlights denoted by check boxes **V**.

Organization of the Guide

This guide is organized into 9 sections and 3 appendices. The document begins with a brief introduction and is then followed by a series of sections, each presenting key environmental and worker safety and health requirements for a major ship scrapping process. Each section was designed and developed to be used as independent guidance. These sections are as follows:

- Section 2. Asbestos Removal and Disposal
- Section 3. Sampling, Removal and Disposal of Polychlorinated Biphenyls
- Section 4. Bilge and Ballast Water Removal
- Section 5. Oil and Fuel Removal and Disposal
- Section 6. Paint Removal and Disposal
- Section 7. Metal Cutting and Metal Recycling
- Section 8. Removal and Disposal of Miscellaneous Ship Machinery

Section 9. Resources identifies sources, such as general and process-specific contacts, hotlines, publications, and Internet sites, where additional information and/or assistance can be obtained on environmental and worker safety and health requirements.

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3. SAMPLING, REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBS)

The sampling, removal, storage, and disposal of polychlorinated biphenyls (PCBs) is a primary environmental concern, as well as a worker health and safety concern, for your facility during ship scrapping. As described below, PCBs are found throughout older vessels and it is likely your ship scrapping facility will be faced with managing large quantities of PCBs. The following sections present background information on PCBs, discuss the effects of exposure to PCBs, and describe some of the regulatory requirements with which your facility must comply.

3.1 INFORMATION ABOUT PCBs

What are PCBs?

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. They are basically mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties. PCBs, which were domestically manufactured from 1929 until their manufacture was banned in 1979, can range in toxicity and vary in consistency from thin light-colored liquids to yellow or black waxy solids. While sold under the trade name "Arochlor," PCBs are known by many trade names. Common trade names for PCB dielectric fluids include, but are not limited to:

Aroclor	Clorphen	Hyvol	Pydraul
Aroclor B	Clophen	Inclor	Phyralene
Apirolio	Diaclor	Inerteen	Pyranol
Asbestol	Dk	Kaneclor	Pyroclor
Askarel*	Dykanol	Kennechlor	Saf-T-Kuhl
Adkarel	EEC-18	No-Flamol	Santotherm FR
Chlorextol	Elemex	Nepolin	Santovac 1 and 2
Chlorodiphenyl	Eucarel	Nonflammable Liquid	Therminol
Chlorinol	Fenclor	Phenoclor	

A Guide for Ship Scrappers: Tips for Regulatory Compliance * Askarel is the generic name used for nonflammable insulating liquid in transformers and capacitors.

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Why were PCBs widely used?

Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper; and many other applications. More than 1.5 billion pounds of PCBs were manufactured in the United States before production was stopped in 1979.

Where can PCBs be found on a ship?

Although no longer commercially produced in the United States, PCBs are found in solid (waxy) and liquid (oily) forms in equipment and materials on ships being scrapped. These equipment and materials which may contain PCBs in concentrations of at least 50 parts per million (ppm) include:

- Cable insulation
- Rubber and felt gaskets
- Thermal insulation material including fiberglass, felt, foam, and cork
- Transformers, capacitors, and electronic equipment with capacitors and transformers inside
- Voltage regulators, switches, reclosers, bushings, and electromagnets
- Adhesives and tapes

- Oil including electrical equipment and motors, anchor windlasses, hydraulic systems, and leaks and spills
- Surface contamination of machinery and other solid surfaces
- Oil-based paint
- Caulking
- Rubber isolation mounts
- Foundation mounts
- Pipe hangers
- Light ballasts
- Any plasticizers

How can exposure to PCBs occur?

PCBs can be ingested, inhaled, or absorbed through the skin. They circulate throughout the body and are stored in the body's fatty tissue. There are OSHA regulations governing exposure to PCBs in the workplace.

What are the dangers of exposure to PCBs?

PCBs are toxic and persistent. They have been shown to cause a variety of adverse health effects, such as cancer in animals, as well as a number of serious noncancer health effects in

animals (e.g., effects on the immune system, reproductive system, nervous system, and endocrine system). Studies in humans provide supportive evidence for potential carcinogenic and non-carcinogenic effects of PCBs. The different health effects of PCBs may be interrelated, as alterations in one system may have significant implications for the other systems of the body. In some cases, chloracne may occur in humans exposed to PCBs. Severe cases of chloracne are painful and disfiguring, and may be persistent.

It is very important to note that the composition of a PCB mixture changes following its release into the environment. The types of PCBs that bioaccumulate in fish and animals and bind to sediments tend to be the most carcinogenic components of PCB mixtures. As a result, people who ingest PCB-contaminated fish or animal products and touch PCB-contaminated sediment may be exposed to PCB mixtures that are even more toxic than the PCB mixtures contacted by workers and released into the environment.

EPA is also very concerned about the toxicity of the chemicals produced when PCBs are heated in fire-related incidents. The chemicals produced include polychlorinated dibenzofurans and polychlorinated dibenzo-p-dioxins, both of which are believed to be much more toxic than PCBs themselves.

3.2 WHO REGULATES PCBs?

EPA. The Toxic Substances Control Act (TSCA) enacted in 1976 regulates commerce and protects human health and the environment by requiring testing of and establishing

Note: Some states may regulate PCBs as hazardous wastes.

restrictions on certain potentially hazardous chemicals, including PCBs. PCBs are considered by EPA to be an unreasonable risk to health and the environment. Essentially, TSCA legislated true "cradle to grave" (i.e., from manufacture to disposal) management of PCBs in the United States.

Under Section 6(e) of TSCA, EPA is required to control the manufacture, processing, distribution in commerce, use, and disposal of PCBs. The TSCA regulations detailing the management requirements for PCBs are found in 40 CFR 761. Part 761 provides the definition, storage and disposal, cleanup policy, exemptions, general housekeeping, and reporting requirements for PCBs. EPA published amendments to 40 CFR 761 in the June 29, 1998 Federal Register [63 FR 35383-35474] which are broad and affect the sampling, analysis, and disposal of PCBs. The new amendments were effective August 28, 1998, and can be accessed at http://www.epa.gov/opptintr/pcb.

Sampling, Removal and Disposal of PCBs

4. BILGE AND BALLAST WATER REMOVAL

An important activity during ship scrapping is the proper removal and disposal of wastewater, specifically bilge water and ballast water. The activities, if not conducted properly, may impact the environmental and present health and safety concerns for your workers.

4.1 INFORMATION ABOUT BILGE AND BALLAST WATER

The following section describes bilge water and ballast water, where they are found on a ship, and the potential human health and environmental impacts if they are not managed properly during removal and disposal.

What is <u>bilge</u> water and where is it found on a ship?

Typically, government-owned ships received for scrapping have minimal bilge water onboard. **Bilge water** consists of stagnant, dirty water and other liquids, such as condensed steam, and valve and piping leaks, that are allowed to drain to the lowest inner part of a ship's hull (i.e., the bilge). Bilge water may also be found in onboard holding tanks, often referred to as oily waste holding tanks or slop tanks.

Bilge water originates from many sources both when a ship is in operation and when a ship is being scrapped. It may contain pollutants, such as oil and grease, inorganic salts, and metals (e.g., arsenic, copper, chromium, lead, and mercury). When a ship is in operation, bilge water may originate from leaks and spills, steam condensate, and boiler blowdown. This drainage may include small quantities of oils, fuels, lubricants, hydraulic fluid, antifreeze, solvents, and cleaning chemicals. During ship scrapping, bilge water is created through the accumulation of rain water (because the decks are open) and the collection of water from fire lines that leak, are left open or are used to wet down compartments. Additional bilge water may be generated during asbestos removal and metal cutting activities.

M hat is <u>ballast</u> water and where is it found on a ship?

Ballast is typically water (e.g., port water, sea water) that is intentionally pumped into and carried in tanks to adjust a ship's draft, buoyancy, trim, and list, and to improve stability under various operating conditions. There can be several kinds of ballast water onboard a ship during its operation, including:

4-1

Clean ballast. Clean ballast is seawater that has been pumped into dedicated ballast tanks. Because these tanks are dedicated to ballasting operations, the seawater is not mixed with fuel or oil. Clean ballast water may contain pollutants, such as metals (e.g., iron, copper, chromium) and

Types of Ballast: Ballast can consist of materials other than water, such as mud or concrete. Mud ballast usually refers to drilling mud used in the petroleum drilling industry to lubricate drill bits and remove drilling debris. This type of ballast is typically treated with lubricants and corrosion inhibitors. The term mud ballast may also refer to concrete, rock, water, and other forms of locked-in ballast.

chemical constituents. These can come from additives (e.g., flocculant chemicals that facilitate the separation of suspended silts) or from contact of the water with the piping systems and ballast tank coatings (e.g., epoxy coatings and rust inhibitors containing petroleum distillates). The concentration of these pollutants is expected to increase the longer the water is in the clean ballast system.

Compensated fuel ballast. During a ship's operation, compensated fuel ballast is seawater that is taken in by the ship to replace fuel as the fuel is used, thereby maintaining the ship's stability. The tanks are always full of fuel, seawater, or a combination of both. Depending on the seawater to fuel ratio at the time of scrapping, pollutants in compensated fuel ballast may include fuel, fuel additives (e.g., biocides added to control bacterial growth in the fuel oil), oil and grease, petroleum hydrocarbons and metals, which may result from leaching and corrosion of the fuel containment systems.

Dirty ballast. Dirty ballast is created when seawater is pumped into empty fuel tanks for the purpose of increasing ship stability. The seawater mixes with residual fuel producing "dirty" ballast. Pollutants in dirty ballast may include residual fuel, fuel additives (e.g., biocides), oil and grease, petroleum hydrocarbons, and metals (e.g., copper, nickel, silver, and zinc).

Chromated ballast water: Sodium chromate may be added to ballast water to prevent algal growth at the time of vessel layup.

Mhat are the potential impacts of bilge and ballast water discharges?

During a ship's operation, bilge and ballast water are routinely discharged by ships operating in U.S. coastal waters on a daily basis as regulated by the U.S. Coast Guard (USCG). The

criteria for a ship's discharge is 15 ppm total petroleum hydrocarbons (TPH). Through process knowledge, it is known that the presence of PCBs, oils, and Resource Conservation Recovery Act (RCRA) metals in regulated concentrations is not a standard occurrence. However, in the event that these pollutants are present at elevated concentrations in discharged bilge water and ballast water, there may be potential impacts to serious human health and environmental impacts. These are as described below:

- Bilge and ballast water may both contain **metals** which cannot be removed through treatment or environmental degradation. Metals, if ingested, can cause various human health problems such as lead poisoning and cancer. Additionally, consumption of contaminated seafood has resulted in exposure exceeding recommended safe levels.
- Bilge water may contain **toxic organics**, such as solvents and polychlorinated biphenyls (PCBs), which can be cancer-causing and lead to other serious ailments, such as kidney and liver damage, anemia, and heart failure. Discharges of toxic organics can also result in the release of poisonous gas, which occurs most often when acidic wastes react with other wastes in the discharge.
 - Bilge water may contain **oils and fuels** which can poison fish and other marine organisms. Since these pollutants can float on the water's surface and be blown into the shoreline, they can physically cover plants and small animals thereby interfering with plant life cycles and the animal's respiration. Birds, fish, and other animals are known to abandon nesting areas soiled by pollution.
 - Ballast water has the potential to contain **plants and animals**, including microorganisms and pathogens, that are native to the location where the water was brought aboard. When the ballast water is transported and discharged into another port or coastal area, the

surviving organisms have the potential to impact the local ecosystem. The invasion of nonindigenous aquatic species (see box) is an environmental concern with ballast water discharges into U.S. harbors as it can cause significant changes to ecosystems, upset ecological balances, and cause serious

An Example of a Nonindigenous Aquatic Species - the Zebra Mussel. The most infamous ballast water stowaway is the zebra mussel. Originally from the Baltic Sea, and transferred commercially after the United States government lifted the Russian grain embargo in 1981, it now flourishes in the Great Lakes. Since 1991, the mussels have been altering the entire food web by removing vast amounts of basic food material from the ecosystem. economic harm to U.S. marine, agricultural and recreational sectors.

4.2 WHO REGULATES BILGE AND BALLAST WATER REMOVAL?

Regulations governing the removal and disposal of bilge and ballast water and related activities (e.g., tank cleaning) are important for the protection of environment as they reduce the amount of pollutants released into the environment through wastewater and ensure proper management of wastes produced from wastewater treatment. Regulations also protect workers performing bilge and ballast removal activities (e.g., handling hazardous waste, performing tank cleaning in confined and enclosed spaces and dangerous atmospheres) during ship scrapping.

EPA. EPA has regulatory oversight authority of bilge and ballast water discharges, under the following federal laws:

S

Clean Water Act (CWA). The CWA regulations establish limits on the pollutants that can be discharged by direct dischargers, including publicly-owned treatment works (POTW), and indirect dischargers.

Direct dischargers. Direct dischargers are regulated under the National Pollutant Discharge Elimination System (NPDES) program (40 CFR 122). The NPDES program requires that all point source discharges to waters of the United States are covered under an NPDES permit. As of December 1999, EPA has authorized 43 states and one territory to administer the NPDES program.

Indirect Dischargers . If your facility is an indirect discharger, it discharges wastewater into a sewer system that leads to a municipal treatment plant, also known as a POTW. The POTW typically is owned by the local municipality or a regional board or sewer authority. To address indirect discharges from industries to POTWs, EPA established the National Pretreatment Program as a component of the NPDES permitting program. The National Pretreatment Program is designed to reduce the level of pollutants discharged by industry and others into municipal sewer systems (which lead to POTWs), and thereby, reduce the amount of pollutants released into the environment through wastewater. The program requires industrial and commercial dischargers to treat or control pollutants in their wastewater prior to discharge to POTWs (40 CFR 403).

6. PAINT REMOVAL AND DISPOSAL

This section will address the removal and disposal of paints and other preservative coatings prior to metal cutting. Please note that in the context of ship scrapping, the removal of paints prior to cutting may, in certain circumstances, not be necessary. However, in those situations where it is necessary, there are specific requirements that must be followed. In addition, the removal of paints generates waste that must be managed and disposed of according to the appropriate solid waste and/or hazardous waste regulations.

6.1 INFORMATION ABOUT PAINTS AND PAINT REMOVAL

What types of paint and coatings are found on ships?

Paint and preservative coatings can be found on both interior and exterior surfaces of a ship. Particularly on older ships, paint may be flammable or may contain toxic compounds, such as polychlorinated biphenyls (PCBs), heavy metals (e.g., lead, barium, cadmium, chromium, and zinc), and pesticides. Lead compounds, such as red lead tetraoxide (Pb_3O_4) and lead chromate, have been used extensively in marine paint. In general, metal-based paints, some containing as much as 30 percent heavy metals, were intended to protect ship surfaces from corrosion due to exposure to the elements. Other paints containing pesticides, such as tributyl tin and organotin, have been used on the hulls of ships to prevent the buildup of sea organisms (e.g., bacteria, protozoa, barnacles, and algae).

Methods used to remove paints and coatings

Paints and coatings are typically removed using one of these three methods:

Chemical stripping. Chemical stripping basically involves using solvents, such as methyl ethyl ketone and 1,1,1-trichloroethane, to remove the paint or coating. Solvents, which may be toxic or flammable, can be sprayed, wiped, or brushed on the surface and then removed, along with the paint or coating, using rags or wipes. Wastes generated from chemical stripping include contaminated or spent solvent, solvent residue or sludge, solvent-contaminated wipes/rags, and waste paint.

Abrasive blasting. Using this method, paints and coatings are removed by blasting a surface with abrasives, such as copper slag, coal slag, steel grit, mineral grit, and steel shot. Blasting generates large amounts of dust, abrasive waste, and paint chips.

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Mechanical removal. This involves the use of power tools or flame to remove paints and coatings. The use of power tools, such as grinders, wire brushes, sanders, chipping hammers, needle guns, rotary peening tools, and other impact tools, generates waste such as dust and paint chips. Flame can also be used to remove certain paints or hardened preservative coatings, however, it should not be used on greasy or soft preservative coatings, or paints containing PCBs (see box).

The human health and environmental impacts associated with removing paints and coatings

Chemicals and solvents used in stripping paints or coatings emit volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) to the atmosphere. Other removal methods (e.g., mechanical removal, abrasive blasting) generate dust, particulate matter, and emissions containing lead and

Tip: Paints containing PCBs cannot be removed with a torch or flame. This is considered open burning and is prohibited. Only non-thermal methods can be used to remove paints containing PCBs.

other contaminants. These pollutants are hazardous to human health, potentially causing acute and chronic toxic effects in workers and possibly causing cancers. For example, lead can cause poisoning and long-term damage to the central nervous system. Though they can be absorbed and ingested, the main pathway of concern for these pollutants is inhalation.

Wastes (e.g., blasting residue, paint chips) generated from paint removal can have negative impacts on the environment if they are not properly contained and disposed of. If not contained by engineering controls, lead and other compounds from the waste may be discharged into nearby surface waters or may contaminate the soil at a facility.

6.2 WHO REGULATES PAINT REMOVAL AND DISPOSAL ACTIVITIES?

The activities associated with the removal and disposal of paint and other coatings are regulated because of their potential to release toxic pollutants, thereby potentially endangering both human health and the environment.

EPA. EPA regulates paint removal and disposal activities through the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA). Facilities that emit regulated

Note: If paint contains PCBs, it may be regulated under the Toxic Substances Control Act (TSCA) at 40 CFR 761.

amounts of air pollutants must obtain the appropriate permit and comply with all

A Guide for Ship Scrappers: Tips for Regulatory Compliance

Paint Removal and Disposal



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This document is one section from the "National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs," published in May 2006. The reference number is EPA 842-B-06-002. You can find the entire document at http://www.epa.gov/owow/oceans/habitat/artificialreefs/index.html.

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POLYCHLORINATED BIPHENYLS (PCBs)

<u>Narrative Clean-up Goal</u>: Remove all manufactured products containing greater than or equal to (\geq) 50 parts per million (ppm) of solid PCBs; remove all liquid PCBs regardless of concentration; remove all materials contaminated by PCB spills where the concentration of the original PCB source is \geq 50 ppm.

PCBs belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. PCBs, which were domestically manufactured from 1929 until their manufacture was banned in 1979, have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

What are the potential environmental impacts of PCBs?

PCBs have been demonstrated to cause a variety of adverse health effects. PCBs have been shown to cause cancer in animals and have also been shown to cause a number of serious noncancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system, and other health effects. Studies in humans provide supportive evidence for potential carcinogenic and non-carcinogenic effects of PCBs. The different health effects of PCBs may be interrelated, as alterations in one system may have significant implications for the other systems of the body. EPA's peer reviewed cancer reassessment concluded that PCBs are probable human carcinogens. In addition, PCBs are persistent and bioaccumulative. PCBs bioaccumulate in fatty or lipid-rich tissues. PCBs have a limited solubility in aqueous solutions and PCBs can leach into a marine or aqueous environment (sediment and water column) where they can be taken up by organisms in the food web. PCBs bioaccumulate in fish and other animals; PCBs also bind to sediments. As a result, people who ingest fish may be exposed to PCBs that have been released into the environment and bioaccumulated in the fish they are ingesting.

There is a risk of human exposure during vessel preparation and after sinking the vessel. During vessel preparation, typical routes of human exposure include inhalation, accidental ingestion, or dermal contact. After sinking, exposure routes may be limited to accidental ingestion of or contact with contaminated water and sediments, or ingestion of contaminated fish, shellfish, or crustaceans. (See Appendix C)

Where are PCBs found on a ship?

Although no longer commercially produced in the United States, PCBs are most likely to be present in vessels deployed before the 1979 PCB ban. For such vessels, PCBs may be found in both the solid (waxy) and liquid (oily) forms in equipment and materials onboard ships. The equipment that may contain PCBs in concentrations of \geq 50 ppm and the manufactured products containing \geq 50 ppm of solid PCBs, include:

Materials and items that could contain solid PCBs

- Cable insulation
- Rubber and felt gaskets
- Thermal insulation material including fiberglass, felt, foam, and cork
- Voltage regulators, switches, reclosers, bushings, and electromagnets

- Electronic equipment, switchboards, and consoles
- Adhesives and tapes
- Oil-based paint
- Caulking
- Rubber isolation mounts
- Foundation mounts
- Pipe hangers: More and the the measure have a territory was
- Plastics

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Materials and items that could contain liquid PCBs

• Oil used in electrical equipment and motors, anchor windlasses, hydraulic systems, and leaks and spills from such items

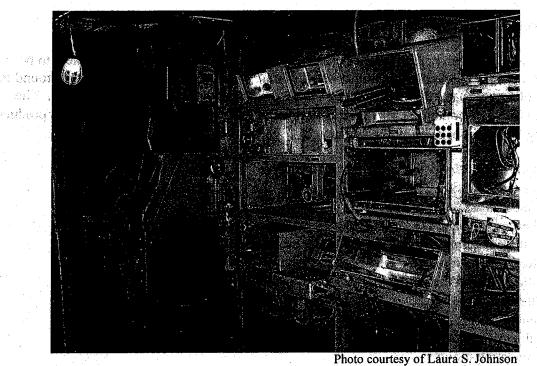
Materials and items that could contain either liquid or solid PCBs

• Transformers, capacitors, and electronic equipment with capacitors and transformers inside

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- Fluorescent light ballasts
- Surface contamination of machinery and other solid surfaces

Items containing PCBs may be found throughout a ship and are not always easily identifiable or readily accessible. PCBs may be found in a variety of shipboard materials, but the location and concentration can vary from item to item and within classes of items. PCB-containing materials also are likely to vary from ship to ship, and even ships in the same class can contain differing types and amounts of PCB-containing materials. While these materials may be found throughout a ship, several areas on ships may have an increased likelihood of containing PCB-bearing materials: areas or rooms subject to high heat or fire situations such as boiler rooms, engine rooms, electrical/radio rooms, weapons storage areas, or areas with hydraulic equipment. Be aware that these pieces of equipment or systems are vulnerable to leaks and spills, which could leave spill residues behind and contaminate porous materials (e.g., carpet, wood, rubber/plastic mats, paint).



Ex-USS Oriskany electronic equipment stripped of capacitors and transformers.

How should the vessel be prepared; what are the appropriate BMPs for PCBs?

PCBs are regulated for disposal under 40 CFR Part 761, and will be discussed in this context. The PCB regulations require manufactured products containing \geq 50 ppm of solid PCBs (PCB bulk product waste) and materials contaminated by spills of liquids containing PCBs (PCB remediation waste) to be properly disposed. Although the ship itself is being "reused" or "recycled" as an artificial reef, the PCBs must be properly disposed. Disposal requirements for each type of PCB waste are referenced below (also see Appendix B).

Where there is reason to suspect that equipment or manufactured products containing solid PCBs may contain $PCBs \ge 50$ ppm, either remove the equipment or component from the vessel, or provide proof that the equipment or component is free of PCBs, unless a PCB bulk product waste disposal approval has been obtained under 40 CFR 761.62(c) (see below).

Under TSCA regulations, a spill of liquids containing PCBs \geq 50 ppm is considered an illegal disposal of PCBs. Material(s) contaminated by such a spill must be cleaned or removed and disposed of, unless a risk-based disposal approval has been obtained under 40 CFR 761.61(c). Spill residues and materials contaminated by these spills are regulated differently than bulk product waste (see below).

The design and implementation of a representative sampling and analytical plan can help determine the presence or absence of PCBs in materials containing solid PCBs at \geq 50 ppm or materials containing PCBs as the result of spills. If the data from the sampling and analytical

plan indicates the absence of PCBs, the ship and its components are not subject to the PCB provisions of TSCA.

Liquid Materials Manufactured with PCBs

Remove all liquid-filled electrical equipment suspected of containing PCBs or PCBcontaminated dielectric fluid, regardless of PCB concentration. Materials such as lubricating oils and greases used for winches and cargo-handling machinery, hydraulic fluids, heat transfer fluids, and waste oils should be removed from the vessel in accordance with the guidance in the "Oil and Fuel" section of this document.

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Photo courtesy of Laura Casey

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Engine room electrical cabling on the ex-USS Oriskany.

Manufactured Products Containing Solid PCBs

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Remove all manufactured products containing \geq 50 ppm of solid PCBs, which includes, but is not limited to, felt gasket and faying material, cables, paints, rubber gaskets, as well as battle lanterns and fluorescent light ballasts.

Thermally removing PCB-containing materials is generally not authorized without prior written approval. Because PCB sampling and analytical procedures can be expensive and time consuming, there may be situations when the cost of sampling and analysis far exceeds the cost for removal and disposal. In some cases, vessel-to-reef projects have shown that removal of all electrical cables and wires suspected of containing PCBs was the most economical course of action. While the complete removal of all manufactured products containing ≥ 50 ppm of solid PCBs is recommended, EPA recognizes that in some vessels it may not be feasible to identify and remove every such item. If such materials cannot be feasibly identified and/or removed, an application to EPA for a risk-based approval to dispose of the PCB bulk product waste in a marine environment for purposes of creating an artificial reef is required pursuant to 40 CFR 761.62(c). (EPA's decision includes consideration of a risk assessment submitted by the applicant, and a public participation process. Please consult the responsible EPA office for more information.)³

Materials Containing PCBs as a Result of Spills

Remove all materials containing \geq 50 ppm of PCBs due to PCB spills. In addition, depending on the concentration of the spilled PCBs and the date when the spill occurred, it may be necessary to remove materials currently containing less than 50 ppm of PCBs due to spills.⁴ If it is not known when a spill occurred, you should generally assume that it occurred after July 1, 1979.

During vessel clean-up/preparation, attention should be directed to locations on the ship that are known to house equipment and systems that typically contain PCB liquids. Because such equipment or systems are vulnerable to leaks and spills during the lifetime of the vessel, the areas surrounding the equipment or systems are likely contaminated by liquids containing PCBs.

If there is no information regarding whether a spill occurred and/or the PCB concentration of any spilled liquid, design and implement a representative sampling plan to verify that there are no PCBs present in the areas surrounding the liquid-filled equipment or systems. If the sampling results indicate presence of PCBs as a result of a spill of liquids containing PCBs, remove the spill residue and the materials contaminated by the spill (e.g., remove paint from a contaminated surface such as a metal deck, strip the contaminated area down to bare metal in accordance with 40 CFR 761.79(b)(i)(B)). If spill residues or materials contaminated by PCB spills cannot be feasibly removed, an application to EPA for a risk-based approval to dispose of the PCBs in a marine environment for purposes of creating an artificial reef is required pursuant to 40 CFR 761.61(c). (EPA's decision includes consideration of a risk assessment submitted by the applicant, and a public participation process. Please consult the responsible EPA office for more information (see footnote # 3).)

³ Any vessel owner and/or sponsor should carefully consider the amount of time, resources and financial commitments necessary to address the identification, removal, and disposal of non-liquid PCB-containing materials and materials contaminated by spills of liquids containing PCBs before finally deciding if a vessel is suitable for reefing, and well in advance of commencing clean-up. EPA strongly recommends vessel owners and/or sponsors to begin discussions as soon as possible with the PCB coordinator for the EPA Region in which the vessel is proposed to be sunk. A list of EPA's current PCB coordinators may be found at <u>www.epa.gov/pcb/coordin.html</u>.

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⁴ For PCB spills that occurred between April 18, 1978, and July 1, 1979, and where the original source was \geq 500 ppm PCBs, remove all materials containing any concentration of PCBs. For PCB spills that occurred after July 1, 1979, and where the original source was \geq 50 ppm PCBs, remove all materials containing any concentration of PCBs. Remove all materials currently containing \geq 50 ppm PCBs as a result of spills (of any concentration) that occurred prior to April 18, 1978. Consult the PCB regulations at 40 CFR 761.3, 761.50(b)(3) and 761.61.

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40 CFR Part 761

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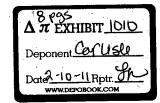
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Use Authorization for, and Distribution in Commerce of, Non-liquid Polychlorinated Biphenyls; Notice of Availability; Partial **Reopening of Comment Period; Proposed** Rule

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40 CFR Part 761

[OPPTS-66009F; FRL-6064-7]

RIN 2070-AD27

Use Authorization for, and Distribution in Commerce of, Non-liquid Polychlorinated Biphenyls; Notice of Availability; Partial Reopening of **Comment Period**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; notice of data availability; partial reopening of comment period.

SUMMARY: This action announces the availability of data that were submitted to EPA after the comment period closed for the December 6, 1994 proposal on the disposal of polychlorinated biphenyls (PCBs). This action also solicits additional information on the potential risks of exposure to PCBs, and the use and concentration of PCBs found in certain non-liquid PCB (NLPCB) applications. In the proposal of December 6, 1994, EPA solicited comment on a provision that would authorize the use of certain NLPCB applications (i.e., proposed § 761.30(q)).

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In addition to authorizing these uses, the proposed provision would have required compliance with several conditions (e.g., notification, marking, air monitoring and standard wipe tests, remediation, repair and/or removal, reporting and recordkeeping requirements). EPA is particularly interested in data regarding the PCB concentration and route(s) of exposure to PCBs found in the NLPCB applications that are the subject of this action and the associated risks of exposure. This action starts a 120-day data submission period which will be followed by an additional 90-day period for public comment on existing and new data submissions. Since EPA may rely on the data submissions that are generated as a result of this action to develop a final rule to authorize the use of these NLPCB applications, the Agency is providing the additional 90day comment period for parties who are interested in reviewing and commenting on any of the existing or newly submitted data.

DATES: Data submissions must be received by EPA on or before April 10, 2000. Comments must be received by EPA on or before July 7, 2000. **ADDRESSES:** Comments may be submitted by mail, electronically, or in person. Please follow the detailed

instructions for each method as provided in Unit III. of the "SUPPLEMENTARY INFORMATION" section. To ensure proper receipt by EPA, it is imperative that you identify docket control number OPPTS-66009F in the subject line on the first page of your response.

FOR FURTHER INFORMATION CONTACT: For general information contact: Christine Augustyniak, Associate Director. **Environmental Assistance Division** (Mail Code 7408), Office of Pollution Prevention and Toxics, Rm. E-543B. Environmental Protection Agency, 401 M St., SW., Washington, DC 20460; telephone: (202) 554-1404, TDD: (202) 554-0551, e-mail: TSCA-Hotline@epa.gov.

For technical information contact: Peggy Reynolds, Environmental Protection Agency, (Mail Code 7404), 401 M St., SW., Washington, DC 20460; telephone: (202) 260–3965, fax: (202) 260–1724, e-mail: reynolds.peggy@epa.gov.

SUPPLEMENTARY INFORMATION:

I. Does this Action Apply to Me?

You may be affected by this supplemental action if you own, use, process or distribute PCBs in commerce. Affected categories and entities include:

Category	Examples of Affected Entities
Industry	Electroindustry manufacturers, end-users of electricity and general contractors
Utilities and rural electric cooperatives	Electric power and light companies
Individuals, Federal, State, and Municipal Governments	Individuals and agencies which own, use, process and distribute PCBs in commerce

Respecting of Common Tarloot: Proceeds This table is not exhaustive, but lists the types of entities that could potentially be affected by this action. Other types of entities may also be interested in this action. To determine whether your entity is affected by this action, carefully examine the applicability criteria in Title 40 of the Code of Federal Regulations (CFR), part 761. If you have any questions regarding the applicability of this action to a particular entity, you should consult the applicable regulations, or the technical contact listed in "FOR FURTHER **INFORMATION CONTACT''** for the referenced final rule.

II. How Can I Get Additional Information, Copies of this Document, and Support Documents?

1. Electronically. You may obtain electronic copies of this document on the Internet from the EPA Home Page at http://www.epa.gov. An electronic copy of this document can be found under the "Federal Register-Environmental Documents" listing and the date of the publication of this document in the Federal Register (http://www.epa.gov/ fedrgstr/EPA-TOX/1999/).

2. In person. The official record for this action, including the public version, has been established under docket control number OPPTS-66009F. The official record also includes all material and submissions filed under docket control number OPPTS-66009C,

the record for the referenced final rule. The public version of the record, including printed, paper versions of any electronic comments, which does not include any information claimed as confidential business information (CBI), is available for inspection in the TSCA Nonconfidential Information Center, Northeast Mall Rm. NE-B607, 401 M St., SW., Washington, DC. The Center is open from noon to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number of the Center is (202) 260-7099.

III. How and to Whom Do I Submit **Comments?**

You may submit comments through the mail, in person, or electronically. To ensure proper receipt by EPA, it is

imperative that you identify docket control number OPPTS-66009F in the subject line on the first page of your response.

1. By mail. Submit your comments to: Document Control Office (7407), Office of Pollution Prevention and Toxics (OPPT), Environmental Protection Agency, 401 M St., SW., Washington, DC 20460.

2. In person or by courier. Deliver your comments to: OPPT Document Control Office (DCO) in the East Tower Rm. G-099, Waterside Mall, 401 M St., SW., Washington, DC. The DCO is open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the DCO is 202– 260–7093.

3. Electronically. You may submit your comments electronically by e-mail to: "oppt.ncic@epa.gov," or mail your computer disk to the address identified above. Do not submit any information electronically that you consider to be CBI. Electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Comments will also be accepted on standard computer disks in Wordperfect 6.1/8.0 or ASCII file format. All comments in electronic form must be identified by the docket control number OPPTS-66009F. Electronic comments may also be filed online at many Federal Depository Libraries.

IV. How Should I Handle CBI Information That I Want to Submit to the Agency?

Do not submit any information electronically that you consider to be CBI. You may claim information that you submit to EPA in response to this document as CBI by marking any part or all of that information as CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public version of the official record. Information not marked confidential will be included in the public version of the official record without prior notice. If you have any questions about CBI or the procedures for claiming CBI. please consult the technical person identified in the "FOR FURTHER INFORMATION CONTACT" section.

V. What Does this Action Do?

This action announces the availability of data that were submitted to EPA after the comment period closed for the

December 6, 1994 proposed rule (59 FR 62788) (FRL-4167-1). These data, as described below, are available for review and comment. This action also solicits additional information and comment on the potential risks of exposure to PCBs, and the use and concentration of PCBs found in the nonliquid PCB (NLPCB) applications that are the subject of this action. EPA proposed to amend its rules under the Toxic Substances Control Act (TSCA) to authorize the use of NLPCBs and their. distribution in commerce, and to impose related information collection requirements. These issues had also been discussed in the Advanced Notice of Proposed Rulemaking (ANPR) of June 10, 1991 (56 FR 26740).

In advocating the removal of the conditions that were included in the December 6, 1994 proposal (e.g., notification, marking, air monitoring and standard wipe tests, remediation, repair and/or removal, reporting and recordkeeping requirements), some commenters submitted supplemental data that they claim showed that these NLPCB uses "do not pose a risk above acceptable measures." However, EPA did not include this use authorization in the final rule which was published on June 29, 1998 (63 FR 35384) (FRL-5726-1) because insufficient data were available to enable the Agency to make the no unreasonable risk finding for many of the NLPCB uses. These data submissions, as well as an assessment of those data are available for inspection. (see the listing of reference documents at Unit VIII. of this action) in the TSCA Public Docket Office. In the absence of data which could be used to determine whether a correlation exists between PCB bulk sample results and PCB surface contamination, several conservative assumptions were used in the draft risk document (see Ref. 23 "Revised Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations"). The Agency solicits public comment on these materials, and in particular, would appreciate comments, which are supported by data, regarding the draft risk analysis.

VI. What Non-liquid PCB Uses Are of Interest to EPA?

In the ANPR (June 10, 1991), EPA solicited information on unauthorized uses of NLPCBs in existing applications, and in the NPRM of December 6, 1994 (59 FR 62788), EPA solicited comments regarding a provision which would authorize the use of these NLPCBs. Items not authorized by the regulations but currently in use and identified as containing PCBs include, but are not limited to, some wool felt insulating

materials, plastics, paint formulations, small rubber parts, adhesive tape, insulating materials used in electrical cabling, fluorescent light ballast potting materials, gaskets in heating, ventilation and air conditioning and other duct systems, caulking, coatings for ceiling tiles, flooring and floor wax/sealants, roofing and siding materials, adhesives, waterproofing compounds, anti-fouling compounds, fire retardant coatings, coal-tar enamel coatings for steel water pipe and underground storage tanks (i.e., American Water Works Association (AWWA) Standard C203 coal tar enamel), and any number of other chemical uses such as additives and plasticizers. The PCB contamination in these various products was reported to range from <1 to 688,498 parts per million (ppm). EPA is interested in data for those NLPCBs that do not satisfy the criteria for excluded PCB products, recycled PCBs, or inadvertently generated PCBs (i.e., generally historic uses of PCBs at concentrations of <50 ppm PCB) which are authorized by the current regulations. (For a detailed discussion, see 40 CFR 761.3 for the definitions of "excluded PCB products" and "recycled PCBs." Also see the definition for "excluded manufacturing processes" at 40 CFR 761.3, the regulatory requirements for excluded manufacturing processes at 40 CFR 761.185 and 761.187, and the requirements for inadvertently generated PCBs at 40 CFR 761.193.)

A brief description of the non-liquid PCB uses which have been reported to **EPA** follows. Limited information regarding many of these products is contained in the NPRM (see 59 FR 62809-62811, December 6, 1994), as well as the comments and data that were submitted to EPA in response to the ANPR and NPRM (OPPTS-66009/ 66009A) and are summarized below. The following descriptions also reflect information gained by EPA over the course of implementing the PCB program. Additional non-liquid PCB products, when discovered, may also be covered by this use authorization. Therefore, information concerning unauthorized NLPCB uses which have not been identified above are also of interest and may be submitted to the Agency

• Insulation (e.g., wool felt, foam rubber and fiberglass) and sounddampening materials. These materials have been found to contain PCBs at concentrations which exceed 50 ppm. Wool felt and foam rubber insulation, as well as sound-dampening materials have been discovered in naval vessels and may include ships of all types, as well as nuclear submarine reactor

compartments. PCB concentrations were reported to range from <1 ppm to a high of 688,498 ppm (Ref. 15). Fiberglass insulation containing PCBs has been found in federally owned buildings at various concentrations. Bulk PCB concentrations were reported to range between <1 to 39,158 ppm, and surface contamination was reported to range between 7.5 to 188 micrograms per 100 square centimeters. All air samples were reported by the submitter as being below the analytical detection limit which was generally reported as 0.97 micrograms per cubic meter (Ref. 3). The use of PCB-contaminated fiberglass insulation may be widespread throughout the United States.

 Plastics, small foam rubber and rubber parts, adhesive tape, and insulating materials used in electrical cabling. PCBs may be in many of the components of electric cable at concentrations ranging from <1 ppm PCBs to 280,000 ppm PCBs (Refs. 15 and 16). In addition to electrical applications, these components may be in widespread use in marine and industrial applications. It is not clear whether PCB-containing cables would be found in residential settings. • Paint formulations. During the 1950–1960 time frame, PCBs were added to paint formulations as drying oils (resins) and plasticizers or softening agents (liquids) in concentrations that range from 10-12% PCBs (100,000-120,000 ppm) to 20-30% PCBs (200,000-300,000 ppm). Concrete surfaces and equipment, as well as marine or waterproofing applications, used at Federal installations and in the manufacturing and industrial sectors may have painted surfaces contaminated with PCBs. Data provided to EPA indicate that PCBs have been found in dried paint at concentrations that range from <1 ppm to 97,000 ppm (Refs. 9 and 13).

• Fluorescent light ballast potting materials. Older fluorescent lamps (i.e., manufactured prior to 1978) may contain a small PCB Capacitor with 100% PCBs (i.e., 1,000,000 ppm) and/or petroleum-asphalt insulating material contaminated with PCBs (Ref. 6).

 Gaskets in heating, ventilation and air conditioning (HVAC) and other duct systems. It is not known whether this particular PCB application represents a widespread use. PCBs were discovered in older government buildings at concentrations of 18,900 ppm (Ref. 16); however, given the generic nature of the specifications for this material, these gaskets also may have been installed in commercial and industrial buildings. Additionally, ventilation system gasket materials made from processed cork that have been contaminated with PCBs at concentrations up to 6,400 ppm PCB have been found on naval vessels (Ref. 15)

• Coatings for ceiling tiles. Ceiling tiles contaminated with PCBs have been found at educational institutions with surface level PCB concentrations at a maximum of 53 ppm. However, the availability and dissemination in the marketplace of this material is not known.

• Flooring and floor wax/sealants. A commenter indicated that these materials have been found to contain PCBs; however, little else is known about specific PCB concentrations, application(s) or its availability and dissemination in the marketplace (Ref. 2).

• Roofing and siding materials. This material was manufactured and marketed worldwide as Robertson Protected Metal (RPM) and Galbestos to airlines, railroads, chemical plants, steel mills, mines, industrial/manufacturing facilities, and military facilities. PCB concentrations have been found to range from <2 ppm to 30,000 ppm (59 FR 62809).

• Caulking and grout. Very little is known about contaminated caulking and grout, their specific applications and dissemination in the marketplace. Samples of caulking that have been contaminated with PCBs have been found in a setting previously used as a school at a maximum concentration of 310,000 ppm PCBs (Ref. 12). Likewise, grout has been found in the joints and cracks of a water reservoir at 2,700 ppm PCB and on marine vessels at concentrations which range from <1 to 9,100 ppm PCB (Ref. 15) in the mess room and other onboard locations,

• Waterproofing compounds, antifouling compounds, and fire retardant coatings. These non-liquid uses of PCBs have been found in military, marine and other applications; PCB concentrations have been found as high as 59,000 ppm PCB.

• Coal-tar enamel coatings for steel water pipe and underground storage tanks (i.e., AWWA C203 coal tar enamel). This coating was previously approved for use by EPA pursuant to the Safe Drinking Water Act and has been used in some older Army, municipal and other water supply systems. The PCB concentration in this enamel may range from non-detect to 1,264 ppm (Refs. 11 and 26). EPA withdrew and thereby invalidated its list of acceptable drinking water products on April 7, 1990, and since that time, individual States have had the authority to regulate the sale and/or use of specific products. The Agency has never used its authority under TSCA to control the use of this indirect additive to a drinking water system.

VII. What Data Are Currently Available to EPA?

The following table provides information on the maximum PCB concentrations found in sample data that have been submitted to EPA. A review of this table, along with the criteria discussions that follow, will give you some indication of the NLPCBs that EPA could possibly authorize under the TSCA PCB regulations and the data that would be useful in order to evaluate the risks of exposure to PCBs associated with specific NLPCB uses. Unit VI. of this action provides additional guidance on the type of data that EPA needs to finalize a NLPCB use authorization.

Table 1.---Maximum PCB Concentrations From Sample Data

Material	Bulk Sample (mg/kg or ppm)	Standard Wipe Sample (µg/100 cm²)	Air Sample (µg/cm³)
Adhesive tape	1,400	No data available	No data available
Anti-fouling compounds	No data available	No data available	No data available
Caulking	310,000	No data available	No data available
Ceiling tiles	53	1.3	No data available

Material	Bulk Sample (mg/kg or ppm)	Standard Wipe Sample (μg/100 cm ²)	Air Sample (µg/cm ³)
Cloth/paper insulating material	12,000	No data available	No data available
Coal-tar enamel coatings	1,264	No data available	No data available
Dried paint	63,300 ¹ 97,000 ²	2,560 ¹ 40 ²	No data available No data available
Fiberglass insulation ³	39,158	188 · · · · · · · · · · · · · · · · · ·	<0.97
Fire retardant coatings	No data available	No data available	No data available
Flooring and floor wax/sealant	No data available	No data available	No data available
Fluorescent light ballast potting material	No data available	No data available	No data available
Foam rubber insulation	13,100	No data available	No data available
Foam rubber parts	1,092	No data available	No data available
Grout	9,100	No data available	No data available
insulating materials in electric cable	280,000	No data available	No data available
Plastics/plasticizers	13,000	304	No data available
Processed cork ventilation system gasket material	6,400	No data available	No data available
Roofing/siding material	22,000	No data available	No data available
Rubber parts	84,000	No data available	No data available
Sound-dampening material	No data available	No data available	No data available
hermal insulation	73,000	No data available	No data available
Vaterproofing compounds	No data available	No data available	No data available
Vool felt gaskets	688,498	No data available	No data available

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 Non-degraded gray chlorinated rubber-based paint, Federal specification TT-P-912; PCBs added presumably to prevent brittleness.
 Semi-gloss paint; white and light blue, Amercoat 33HB with red Amercoat 86 primer.
 Athough sampling results for this material are available from the docket, these data were not available at the time the draft risk analysis was completed

Surface PCB concentration taken from wipe samples of plastic cable.

EPA's criteria for authorizing a NLPCB use. EPA will apply certain criteria to test data results when determining whether a material that is suspected of containing PCBs should be authorized for use. For instance, EPA has received some data that would not satisfy the criteria stated below. These data showed positive wipe sample results from contamination of the surface by PCBs. However, the bulk sample did not contain PCBs. This type of information is not useful for authorizing a NLPCB application. EPA believes these results indicate contamination due to a PCB spill rather

than contamination associated with the manufacture of a product containing PCBs. EPA will not authorize the use of spilled PCBs. If you own items that have been contaminated as a result of a spill, you should either decontaminate or dispose of the item(s). The objective of the use authorization is to allow the continued use of those PCB-containing materials that do not pose an unreasonable risk. The use of these materials is currently unauthorized. Since some items currently being considered for the NLPCB use authorization may be contaminated with PCBs due to their proximity to PCB

liquids, as opposed to being a PCB. containing item, EPA intends to use the following criteria for determining whether materials suspected of containing PCBs should actually be considered for the NLPCB use authorization.

• If the bulk sample contains PCBs, but the wipe sample does not contain detectable levels of PCBs, then the PCBs have not significantly migrated from the material onto the surface. If there are no PCBs present on the surface, then it is assumed that no significant releases of PCBs to air are occurring. Therefore, air sampling would not be necessary. In

this situation, there would most likely be a low risk of exposure to PCBs, since PCBs are being released from the material at a low or non-existent rate. EPA could most likely authorize this use without some or all of the conditions listed in the proposal (see 59 FR 62857).

• If the bulk sample contains PCBs that are migrating out onto the surface, then the wipe sample will be expected to contain PCBs. Likewise, if the PCBs are being released from the surface into the air, then the air sample will be expected to contain PCBs. Note that the air sample will most likely contain PCBs at more dilute concentrations than those in the surface levels. EPA may or may not authorize this use, depending on the risk of exposure to PCBs.

• If neither the bulk nor the wipe sample contains PCBs, but the air sample does contain PCBs, then the PCBs are most likely from a source other than the material being tested. EPA cannot use these data to support a use authorization.

• If there are no PCBs in the bulk sample, but the wipe sample contains PCBs, then the PCBs are most likely from a spill rather than from the material being tested. EPA cannot use these data to support a use authorization.

The following chart provides a summary of the criteria that EPA will use to authorize the use of certain nonliquid PCBs.

Bulk Sample	Wipe Sample	Air Sample	Possible Result
Contains PCBs	No PCBs	No PCBs or data are not avail- able	PCBs not being released; pos- sible authorization for use
Contains PCBs	Contains PCBs	Contains PCBs	PCBs are being released from the material; use authorization depends on risk levels
No PCBs · · · · · · · · · · · · · · · · · · ·	No PCBs	Contains PCBs	PCB contamination from another source
No PCBs	Contains PCBs	May or may not contain PCBs	PCBs due to a spill

In addition to the risk of developing cancer, PCBs also have significant noncarcinogenic effects, including neurotoxicity, reproductive and developmental toxicity, immune system suppression, liver damage, skin irritation, and endocrine disruption. These toxic effects should also be considered when assessing risk (Ref. 27). Therefore, in addition to evaluating the cancer risks associated with these NLPCB uses, the Agency intends to consider the potential non-cancer effects. It should be noted, however, that the Agency is currently conducting a reassessment of the non-carcinogenic effects of PCBs in order to determine whether the reference dose (RfD) factors for PCBs currently in the Agency's Integrated Risk Information System (IRIS) can be updated. It is possible, therefore, that the current RfDs may not be retained. Therefore, detection limits that are estimated using the current RfDs may not be low enough after the Agency's re-evaluation is complete. Thus, achieving the lowest possible detection limits is the recommended course of action in order to avoid reanalyzing samples if these RfDs are lowered.

VIII. What Data Does EPA Need?

EPA received some very useful data, but much of these data do not address the Agency's objective of assessing the risk of exposure due to the use of PCBs in a particular product. For example, wipe samples from the wall of a ship's

engine room or air samples from living quarters cannot be used to evaluate the risk from air handling system gaskets when other potential sources of PCBs may be present on the ship or when no gaskets containing PCBs are present in the ship's handling system. It would be useful to have both surface results and bulk sampling results so that possible relationships between bulk and surface concentrations could be better defined. EPA also needs a better understanding of the individual sampling results including summary statistics such as range, median mean, standard deviation, and geometric mean in order to better determine if the results are representative of the sample population. Likewise, it is necessary to know the population characteristics with respect to PCB concentration, number of data points collected within a population, and how those data points represent the overall population of the items in use.

EPA would like to use the data to assess exposure via dermal contact and inhalation for most materials, as well as via incidental ingestion, as appropriate (e.g., paint chips). Surface samples are preferable for estimating dermal exposures because they reflect the PCB concentrations that individuals actually contact. EPA has data on a limited number of uses for which there are both bulk PCB concentrations and surface. concentrations for the same material. Therefore, information on both bulk sample concentrations and wipe sample. concentrations would be useful for 4 5.

defining the relationship between bulk and surface samples for use in dermal exposure assessments. Bulk sample data are also needed to assess incidental ingestion for some materials. EPA has no data on the volatilization or entrainment of PCBs from individual uses. This information would greatly facilitate the estimation of inhalation risk. Preliminary estimates were based on theoretical calculations, often employing very conservative approaches (Refs. 23 and 24). Also, the data EPA is currently using to assess dermal and inhalation risk for most uses is relatively old. Newer data would be

useful in providing updated estimates. As suggested earlier, EPA is interested in being able to detect cancer risks at or below 1 x 10⁻⁶ and non-carcinogenic hazards at or below a hazard index of 1. Because traditional sampling techniques may not have sufficiently low practical limits of quantitation (PQL) for EPA to determine that these NLPCB uses do not pose unreasonable risks, the approach to sampling may require much larger surface areas, much larger air volumes, or much more sensitive chemical analysis procedures than previously used. Consideration should also be given to achieving the lowest possible detection limits because of potential changes to the current RfDs.

Prior to finalizing a rule that would authorize the conditional use of these materials, the Agency is soliciting public review of and comment on the data that were submitted subsequent to

the official comment period for the December 6, 1994 NPRM. Data supporting a non-conditional use authorization for NLPCBs (i.e., a provision which would eliminate or minimize notification, marking, air monitoring and standard wipe test. 83 remediation, repair and/or removal, reporting and recordkeeping requirements) may be submitted for the use of PCBs in any of the various applications identified above. A listing of the data elements that are required for this analysis is provided below. Please note that due to the uncertainty associated with updating the reference dose (RfD) for PCBs, the following discussions focus solely on the risk of developing cancer. In the absence of an updated RfD, the Agency is inclined to continue to use conservative risk assumptions for issues associated with the use of PCBs.

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1. Wipe sample data for each of the products (or classes of products, i.e., paint) for which use would be authorized. Data should be collected from products that are known to contain PCBs (i.e., based on bulk sample results or from historic knowledge). Also, the detection limits for these materials should be sufficiently low to ensure that the cancer risks and non-carcinogenic hazards can be calculated down to less than 1 x 10⁶ and below 1, respectively (note that the current RfDs for PCBs are likely to change), in order for the NLPCB use to be authorized. EPA recommends using the lowest achievable detection limit possible.

2. Transfer data. Information on the transfer of PCBs to human skin from the non-liquid PCBs listed in Table 1 of Unit V.

3. Air monitoring data for each of the products (or classes of products, i.e., paint) for which use would be authorized. Data should be collected from products that are known to contain PCBs (i.e., based on bulk sample results or from historic knowledge). Also, the detection limits for these materials should be sufficiently low to ensure that the cancer risks and non-carcinogenic hazards can be calculated down to less than 1 x 10⁻⁶ and below 1, respectively. EPA recommends using the lowest achievable detection limit possible.

Each product (or class of products, i.e., paint) sampled must contain high enough concentrations of PCBs in their bulk sample to be representative of the highest concentrations of PCBs in the product (or class of products, i.e., paint). For example, commenters provided information that paint formulations with 10-12% PCBs were recommended in the commercial formulation manuals. Therefore, EPA is especially interested in wipe sample and air monitoring data for products such as paints with bulk sample levels of 10-12% PCBs. In addition to the collected data, EPA requests the sampling plan that was used in collecting the data and a description of the quality assurance/ quality control procedures that were applied to the data set.

In order to facilitate EPA's review of the data (i.e., bulk, standard wipe, and air sample results) on NLPCB containing materials, you should consider the following in order to judge the adequacy of your data submissions:

• Are the bulk and wipe samples of specific materials (i.e., uses) rather than of areas (e.g., engine room, mess deck/ galley, berthing, pilot house, etc.)?

• Do you have corresponding samples (i.e., both bulk and wipe samples) for the specific materials?

• Did you collect air samples using procedures for chamber testing in order, to differentiate PCBs that offgas from specific materials rather than from PCBs that are in ambient air?

EPA recommends using the lowest achievable detection limit possible so that cancer risks of 1×10^{-6} or noncancer hazards of 1 may be detected. The detection limits at these risk levels may be estimated using cancer slope factors or reference doses for PCBs developed by EPA. The lower of the detection limits based on either cancer or non-cancer endpoints should be used to ensure that both types of effects could be detected.

If commenters and/or data submitters would like to submit comments or data anonymously, EPA will accept submissions comments and data submissions (e.g., via a third party): However, it is important that EPA be able to contact someone should questions arise concerning the collection methodology, analytical procedures or other technical issues, even if through a third party.

IX. List of Reference Documents

The following documents are available in the combined docket for OPPTS-66009 (OPPTS-66009A, OPPTS-66009B and OPPTS-66009C). Documents identified with an asterisk were submitted to EPA after the official comment period for the proposed rule had closed. Since these data will be used in the Agency's decision making process, this listing is intended to ensure ample opportunity for public review and comment on pertinent documents.

1. Aluminum Company of America. Comments from Connie Glover Ritzert to the TSCA Nonconfidential Information Center, USEPA. Subject: Comments on Proposed Amendments to the TSCA PCB Regulations (59 FR 62788) - OPPS[sic]-66009A; FRL-4167-1 (May 3, 1995) (see C1-239, Table 3).

2. Consumers Power. Comments from William L. Beckman to the TSCA Nonconfidential Information Center, USEPA. Subject: Document Control Number OPPTS-66009A; FRL-4167-1, U.S. Environmental Protection Agency, December 6, 1994, Proposed Amendment to 40 CFR Part 761, Disposal of Polychlorinated Biphenyls (PCBs) (May 4, 1995) (see C1-179).

3. General Services Administration. Letter from David Spannbauer to Barry Breen, Federal Facilities Enforcement, USEPA, Subject: PCBs in Fiberglass Insulation in Federally Owned Buildings (1994) With Enclosures (see B3-032).*

4. General Services Administration. Letter from Casey Jones to Robert Harding, Section Chief, Toxic Substance Branch, USEPA, Subject: PCB Contamination at the Wallace F. Bennett Federal Building (date not discernible) With Enclosure (see B3-033).*

5. General Services Administration. Letter from Casey Jones to Kim Le, USEPA, Subject: Update on PCB Contaminated Insulation at the Wallace F. Bennett Federal Building (February 2, 1994) With Enclosure (see B3-034).*

6. Kominsky, John, NIOSH et al. "Polychlorinated Biphenyl Contamination Resulting from Fluorescent Light Ballast Burnout (Draft)." (April 14, 1986) (see C3-010).

7. Larcom, B.J.; Cline, J.M.; Merrill, E.A.; Jederberg, W.W.; Still, W.R. "Risk Assessment of Polychlorinated Biphenyls On-board Navy Ships." A report prepared for the U.S. Navy. AL/ OE-TR-1996-0153. WRAIR-TR-NMRI-96-72 (1996) (see C3-001).*

8. Parsons Engineering Science, Inc. "Risk Review Paper, Evaluation of Existing Data for PCBs in Non-liquid Material (NLPCBs)." A report prepared for Environmental Management Directorate, Robins Air Force Base, GA and Air Force Material Command Under USAF Contract No. F41624-94-D-8136, Delivery Order No. 0069 (1997) (see C3-002).*

9. Ropes Gray. Letter from Mark A. Greenwood to Mr. John H. Smith, USEPA. Subject: Response to Data Request on PCBs in Paint (July 21, 1998) (see C3-017).*

10. Ross, M.; Mangum, S.; Adema, C. "Sampling and Analysis of Polychlorinated Biphenyls (PCBs) in Navy Ship Cables." A report prepared by the Naval Sea Systems Command, Code 05V, Report No. 9510, Ser. 6110/ 121 (1993) (see C1-107, Enclosure 11). 11. U.S. Army. Comments from Lewis D. Walker to Joseph S. Carra, USEPA. Subject: Comments on Proposed Polychlorinated Biphenyl Rule (May 2, 1995) (see C1-260).

12. U.S. Army Corps of Engineers, New England Division. "Final Site Investigation Report for Campbell, Lyle, Stone and Otis Memorial Schools. Bourne, MA." A report prepared by Stone and Webster Environmental Technology and Services under Delivery Order 17, Contract No. DACW33-94-D-007 (1996) (see B3-001).*

13. U.S. Department of Energy. Letter from Thomas T. Traceski to Mr. John Melone, USEPA. Subject: Results of Testing at the Savannah River Site (October 29, 1988) (see C3-018).*

14. U.S. Department of Energy Schenactady Naval Reactors Office. Letter from A.R. Seepo to Kim Tisa, **USEPA Region 1. Subject: Documentation of Research Regarding** Historical Uses of PCBs in Paint (April 19, 1995) (see C3-004).

15, U.S. Department of the Navy. **Electronic submission; CD-ROM** containing spreadsheets of PCB sample results, Excel for Office 97. Samples taken from various naval vessels; Files: PCBEPA01.XLS (see Sheet 1) and PCBEPA02.XLS (see Sheet 1) (see C3-019).*

16. U.S. Department of Transportation, Maritime Administration. Appendices from Report No. MA-ENV-820-96003; Appendix D, Sampling and Analysis (January 1997) and Appendix E, Survey of Ships and Materials (July 1997) (see B3-030).*

17. U.S. Department of Transportation, U.S. Coast Guard. Memorandum from Alan M. Steinman,

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Chief, Office of Health and Safety to Chief, Office of Engineering, Logistics and Development. Subject: Health Risk Evaluation of 65' WYTL and 82' WPB Class Cutters (January 18, 1996) With Enclosure: "PCB Health Risk Evaluation of 65' WYTL and 82' WPB Class Cutters, Office of Health and Safety, Safety and Environmental Health Division, January 1996." (see B3-031).*

18. Versar Inc. Memo from Linda Phillips to Tony Baney, USEPA. Subject: Review of PCB Data for DOE Savannah River Site (November 13, 1998) (see B3-038).*

19. Versar Inc. Memo from Linda Phillips to Tony Baney, USEPA. Subject: Review of Ropes Gray Sampling Data (October 12, 1998) (see B3-037). 20. Versar Inc. Memo from Linda Phillips to Peggy Reynolds, USEPA. Subject: Data Submissions for Risk Analysis for Authorized Uses of PCBs (December 8, 1998) (see B3-039).*

21. Versar Inc. Memo from Linda Phillips to John Smith, USEPA. Subject: **Review of Air Force Risk Assessment** (November 10, 1997) (see B3+035).*

22. Versar Inc. Memo from Linda Phillips to John Smith, USEPA. Subject: Review of U.S. Coast Guard PCB Risk Assessment (March 13, 1998) (see B3-036).*

23. Versar, Inc. "Revised Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations," A report prepared for the U.S. **Environmental Protection Agency under** Contract No. 68-W6-0023, Work Assignment No. III-3 (March 12, 1999)

(see B3-040).* 24. Versar, Inc. "Revised Preliminary Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations." A report prepared for

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the U.S. Environmental Protection Agency under Contract No. 68-W6-0023, Work Assignment No. II-9 (October 14, 1997) (see E3-021).*

25. Westinghouse Savannah River Company. Letter from Nancy Lowry to David K. Hannemann, USEPA. Subject: **Detailed Information on PCB Analyses** of Painted Surfaces (May 28, 1997) (see C3-005).*

26, U.S. Army Corps of Engineers. Comments from Daniel R. Burns to the **TSCA Nonconfidential Information** Center, USEPA. Subject: Comments on the Proposed Rule on the Disposal of Polychlorinated Biphenyls (April 20, 1995) (see C1-139),

27. U.S. Environmental Protection Agency. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures, EPA/600/P-96/ 001 (September 1996) (See B3-026).*

28. Midwest Research Institute. "Polychlorinated Biphenyl Analysis of Cable Samples from U.S. Navy Ships." A report prepared for the U.S. **Environmental Protection Agency under** Contract No. 68-DO-0137, Work Assignment No. 30 (August 14, 1992) (See B3-043)*.

List of Subjects in 40 CFR Part 761

Environmental protection, Hazardous substances, Polychlorinated biphenyls, Reporting and recordkeeping requirements.

Dated: November 29, 1999.

Susan H. Wayland,

Deputy Assistant Administrator for Prevention, Pesticides and Toxic Substances. [FR Doc. 99–32079 Filed 12–9–99; 8:45 am]

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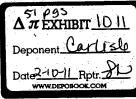
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At the request of the San Diego Regional Water Quality Control Board (SDRWQCB) through Region IX, EPA, the National Field Investigations Center-Denver conducted investigations of San Diego, California shipyards from March 18 to April 5, 1974. The objective of the investigations was an evaluation of shipyard facilities and waste control practices and the influence of these practices on San Diego Bay water quality factors, for the purpose of developing a model NPDES permit for San Diego commercial shipyards.

Studies conducted by SDRWQCB (Barry, 1972) and others have documented contamination of San Diego Bay sediments by high concentrations of heavy metals (arsenic, copper, mercury, nickel, and zinc) especially in areas of shipbuilding and ship repair activity. It was reported that the primary source of these toxic pollutants was primers and anti-fouling paints removed (by blasting or other methods) from ship hulls at repair facilities. In the SDRWQCB report, the uptake, accumulation, and toxicity of copper, lead, zinc, arsenic, mercury, nickel and chromium by marine organisms were detailed.

Most wastewaters in the San Diego Bay area are presently collected by intercepter sewers, treated, and discharged into the open Pacific Ocean, rather than into the Bay. Formerly, much wastewater was discharged directly to the Bay. For these reasons, at least one shipyard official has expressed the opinion that high concentrations of metals in San Diego Bay sediments could have been deposited in times past, either from presently abandoned sewer outfalls or from discontinued shipyard operations.

To evaluate the influence of pollutants from shipyards on San Diego Bay, samples of solid materials (spent abrasives, hull scrapings, etc.) and wastewater discharges were collected from shipyards, and sediment cores and marine biota were collected from the Bay in the immediate vicinities of shipyards. Spent abrasives (including old primer and antifouling paint) from these shipyards contained consistently high concentrations of copper, zinc, lead, and chromium, and high, but somewhat variable, concentrations of cadmium, tin, mercury, and arsenic (Table 1). Similarly, sediment cores taken along transects directly out into the Bay from these shipyards also contained high metals concentrations (Table 2). Analysis of sediment core data reveals that the highest heavy metals concentrations generally occurred at the surface of the core (rather than deeper in the bottom of the Bay), and at locations on the transects nearest the shipyards. Metals concentrations diminished with distance from shore and with depth in the Bay bottom. Microscopic examination of these sediments revealed a similar pattern: freshly blasted abrasive and paint chips were most evident in surficial sediments nearest the shipyards. Sediments from locations farther out into the Bay contained progressively lower densities of abrasives, and these abrasives were more weathered. There were no definite trends in the distribution of specific metals, reflecting the diversity of composition of antifouling paints used on ship hulls.

Water samples were collected from some of the limited number of wastewater outfalls located at San Diego Bay shipyards. Concentrations of heavy metals were extremely high in these samples (Table 3), reflecting the fact that the water had contacted materials cleaned from ship and boat hulls before being discharged. A leaching test of limited extent and duration (spent abrasive from 5 shipyards exposed to relatively uncontaminated seawater for 12 days) demonstrated that heavy metals, especially copper and zinc, may readily dissolve from materials removed from ship hulls (Table 4).

Marine biota were collected from San Diego Bay in the immediate vicinities of shipyards. The flesh of grazing molluscs (<u>Crepidula</u>) from these areas contained high metals concentrations, and the flesh of filter-feeding sea squirts generally contained lesser concentrations (Table 5).

It is concluded that San Diego Bay is being polluted by heavy metals from shipyards, and that the most significant source of these pollutants is materials (antifouling paints and primers) removed from ship hulls. It was the intent of Congress in establishing the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) that the discharge of pollutants from all sources including shipyards be abated and, where technologically and economically feasible, eliminated. The following sections of this report detail methods by which abatement of pollutant discharges from shipyards may be accomplished, and present a model permit for application to San Diego ship repair and shipbuilding facilities.

Reference

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Barry, Joseph N. 1972.

Staff report on wastes associated with shipbuilding and repair facilities in San Diego Bay. California Regional Water Quality Control Board, San Diego Region. 46 pp.

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METALS CONCENTRATIONS IN EFFLUENTS AND RECEIVING WATERS SAN DIEGO BAY SHIPYARDS

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RATIONALE FOR WATER POLLUTION CONTROL AT SAN DIEGO SHIPBUILDING AND SHIP REPAIR FACILITIES.

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INTRODUCTION

The Federal Water Pollution Control Act Amendments of 1972 (5) require that the discharge of all pollutants be controlled insofar as is technically and economically feasible. In addition, the Act requires that all point sources discharging to the waters of the U.S., including the territorial seas, apply for a NPDES (National Pollutant Discharge Elimination System) permit. One such class of point sources includes the shipbuilding and repair industry.

A search of published information, representing such varied locations as Pearl Harbor, Hawaii, San Diego and Newport Bay, California, Baltimore Harbor, Maryland and the James and Elizabeth Rivers in Virginia, indicated high concentrations of pollutants, primarily heavy metals in sediments in the vicinity of shipyards (2, 10, 17, 19, 20, 21 and 23). This relationship was subsequently verified and additional information gained by the EPA, NFIC-D field surveys in San Diego, California and Newport News, Virginia. The NFIC-D studies also included inspections of 25 shipyards on the East and West Coasts and Hawaii. The emphasis in this work was to characterize existing wastewater discharges, assess presence of pollutants in sediments of receiving waters, observe current pollution abatement programs, and evaluate pollution control needs.

The characteristics of sanitary wastes, cooling water and boiler blowdown are well documented in the literature and a detailed description is not within the scope of this rationale. However, from the NFIC-D field surveys and other available references, the characteristics of liquid discharges from ship repair operations may be described. Basically, discharges from graving docks during blasting and painting operations contain metals in both the particulate and soluble form. In addition, some blast grit is carried by water within the dock resulting in the discharge of suspended and settleable solids. While floating drydocks and marine railways may not have the confined liquid discharges as do graving docks, the pollutants reaching the receiving water are the same in character.

Control and treatment technology measures are presented in terms of types of wastes generated and production process or type of structure used for repair of building (i.e., graving docks, floating drydocks, marine railways, shipways and vertical hoists). As may be noted in the discussion which follows, the control measures rely heavily on the <u>segregation</u> of wastewaters and general <u>housekeeping</u>. It is the firm belief of NFIC-D that this is a defensible and responsible approach.

As control and treatment measures are presented, it may be noted that numerical effluent limitations have previously been established for the discharge of all sanitary wastes and the discharge of cooling water and boiler blowdown from onshore facilities. Shipbuilding and repair wastes on the other hand are to be controlled by good housekeeping practices which will essentially eliminate the discharge of pollutants. This, coupled with the fact that discharges from floating drydocks marine railways, some shipways and vertical hoists, are not discharged in a manner such that representative sampling can be accomplished, has resulted in the recommendation of an alternative approach to numerical effluent limitations. Therefore, each shipyard will be required to submit a WATER POLLUTION CONTROL PLAN detailing the control measures to be applied in the operation of shipbuilding and repair facilities including graving docks, floating drydocks, marine railways, shipways and vertical hoists. The plan must address each of the waste source categories listed below if they exist at the facility, detailing specific methods by which to what pollution from these sources will be controlled. Also to be included in the plan is a schedule setting forth the earliest time by which the control measures can be implemented and the times for any intermediate steps leading to complete implementation. The objective in handling each of the waste sources is stated in the following section along with a method of meeting the objective. It is recognized that other control mehtods may exist. These alternative methods will be acceptable provided the objecwhat are objectives? tives are accomplished, he active contributed to be defended as

CONTROL AND TREATMENT TECHNOLOGY

On-Shore Waste Sources

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Sanitary Wastes

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后来的"人"资料""不可任的"的最近是认识的""的"之"之外"的"最近之中的经济 nas interes ada as areas In compliance with the Federal Water Pollution Control Act Amendments of 1972, information defining secondary treatment was published in the Federal Register, August 17, 1973 (4). The requirements for secondary treatment set forth August 17, 1973, must be met no later than July 1, 1977 (5). These requirements will be applied to sanitary wastes from shipyards whether these emanate from shore facilities or ships being repaired. Prepreatment standards were published in the Federal Register on November 8, 1979 regulating discharges to municipal systems. cooling Water and Boiler Blowdown Suhat source? - not coverd

Effluent guidance for cooling water discharges and boiler blowdown has been suggested by E.P.A. (22). The guidance rationale centers upon in-plant measures to control the discharge of corrosion inhibiting substances. Suggested interim effluent limitations are based on using only enough additive to adequately protect the system against corrosion and by developing tighter process techniques within the individual cooling systems or by changing to a different base corrosion inhibitor.

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Suggested final effluent limitations are at levels which will not adequately protect cooling systems against corrosion. Therefore, three alternatives exist for meeting final limitations. First, the discharge may be treated. Second, new inhibitors without pollutional significance may be developed. Third, the discharge may be eliminated (22).

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Miscellaneous Industrial Wastes

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Miscellaneous industrial activities, for example metal plating operations, for which effluent limitations have been established may exist at individual shipyards. In these cases, limitations for the particular standard industrial classification apply. Where effluent guidelines are not yet established for the particular industrial classification, limitations will be applied as soon as they are proposed. Wastes from Shipbuilding and Repair Facilities

Wastes from Shipbuilding and Repair facilities pair solid the shire of a second of the second states of the second states and second solid solid solid second soli

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Shipbuilding and repair facilities refer to those facilities within a shipyard at which ships are docked for repair or new ships are constructed. Common names of these facilities are; graving docks, floating drydocks, marine railways, and shipways. In addition, other repair facilities may be used including boat hoists of various types. Carving Docks and a shipways are as a shipways of various types.

A graving dock is a basin into which a ship may be floated. Usually constructed of concrete, the basin is isolated from the adjacent waterway with a gate. Permanently installed pumps dewater the dock and the ship comes to rest on previously positioned keel blocks. Drainage channels in the floor slope to a common point and convey water to the dewatering pumps. After dewatering is completed and during ship repair or new construction, miscellaneous water sources within the dock also drain to the sump and are discharged to the receiving water via pumps which are commonly referred to as drainage pumps or stripping pumps.

Sanitary Wastes - Shipboard sanitary wastes must be collected and must receive secondary treatment prior to discharge. In order to minimize the potential for leaching and other transport of metals from spent abrasive¹ and new paint, this liquid waste should not contact the floor of the graving dock

For the proper handling of shipboard sanitary wastes, several alternatives exist. One, sanitary wastes may be discharged directly to a shipyard sewer system. Two, until sewer lines are available at dockside, sanitary wastes may be discharged to a holding tank for subsequent

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¹The term spent abrasive as used throughout this rationale refers to used blast grit mixed with particles of scale, rust, old paint and marine growths removed from ships during blasting operations.

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removal from the graving dock and drainage to a sewer system. In either case preventing sanitary wastes from contacting the dock floor climinates leaching and other transport of metals from spent abrasive. Conduits for sanitary wastes have been observed leaking at their point of connection to the hull. This condition is not acceptable and water-tight connections are necessary. 计公司 不可 网络新香香茄瓜 法法证书 colul averda addigathala haquadooth boo 医勒克斯氏病 医周周的 网络白云 经公司通过主任法律

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Cooling Water - Again the objective is to eliminate the opportunity for leaching and other transport of metals. The practice of allowing cooling water to cascade to the floor of the dock is unacceptable. ·A. water-tight connection fitting at the hull and a conveyance hose are necessary. Cooling water may be discharged directly to the graving dock sump of receiving water. The important point, however, in the handling of shipboard cooling water in graving docks is to eliminate contact with spent abrasive.org bas armouling galiecil year film these sie decisions reversi just prior to flooding. Removable sedimen STRP9 STG

 $(\tilde{e},\tilde{e}) \in \mathbb{R}^{n}$ Hydrostatic Relief Water - Contact between relief water and the dock floor must be minimized to preclude leaching and other transport of metals from spent abrasive. Many graving docks are designed to allow continuous hydrostatic relief. This reduces the load on structural members thereby resulting in economy of construction. The relief water, though normally of high quality, may create problems depending on the design of the relief system. It is not uncommon for relief systems to be designed such that relief water does not contact the floor of the graving dock (11, 25). In other systems, however, relief water enters the dock at many different points and flows across the floor of the graving dock in sheetflow to a drainage gutter. In the latter case, relief water is allowed to contact spent abrasive and new paint, thus providing an opportunity for leaching and other transport of heavy metals. In-plant control in the form of collection of relief water and direct discharge to the drainage sump or receiving water will eliminate this opportunity. lucarni cwi s st lever de inin Il 11112 - 610 93 orit. ia Monusi ar

Gate Leakage - Invariably some leakage occurs around the graving dock gate. The main drainage channel leading to the sump is normally located within 100 feet of the gate. This area often times accumulates spent abrasive and new paint on the dock floor. As gate leakage water flows to the drainage channel in sheetflow, another opportunity for pollution from heavy metals is provided. The objective is to eliminate this opportunity by preventing gates leakage water from contacting spent abrastve us rates a new s differentiation to some frequency s see dostdas el taleg bio ede . Elud sile do slive treasers ten mul laboura

To solve this problem a means of intercepting leakage water must be provided. Angle iron sealed to the dock floor immediately inside the gate would be effective in conveying leakage water to one side of the dock. Once in this position, leakage water will flow to the drainage sump with a minimum of contact with spent abrasive. 41 D.C

when the start dense sains best of set to print which the set of the and shows a set and show a second the galaxies as a second ward the providence of

Marine gan wor A

real lock and grid dock floor series Floating Materials and Settleable Solids - Floating wastes are often discharged from graving docks. New paint, oil and grease, and miscellaneous floating artifacts; are carried by drainage water to the graving dock sump and may be discharged during repair activities and dewatering. Similarly, settleable solids are discharged during the above intervals vinofractivity.acantmis adds: avbrodido v i riegi - merel golian

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i braner isseres of access. The practice of allowing The discharge of floating materials and settleable solids must be eliminated. In-plant control measures may be used to eliminate the discharge of floating materials and minimize the discharge of settleable solids. These wastes may be eliminated from the sumping discharge with a baffle and weir arrangement. A baffle and weir installed in the drainage channel will trap floating pollutants and gross settleable solids for subsequent removal just prior to flooding. Removable sediment traps are station being used effectively in drainage channels (15) and may require less uis commaintenance than weirs and soal of the or of the state the

euconistos volla os bengicos als alcob palvan and evicanda subo vieroria Air Scrubber Water - Internal tank blasting results in the dischargeof ventilation air laden with particulates. Where removal of particulates is practiced, either wet scrubbers or bag house collectors are usually used at When wet scrubbers are used scrubbing waters must not contact spent abrasive. This objective may be accomplished by conveyance incof scrubbing waters directly to the drainage gutter. Where wet scrubbing in used a sump should be provided to remove particulates from the water. The use of bag house collectors eliminates this water source entirely.

prior to undocking, this material is discharged during dewatering and the floor of graving for the floor of graving and floor of graving the floor of graving and floor of graving the floor of graving and floor of graving the floor of graving and floor of graving the floor of graving are the floor of graving the floor of gr Trash - Miscellaneous trash accumulates on the floor of graving ordocks during shipbuilding and ship repair operations. If not removed v; prion to undocking, this material is discharged during dewatering and methods of accomplishing this objective are the diligent use of waste receptacles or a thorough cleanup of trash prior to flooding.

the without of the gate. Take area of two share at an a loss of the second stars Spent Abrasive and New Paint - The most significant pollutants an abrasive accumulates on the floor of the graving dock during blasting and inspainting operations is The old paint; particles, present in the used grit are a potential source of pollution. With a much greater surface area exposed than was present while on the hull, the old paint is subject to so leaching of heavy metals. The objective is to prevent the possibility for the discharge of spent, abrasive, leaching and other transport of heavy metals.

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Because blasting is followed almost immediately by painting, some new paint is also present in the form of a thin coating on the surface of the spent abrasive. The quantity of new paint mixed with spent abrasive is directly related to the quantity of heavy metals subject to leaching.

Estimates have been made of paint losses indicating approximately 5 percent of the total paint to be applied to the hull is lost to the drydock and can be discharged to the receiving water. These losses include: paint spilled within the drydock; excess applied paint which drips to the floor of the dock; overspray due to improper use of spray equipment; and wind carried paint which lands in the dock.

The discharge of heavy metals can essentially be eliminated by in-plant control measures. The primary control measure necessary is the thorough cleanup of spent abrasive prior to vessel launching. Shipyard inspections conducted by NFIC-D revealed that cleanup prior to vessel launching is currently being accomplished at several graving docks. The degree of cleanup ranges from that attainable with front-end loaders to broom clean conditions. In order to essentially eliminate the discharge of spent abrasive and consequently heavy metals, cleanup to broom clean conditions must be accomplished prior to vessel launching.

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TYPE STORE An important consideration in the cleanup of spent abrasive is timing. Dry cleanup of spent abrasive must be accomplished in order to eliminate the opportunity for leaching and other transport of heavy metals. The previously discussed control measures will enhance cleanup conditions visuby preventing water sources from contacting spent abrasive. One additional water source, that of precipitation, however, is uncontrollable. The leaching potential of precipitation bears special consideration in order to rationally determine cleanup timing. Precipitation chemistry has been studied in the inland areas of the U.S. (1,3,6,8,9,12 and 18) and on both Coasts (7,13,16 and 24). Findings indicate there is a general increase in the acidity of precipitation from west to east across the U.S. (8,14 and 18). While the pH of rainwater on the West Coast is normally 4.5 to 5.5, East Coast measurements indicate even greater acidity with pH ranging approximately one unit lower.

The fact that the above described acidic precipitation is capable of leaching heavy metals from spent abrasive, is rationale enough for making every reasonable effort to eliminate their contact. Thus, spent abrasive must be removed from the dock to broom clean conditions as soon as is technically possible. Because blasting and painting is carried out almost continuously and concurrently, cleanup likewise must be accomplished by sections as soon as blasting and painting of that section is completed.

Various cleanup techniques have been used. Small front-end loaders are effective in removing the bulk of spent abrasive and are used at many shipyards. Brooms and shovels are also used as a follow up to loaders at several yards. The suggestion has been made to treat the floors of concrete docks with an epoxy seal coat to enhance dry cleanups. Vacuum devices have been used (15), however the exceptionally large units necessary to pick up wet abrasive have proven unsatisfactory. New, smaller mobile vacuum cleaners and low profile sweepers which sweep the material into a hooper will no doubt also find application.

The disposal of spent abrasive must be accomplished in such a manner that surface water and ground water is protected. Where landfilling is the method of disposal used, strict compliance with local regulations must be maintained.

Floating Dry Docks to the webling of set offer the set of side as a contract of

is that a fact at or both , so at second second will be Ship repair and maintenance and occasionally new ship construction is accomplished on floating drydocks. A floating drydock is a structure consisting of a platform and associated ballast tanks used to raise ships above water level for work requiring exposure of the entire hull. By flooding the ballast tanks, the dock platform is allowed to sink beneath the water surface to the desired level. A ship is then moved over the dock and positioned in accordance with preset keel blocks on the dock platform. This position is maintained as the ballast tanks are devatered and the drydock floated. Floating drydocks are constructed of wood, steel or concrete and may be designed to operate as a single unit with a continuous platform or as multiple units with a sectional platform. Liquids "discharged onto the platform flow in sheetflow to the end of the dock or to intermediate outlets commonly located along either side of the platform.

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The similarities between graving docks and floating drydocks are such that the in-plant control measures and requirements for sanitary wastes, cooling water, air scrubber water, trash and spent abrasive are identical. Spent abrasive is currently being removed from some floating drydocks to broom clean conditions prior to vessel launching and the detailed requirements set forth for graving docks also apply to floating drydocks. Obviously relief water and gate leakage are water sources which do not exist on floating drydocks and are therefore not addressed. Floating wastes are not considered from floating drydocks because application of the control measures discussed essentially eliminates liquid from the working surface and thus precludes the discharge of floating wastes. At least one shipyard has provided control of wastewater by converting one of the shoreside ballast tanks to an optional holding tank, conveying wastewaters to wit by trimming the dock shoreside and pumping out the tank for subsequent 化生物性原素 医原原的 法公共 的复数运动的复数运输运输运输 医神经管理学 计算 disposal.

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A marine railway consists of an inclined groundway extending into the water with a support structure that moves on the groundway tracks via wheels or roller trains. The support unit is lowered into the water bound in the second second second second second second second second second second second second second second hoisting equipment moves the unit shoreward until the ship comes to rest on preset keel blocks. As the ship is drawn up the railway and out of the water, ballast blocks are set on either side of the keel for additional support dense to account of said additional support of the feature

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Pollutants generated in the operation of marine railways originate in the blasting, scrubbing, washing, or painting of vessels. These pollutants are carried to the receiving water by tidal action, precipitation, wind, and miscellaneous flows of water used in the work area. At railways without working platforms, pollutants fall directly to the shore or water. At platform-type railways, pollutants fall to the shore or water, either directly beyond the platform and through openings in the platform, or indirectly during platform cleanup.

To prevent pollutional materials from falling into the tidal zone or into the water, vessels on marine railways must be hauled beyond the tidal plane whenever possible. In addition, the contact of waste materials with the shore or water must be prevented to the greatest extent possible. Methods by which this may be accomplished include, but are not limited to: 1) filling or covering the spaces between planks to prevent materials from falling through; 2) use of plywood sections to cover openings along the keel; 3) use of shrouding or temporary platforms under the stern.

Materials which contact the shore must be removed frequently to prevent their being washed into the receiving water. This can be accomplished by use of small front-end loaders or shovels. Cleanups can be expedited by installation of a smooth impervious surface beneath the way. A weir located in the tidal zone behind the ship would retain much of the spent abrasive that had escaped removal from shore. Such a weir should extend as high above the ground surface as possible without interferring with railway operation. Accumulated solids would be removed frequently from behind the weir.

Shipways

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The term shipway is sometimes used synonomously with graving dock as defined earlier in this rationale. However, for purposes of this rationale, shipway is herein defined as a way which is used for the construction of new ships. Normally inclined, the shipway may be either entirely above water level or it may be partially below the water surface and isolated from the adjacent waterway by means of a gate.

For a description of the water pollution control measures applicable to shipways reference is made to earlier sections of this rationale. Specifically, shipways entirely above water level are analogous to marine railways and the appropriate rationale applies. On the other hand shipways partially below water level are very similar to graving docks and thus the graving dock rationale applies.

Vertical Hoists

Various types of vertical hoists are used at small boat repair facilities. Boats are lifted from the water and moved to an area on shore where the repair work is accomplished. Wastes generated at the repair area include marine growths and old paint removed from boat hulls.

The control measures presented previously in this rationale are also applicable to these small boat tepair facilities and must accomplish 「家」となったの the elimination of repair wastes from entering the receiving water. Control must accomplish thorough cleanup to broom clean conditions of old paint and abrasive where applicable.

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regimmential flat crosses to 网络美国教育学校 人名英格兰人名英格兰人名 网络拉拉美国人名法格 COMPLIANCE DETERMINATION " where also that the there are an interested

Selection of Pollutant Parameters

Major categories of wastewater parameters of pollutional significance 12202 for the shipbuilding and repair industries include: n an cenal notice to anode did ditud Solids suspended by which are not account to a star of the barden ちらまでかくぶ コロア 1. settleable solids to an address in address in antilit (1 at algiusian instru 2. Metals (particulate and dissolved) (here and dissolved) the boalt if use of shrauling or tasherary ST932 31 1. lead 2. chromium Imaging ad Jean produced Logano folde sighted ad i foundiy to arsenic an an **a** (

an entrance the adde bodeen acted right thereing copper an anti-analysis of the set of the se diament of blowercu this finance oso egandolu se marging to the table of a second by the second the second seco rista retain doug . ansaid . at mon hugaone but fadt offeanin unage all the fishing cadmium Oil and grease lange and should hat he bandes bibede his h Flow (volume of discharge) they but wolded south (this proje) pН

Other parameters not listed may be of significance in on-shore facilities employing production processes covered by established effluent 1000 guidelines. These parameters will be included by application of the individual treatment standards and monitoring requirements developed for the appropriate industrial category. For example, if a shipbuilding 法律师的 facility included a discharge from a metal plating operation, guidelines for the metal plating industry would be applied. In addition, compliance with established federal, state, and local regulations for the treatment, pretreatment, and monitoring of other wastes (such as sewage and cooling つぎきもうとえ

water) will be required. mailman of abas of alastador by smith o spectrically, shipways entroly above water (e Basis for Selection strantzer statugorgas sit bed equalibre origina inite viters are least iteration welde villeteren evenueles. Solids carlege alongether doeb gaiving and and ther

Much of the pollutional material emanating from shipyards, especially repair facilities, is in the form of solids. Blasting abrasives, dry paint and primer, and marine fouling organisms form the bulk of these solids, which may be either suspended or settleable.

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usde huinse mund-20 p set Materials containing heavy metals are used extensively on ships and in shipyards to inhibit fouling and boring marine organisms and to (Alege y inhibit corrosion. Red lead and zinc chromate are widely used primers. Antifouling paints depend on the toxicity of heavy metals for their effectiveness; copper, tin, mercury, and arsenic may constitute a significant portion of antifouling paints. When ship hulls are refinished old antifouling paints and primers are removed, and some of this material may enter the water either as solids or dissolved pollutants. Arsenic compounds are applied to wooden structures to inhibit marine boring organisms, and, industrial grade zinc commonly contains han cadmium, All of these pollutants may enter waterways from shipyards in quantities damaging to the marine environment.

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Bilges, ballast and fuel tanks, engines, and metal fabricating operations (such as colling mills) are potentially significant sources of oil and grease in shipyards.

To assess the quantities of pollutional materials in liquid discharges, it will be necessary to quantify the volumes of water discharged. pH

To protect aquatic life, the pH of wastewaters from shipyards should be between 6 and 9 standard units.

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Graving docks - to determine the quantity of wastes discharged, water samples will be collected monthly during flooding and dewatering of graving docks for undocking. Samples will consist of composites of grab samples collected at 15-minute intervals during flooding and dewatering periods sufficient to characterize the wastes. During the flooding process, samples will be collected from the flooding ports. During the dewatering process, samples will be collected from the discharge ports (if not submerged) or from the dewatering pumps. The volumes of flow, and parameter concentrations will be reported for both the flooding and dewatering process in order that net pollutant loads can be ascertained. Samples will be analyzed for suspended and settleable solids, particulate and dissolved metals, oil and grease, and pH. Total volume of water flooded and discharged will be calculated for each undocking and will be reported.

Once per month, samples will be collected of drainage wastewaters (relief water, gate leakage, shipboard wastes, wash water, precipitation, etc.) discharged from graving dock sumps. During a 24-hour period when conditions of greatest pollution potential exist (when hulls are being sandblasted or painted and during periods of heavy rainfall if they occur), a sample will be collected from each drainage. The pH of each of these samples will be measured, and a sample will be analyzed for oil and grease content. These grab samples will then be composited and analyzed for suspended and settleable solids, and particulate and dissolved metals. The volume of water discharged from the sump pump during the 24-hour - diag period, and the total volume discharged during the month, will be reported.

If sanitary wastes are collected and discharged to publicly owned facilities, established pretreatment and monitoring requirements will be met. If treated sanitary wastes are discharged to the receiving water, monitoring conditions imposed in the effluent guidelines for secondary sewage treatment facilities will be required.

Floating Dry Docks, Marine Railways and Other Ship Repair Facilities -Because the control of process wastes from dry docks, marine railways and other repair facilities will require the diligent application of efficient housekeeping procedures, monitoring will consist of surveillance. To assure that the WATER POLLUTION CONTROL PLAN for the facility is followed strictly, frequent unannounced verification inspections will be conducted by the permit issuing agency. Further, it will be a condition , នៃសន្ឋបន្ទរល of all permits issued to ship repair facilities that a responsible company official certify monthly that all conditions of the WATER POLLUTION CONTROL PLAN have been applied without material deviation.

Shipbulding Facilities saudite braheles i tela B anarras

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Those facilities with graving docks or partially submerged shipways will be required to monitor flooding, dewatering, and sump discharges twice annually in the manner required at facilities used for ship repair. Monitoring of shipway drainage discharges shall be conducted during periods of greatest pollutional potential (i.e., when hulls are primed or painted and during periods of heavy rainfall if they occur). Parameters to be measured and sampling schedule during a 24-hour period shall be as required for graving dock drainage discharges.

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Compliance Schedule

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The permits to be issued under this guidance will cover repair facilities and graving dock or shipway portions of shipbuilding 2. O. P. facilities. Other portions of shipbuilding facilitles should be covered by other guidance or final or proposed effluent guidelines.

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Ship repair facilities and construction facilities with graving docks or shipways will be required to submit a WATER POLLUTION CONTROL PLAN to the permit-issuing agency. The plan must give consideration to all of the factors discussed in the rationale section of this document, emphasizing ways in which wastewaters may be segregated and spent abrasive, old paint and primer, and other solids may be removed from the facility. It is anticipated that the plan can be submitted within three months after the date of permit issuance and implemented (segregation of wastewaters and instigation of housekeeping procedures) within six months of the date of permit issuance.

^{-1/3}Control of sanitary wastes will require inclusion in the above PLAN, in that interim disposal methods must be devised to prevent the discharge of sanitary wastes to dock surfaces. In addition, all sanitary wastes ultimately must receive secondary treatment. At shipyards that do not presently have on-shore facilities for sanitary waste treatment or transport of wastes to such facilities, secondary treatment will be achieved by June 30, 1977, with submission of construction schedules within six months after the date of permit issuance and submission of progress reports at six-month intervals until implementation of secondary treatment or pretreatment. Shipyards with existing facilities will be required to meet more stringent schedules and achieve implementation at earlier dates.

Monitoring of discharges from shipyards will commence immediately after issuance of the permit. Monitoring data will be submitted twice annually to the permit-issuing agency. Monthly certification of compliance with the PLAN will be retained by the permittee, with copies submitted twice annually to the issuing agency, however, material deviation from the PLAN will be reported to the permit-issuing agency immediately.

APPLICATION OF RATIONALE TO NPDES PERMIT ISSUANCE

The control of process wastes from the flooding and dewatering phases of graving docks and shipways, and from floating dry docks, marine railways, and other repair facilities depends on segregation of wastewaters and collection and disposal of spent abrasive and other solid materials. As an NPDES permit condition, the permittee will be required to submit within three months after time of permit issuance a detailed WATER POLLUTION CONTROL PLAN to the permit-issuing agency and to initate commitments within the plan within six months after permit issuance. Such plan must give detailed consideration to all appropriate factors discussed in the Rationale section of this document, emphasizing specific methods by which wastewaters will be segregated and waste solids will be collected and removed. Compliance monitoring will consist of surveillance; that is, frequent unannounced inspections which will be conducted by representatives of the permit-issuing agency. In addition, a responsible company official will certify compliance with all conditions of the plan on a monthly basis. Failure to comply with all conditions of the WATER POLLUTION CONTROL PLAN will be considered a violation of the permit, requiring evaluation for potential enforcement action.

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Self-monitoring, as detailed in the Compliance Determination section of this document, of graving dock and shipway drainage discharges will require sampling (monthly at repair facilities, twice annually at shipbuilding facilities) of wastewater discharges. Monitoring will commence immediately after issuance of the permit and will continue until the expiration date of the permit. Self-monitoring data in conjunction with compliance monitoring inspections will be used to determine compliance with the plan and with other conditions of the permit.

Treatment and monitoring of waste discharges covered in established effluent guidelines (such as those for cooling water discharges, etc.) must conform to the requirements of the appropriate waste category. In addition, compliance with established federal, state, and local regulations for treatment, pretreatment, and monitoring will be required.

Initial permits will not contain specific effluent limitations. However, if monitoring data indicate that such limitations are warranted, the permits may be modified to include limitations.

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AUTHOR ZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

nati M In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"), and appropriate state statutes 1010

XYZ Shipyards, Inc.

is authorized to discharge from a facility located at

Pier 999

San Diego, California 92100 X 4 X X X X

to receive waters named

San Diego Bay

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts 1, 11, and 111 hereof.

This permit shall become effective on January 1, 1975.

÷71 This permit and the authorization to discharge shall expire at midnight, December 31, 1979.

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EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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PART 1 calculated⁽¹⁾ <u>Monitoring Requirements (2)</u> the permittee is authorized to discharge from waste source(s) serial number(s) 001 (graving dock used for Page 23 ST012345 2 of composite composite composite composite composite composite composite composite composite composite composite composite Përmit No Samp le fo facilitate calculation of net discharge of pollutant loads, samples will be taken at IS-minute Type grab intervals during flooding and dewatering before and after undocking a ship. Total volume flooded and total volume discharged (other than drainage discharges) will be calcu-5 Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at the flooding ports and at the discharge ports (if not submerged) Measurement Such waste source(s) shall be limited and monitored by the permittee as specified below: 1/month⁽³⁾ F requency /month /month /month /mon th l/month /mon th /month /month /month l/month /month /month /month Daily Max Other Units (Specify) and lasting through 6/30/75 N/A N/A N/A N/A N/A N/A N/A NA N/A N/A N/A A/N N/A N/A Discharge Limitations (1) Daily Avg A/A N/A N/A N/A N/A N/A N N/A N/A Daily Max +kg/day (1bs/day) N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A Da 🖬 y 🖁 Avg 1/1/75 N/A. N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A A/A (mon th During the period beginning pH shall be monitored lated for each month. Effluent Characteristic and dissolved) Metals (particulate settleable solids See Part 111-1. suspended solids dewatering pumps. chromium arsenic cadmium nercury 0il and grease copper ship repair). Flow (volume) zinc lead ц. Т Solids The I (E) Ξ 5

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EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning 7/1/75 and lasting through 12/31/79 . the permittee is authorized to discharge from waste source(s) serial humber(s) 001 (graving dock used for ٦ Such waste source(s) shall be limited and monitore

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as specified below:	Monitoring	1	Measurement	Frequençy	1/month(3)	l/month	l/month	1/month		1 /month:	J /month					1/month	- 1/month	1/month			standard units		trace amolinte		shall he taken		ייאר שמחוותו אכם			be taken at 5-minute		discharges) will be
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	Effluent			Flow (volume)	Solids	suspend	settlea	Metals (цъ		ບ	ι τ	Ū	Ν.	Ē	ų	Ŭ.	0il and grease		The pH sh	be monito		There she		Samples t		dewatering pumps.		(1) See P	(2) 10 Ta	(3) Total	culat

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PART 1

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FART :

4/1/75

7/1/75

Page 4 of 23 Permit No. ST012345

108 11 STA SCHEDULE OF COMPLIANCE Ser La 1 No 00 0 Β. 1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule: Submit WATER POLLUTION CONTROL PLAN(1) Implement PLAN

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Certify compliance with PLAN(2)

8/1/75, monthly thereafter

Submit copies of compliance certification

1/1/76 (6-month interval thereafter)

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2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

(1) See Part 111-2. (2) See Part 111-3. 1 2 1 1 4 1 T

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	EFELUENT LIMPTATPONS AND MONITORING REQUIREMENTS DE LUS
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	EFFLUENT LIMITATIONS

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for During the period beginning 1/1/75 and lasting through 6/30/75 the permittee is authorized to discharge from waste source(s) serial number (s) 002 (graving dock used Such waste source(s) shall be limited and monitored by the permittee as specified below: Fff.lariant/ Ch

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ments	Sample Type Galculated	composite composite composite	composite composite composite composite composite	composite composite composite grab(3)	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	of 23 No. ST012345
lequire	Sam Ty Cel			compos compos compos grab(3	rval s	K K
<u>Monitoring Requirements</u>	ement ency th(2) th				e taken at inter shall be taken a	graving dock metals. drainage
	Measurement Frequency 1/month(2)	1/month 1/month 1/month	<pre>//month //month //month //month //month</pre>	1/month 1/month 1/month 1/month	taken a	
Fv) (**	Max		e in ja in ja	1941 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944	ve st	e of ds e t
(1) (Specit	baily Max N/A N/A	N/A N/A	A A A A A A A A A A A A A A A A A A A	N/A/ N/A/ N/B/		sample for st
Discharge Limitations (1) day) Other Units (Specify)	Avg t	(A (A (A) (A) (A) (A) (A) (A) (A) (A) (A			the monitoring requirements specified draving draving discharies	t pollutional potential exist, a sample of each 24-hour period will be analyzed for solids and 1 be made on grab samples taken from one of the
e Limit Other	baily Avg N/A N/A	N/A N/A N/A	N/A N/A N/A		<pre>// At least three (3) pH measuren // // // // // // // // // // // // //</pre>	test pollutional potential ex a 24-hour period will be an
<u>scharge</u> /)	la×°	ini Ali Ali Ali Ali Ali Ali Ali Ali Ali Al	•		ree (3) requir rainad	poten grab s
	Dai'Ty Max N/A N/A	N/A N/A N/A	N/A N/A N/A	N/N N/N N/A	least three nitoring re	lutional potent bur period will made on grab se
kg/day (Tbs/	and and and and and and and and and and		i An Sea Din Ian J	و المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع الم	y. V At le d. V h V the moni the moni	est pollt a 24-hot ill be me
	Da 1	N/A N/A N/A N/A	N/N N/A A/N A/A	N/N N/A A	ith the q	រ ហ៊ួល ~
200 200 200				1	ling pe ance w s): at	Lremen d Lremen d L
erist	and the second	ds ate ved)	• .		compli	dition dition e meas s.
Etdlauent, Chanač terfistiko (*) 1. 191 Lealeres Barso ja 2005 (suus)	Flow (volume) 55 Solidsoutte of mark suspended teol the	Settleable solids Metals (particulate and dissolved) lead	chromium arsenic copperation zincea	tines cadmiumscoperation 014:and grease provide The officer of the officer	<pre>spaced during the sampling period spaced during the sampling period famples taken in compliance with the following location(s): at the</pre>	 See Part [1]-1. When (if) conditions of greatest drainage pumping cycle during a 2 (3) 011 and grease measurements will pumping cycles.
euent, C	t, (volu ds∵it dshaad	tileable ls (part and di lead	chr ars cop zier	cadmium cadmium and grease	aced during th aced during th bles taken in following lo	cee Par hen (1 lrainag ril and umping
	F low Soli	set Meta	•	0ilie The r	space Samp1 the f	(1) (1) (1) (1) (2) (1) (2) (1) (2) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2

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The total volume of drainage discharged during the 24-hour sampling period, and during the

month, will be reported.

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the permittee is authorized to discharge from waste source(s) serial humber(s) 002 (graving dock used for C LIMITATIONS ... Monitoring Requirements Other Units(Shorif...) 1.82 Such waste source(s) shall be limited and monitored by the permittee as specified below: ທີ່ເປັນຂໍ້ຮັບບໍ່ເປັນຮູ້ຮູ້ແມ່ນ ທີ່ເປັນ ແລະ ພະສຸດທີ່ Lasting: through 12,31,731,73 े <u>क</u> 2011 Dames Ro/dav (1bs/dav) http://dav したのは、大の A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS 2.41 s During the period beginning 7/1/75 化合合合物 化化合合物 化合合物 化合合物 Effluent Characteristic ship repair). 000

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	Sample	Type	calculated ⁽⁴⁾	composite	compos i te	composite	composite		composite	COMPOS I FO	Composite		COMPOSITE	COMPOSITE		composite	orab (3)			spaced		rmit 1	of Io.	23 STO	123	45
	Measurement	Frequency,	l/month(2)	l/month	l/month	1/month	l/month	A wayses a second	///nonth	Nmonth	l/ronth	1/month	1/month	1/month	1/month	l/month	1/month		standard units	Intervals equally	floating solids or visible foam in other than trace amounts.	shall be taken at		gravîng	and metals.	une arainage.
Uther Units (Specify)		Daily Max	N/A	N/A	NZA	N/A	N/A	10 17 75	N/A	N/A	N/A	W/A	N/A	N/W/A	NV/A	N/A	N/A	1. A. A. A. A. A. A. A. A. A. A. A. A. A.	than 9	e taken at int	in other than	ecified above ge		, a sample of each	zed for solids	
?		Dai	N/A	N/A	N/A	N/A	N/A		N/A	N/A	. ANVA	A'NV'A	N/A	N/A	N/A	N/A	N/A	19 N 19	nor grea		visible foam	oring requirements spec dock drainage discharge		otential exist	will be analy th samples tak	
Kg/day (Tbs/day)	:	g uaily Max	N/N	N/N	N/A	N/A	N/A		N/A	N/A	N/A	A/N/A	N/A	N/A	NA	N/A	N/A		sta (2)		ing solids or	he monitoring re graving dock dra	and with total	pollutional po	4-hour period be made on gra	
kg/ d		DALIY AVG			N/A	N/A	N/A		N/A	N/A	N/A.	N/A.	N/A	N/A	N/A	N/A	N/A		s than 1 6 At least three			ance with the s): at the gr		s of greatest	rements will	
					suspended solids	settleable solids	Metals (particulate	cand dissolved)	i jead	္ေ chronium	arsenic.	<pre>copper</pre>	2 2 1 a c	mercury	· stån	ses cadm hum 240	્∞0 №] *and*grease> °		Thé pH shall nót be less than to monitored monthly At less	during the sampling period.	There shall be no discharge of	Samples taken in compliance with the monitoring requirements specified above the following location(s): at the graving dock drainage discharge)		(2) When (1f) condition:	(3) 011 and grease measurements will be made on grafication for	pumping cycles.

(4) The total volume of drainage discharged during the 24-hour sampling period, and during the month, will be reported. SAR374350

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22 16 P 6004 1.1 B. SCHEDULE OF COMPLIANCE - Secial No. 002

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- 0 0 - 0 0 1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Submit WATER POLLUTION CONTROL PLAN(1) 4/1/75 Implement PLAN 7/1/75 Certify compliance with PLAN(2) 8/1/75, monthly thereafter Submit copies of compliance certificates 1/1/76, 6-month intervals thereafter tin tin tin tin 10000 (法 (注) 一曲 and Second Mark 59 - S. Se blag 5.5 434 No later than 14 calendar days following a date identified in 2. the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement. Ç.

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(1) See Part 111-2 (2) See Part 111-3

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		PART I
per for the for the for the for the for	Requirements (2) Sample Type composite composite composite composite composite composite composite composite composite composite composite composite composite composite composite composite composite	Page 8 of 23 Bermit No. ST012345
(graving below:	Monitoring Re Measurement Frequency 2/year 2/year 2/year 2/year 2/year 2/year 2/year 2/year 2/year 2/year	erged) or erged) or a taken at a ship.
5/30/75.	Decify a contribution of the contribution of t	ified above ts (if not samples wi after undoc
asting through 6/30/75.	D:scharge 1 Imitations (1) D:scharge 1 Imitations (1) Y Max Dother Units (Specify) Y Max Doily Avg Daily Max Y N/A N/A N/A Y/A N/A N/A	cements spec cements spec ischarge pou ischarge and before and
IREMENTS and las from waste d monitored		nitoring r ports and scharge of and dewate
NG /75 sch	kg/day Daily Avg N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	the oodi net oodi
A. EFFLUENT LIMITATIONS AND MONITORI During the period beginning 1/1 the permittee is authorized to di shipbuilding) Such waste source(s) shall be lim	Effluent Characteristic k Flow (volume) Daily Solids w/v suspended solids w/v settleable solids w/v settleable solids w/v hetals (particulate w/v and dissolved) w/v lead chromium arsenic w/v copper zinc w/v copper zinc w/v diad dissolved w/v lead chromium w/v copper zinc w/v tin mercury tin w/v tin grease w/v The pH shall be monitored 2/year.	Samples taken in compliance with the mo the following location(s): at flooding ing pumps. (1) See Part 111-1. (2) To facilitate calculation of net di 15-minute intervals during flooding

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PART I

	د 1947 1959	(graving dock used for		ing Regultramager (2)	. L		cy Type		compos i te		composite	Structure Composit te			composite		, , ,	ليه اد		composite	9ľab		IL be monitored				raken at n.o. or dewater-	of No.	2 57	1	ar 12-mindure	
e trans Settern fi	12/31/79	number(s) 003 (gra	as specified belows		2	Σ	Vax F		9 6	، ۲	N/A Z/year		N/A 2/VASE	10	ы Э - С	si);	- 6		99 		N/A 2/year		uaro units and shall	5 A) 49 - 1	r than trace amounts	shows that	f not submerced)			commiss will be toba	a ship.	
· *	and lasting through 12/3	serial	permittee	Discharge Limitations ⁽¹⁾	Other Units(Specify)		5/		N/N	•	•		N/A S	•		N/A.	N/A				N/A	- - - -	Standard		visible foam in other	Lrements snarifiad	apeur r	 . - -			0	
ITORING REQUIREMENTS	7/1/75 and las	discharge from waste source(s)	limited and monitored by the	∵eha 1stha	kg/day (lbs/day)	ć	המו	A/A A/A		•			A N/A	A N/A				•		A N/A	N/N	standard unite nor of		and a state of the	floating solids on vis	he monitoring redu	flooding ports and at			net discharge of pollutant loads	dewatering before and	
		t t		ceristic		0.11. A			•	· .			N/A	N/A	N/A	N/A	N/A	N/A			N/N	Ś)			Samples taken in compliance with the monitoring requirements	cation(s): at floo			٥f	and	
EFFLUENT LIMITATIONS AND MON	During the period beginning	the permittee is shipbuilding)	Such waste source(s) shall be	Effluent Characteristic			Flow (volume)	Solids	suspended solids	settleable solids	Metals (particulate	and dissolved	lead	chromium	arsenic	copper	zinc	mercury	11A	o'il bod annum	ull and grease	The pH shall not be less than	2/year.		There shall be no discharge of	Samples taken in	the following location(s): at	ing pumps.	Coa Dart	(2) To facilitate calculation	intervals dur	-

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PART 3

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SCHEDULE OF COMPLIANCE -Serial No. 003

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See Part 111-2 (2) See Part 111-3

(1)

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Submit WATER POLLUTION CONTROL PLAN (1)	4/1/75
Implement PLAN	· · · ·
Certify compliance with PLAN(2)	8/1/75, monthly thereaft
Submit copies of compliance certification	1/1/76, 2/year thereafte

No later than 14 calendar days following a date identified in 2. the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

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(3) (2) (4) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS 4

During the period beginning 1/1/75 and lasting through 6/30/75 the permittee is authorized to discharge from waste source(s) serial number(s) 004 (shipway with drainage

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	keb/eay	kg/day (1bs/day)	<u>Discharge Limitations''</u> day) Other Units(Specify)	s (Specify)	<u>Monitoring Reg</u>	Requirements
					Measurement	Sample
	a l	Daily Max	Daily Avg	Daily Max	Frequency	Туре
	N/A	N/A	N/A	N/A	2/year (2)	calculater
	N/A	N/A	N/A	N/A	2/year	composite
suspended solids	N/A	N/A	N/A	N/A	2/year	composite
settleable solids	N/A	N/A	N/A	N/A	2/vear	
Metals (particulate	N/A	N/A	N/A	N/A	-/ 1 YUDA -	
and dissolved)				2	1 heat 17	compos I te
lead	N/A	N/A	NVA	N /D	2.00.2	
Chromium	N/A	N/∆	N 2 N		z/year	compos I te
	N/W			A / N	2/year	compos i te
	4/N	T / M	N/A	N/A	2/year	composite
copper	N/A	N/A	N/A	N/A	2/year	composite
zinc	N/A	N/A	N/A	N/A	2/year	composite
mercury	N/A	N/A	N/A	N/A	2/vear	COMPACITA
	N/A	N/A	N/A	N/A	2/vear	
cadmium	N/A	N/A	N/A	N/A	2 /vear	
011 and orease	N/A	N/A	N / D	N/N	2/1025	
					1 year	grap///
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Canoles tobec lo completence						ge rm
the following computance with			IFrements spec	specified above s	shall be taken a	1 I t
The Introduction recardings.	at snipway drainage	Irainage discharge	large.			
「「「「」」「「「「「「「「」」」」」「「」」」「「」」」」「「」」」」」」」						of o.
(]) ~ See Part 4 -). /						
(2) When (11) conditions of gr	greatest pollutional	lutional pote	potential exist,	a sample of e	exist, a sample of each shipway drainage	TO
(3) 01] and grease measureme	ents will be	made on crah	will be made on rish samilar follow from and metals.	from one of	•	
			navel cardines	IT OT OT OT	the drainage pum	45 Gu I dwnd
			•			

- 0il and grease measurements will be made on grab samples taken from one of the drainage pumping cycles. 3 (7
- The total volume of drainage discharged during the 24-hour sampling period, and during the month, will be reported

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PART I

With draft	Requirements	Sample Type calculater composite composite	· · · · · · · · · · · · · · · · · · ·	composite composite composite composite composite composite	composite composite grab(3) and shall	Page 12 of 23 Permit No. ST012345 build bu
ສູງການເຊັ່ງ (() () () () () () () () ()		Neasurement Frequency 2/year (2) 2/year 2/year	2/year 2/year	2/year 2/year 2/year 2/year 2/year	2/year 2/year 2/year 2/year standard units	Multure hall be taker ach shipway d stals. the drainage and during t
s lasting through 12/31/79 5 ste source(s) serial humber(s) 004	tee as (1) (Specif	Daily Max N/A N/A N/A	A A	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	N/A N/A N/A + than 9	n other than cified above solids and from one of pling period
t îng through source(s) sé	the Limit Other	Daily Avg N/A N/A N/A	N/A NA	A A A A A A A A A A A A A A A A A A A	N/A N/A N/A s nor.greater	
U I REMENT	l and monitored by <u>Discharge</u> v (lbs/day)	Daily Max N/A N/A N/A	N/A A A A A A A A A A A A A A A A A A A	22222222 222222 222222	N/A N/A N/A standard units	ds or age dis age dis and po on gra uring
	be limited	Daily Avg N/A N/A N/A	N/N A A A A	A A A A A A A A A A A A A A A A A A A		oati the ipway ipway ijl b isch
ons A begi autho	age discharge), sha]l be li Such waste source(s) sha]l be li Effluent Characteristic), to share the second se	eable solids (particulate and dissolved)	n n n n n n n n n n n n n n n n n n n	less	be monitored 2/year. There shall be no discharge of floating soli Samples taken in compliance with the monitor the following location(s): at shipway drain (1) See Part 111-1. (2) When (if) conditions of greatest pollutic age pumping cycle during a 24-hour period (3) 011 and grease measurements will be made cycles. (4) The total volume of drainage discharged d
EFELUENT LINITATI)))))))))))))))))))	age discharge). Such waste source Effluent Characte	Flow (volume) Solids suspended solids	settieable solids Metals (particulate and dissolved	tead chromium arsenic copper zinc zinc	The pH shall not be	be monitored 2/year. There shall be no di Samples taken in com the following locatil (1) See Part 111-1. (2) When (if) conditi age pumping cycle (3) 011 and grease me (4) The total volume

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PART 4

4/1/75

7/1/75

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B. SCHEDULE OF COMPLIANCE - Serial No. 004

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Submit WATER POLLUTION CONTROL PLAN(1)

Implement PLAN

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Certify compliance with PLAN(3)

8/1/75, monthly thereafter

1/1/76, 2/year thereafter

Submit copies of compliance certification

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

> \$ \$ \$ \$ \$

See Part 111-2
 See Part 111-3

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dock), ents(2)	A. C. Isk Soo	Page 14, of Permit No	F 23 ST012345
terne (**≾sone Terlige) (Personalise terlige)	iw accorrections available available available available available available available available available avai	idae (feda ystalmiss and) cala saf balticese smoly slobedoa	
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ins ins through 6/30/75 waste source seri ility). ed by the permitt ge timitations (1)	anite(c) besk a	sovelue (f Asd) total of t. C foreleverse (vice sci	\$
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ions AND MON beginning authorized ay) and 007 shall be 1 shall be 1	and Part		
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B. SCHEDULE OF COMPLIANCE - Serial No. 005, 006 and 007

 The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Submit WATER POLLUTION CONTROL PLAN⁽¹⁾

Implement PLAN

7/1/75

4/1/75

Certify compliance with $PLAN^{(2)}$

8/1/75, monthly thereafter

Submit copies of compliance certification 1/1/76, 2/year thereafter

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

(1) See Part 111-2
(2) See Part 111-3

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C. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

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2. Reporting

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Monitoring results obtained during the previous 6 months shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postamarked no later than the 28th day of the month following the completed reporting period. The first report is due on 8/1/75. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

All recurds and information newnetics of a second toolig activites regulred by this point including all records of anaryses, articrand and callbration and matricalance of instrumentation and recordings "free reads books for corris instruments in a constant be retained for a minimize of these (3) years, or so profil for our law the Keglona that distrator or the desire parent of the retained for

3. Definitions

4. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date, and time of sampling;
- b. The dates the analyses were performed;
- c. The person(s) who performed the analyses:

PART 1

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The analytical techniques or methods used; and d.

e. The results of all required analyses. 作。AN是SETABRARA 6. Additional Monitoring by Permittee

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If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring uninosin shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequecy shall also be indicated.

Becords Retention distant estapes crosss lots for the the ent) 9:

> All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings. from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

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> to the dates the sections were performed. n saary soo add tow not the release and the second version

PART 11

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A. MANAGEMENT REQUIREMENTS

1. Change in Discharge

sv doll definitions ve the statistic of the All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a and inviolation of the permit. Any anticipated facility expansions, bes production increases, or process modifications witch will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of becomes such changes. Following such notices the permitimay be modified at itsis to specify and limit any pollutants not previously limited.

203 TABLETTO (TA TROPAN OF ESTADE TORRESS AT TO DECORE.) 2. Noncompliance Notification and a most a landsmanner

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified and the second of the permittee shall provide the Regional Administrator. and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

of service as a transfer of whether all all or which and a. A description of the discharge and cause of noncompliance; and

Prefoldbur Dopanos assesses b. The period of noncompliance, including exact dates and times; the back some light, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce,

eliminate and prevent recurrence of the noncomplying discharge.

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The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

and and the Adverse Impact to the other which it is the second

The permit tee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance and show with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determany imine the nature and impact of the noncomplying discharge.

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PART II

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5. Bypassing

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Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

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Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

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sounder find (model in order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Sector (2000) Partol, provide an alternative power source sufficient to operate the wastewater control facilities;

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b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

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The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized water representatives, upon the presentation of credentials: construction of ordentials: construction of the permittee's premises where an effluent construction of the permittee of the second state required to be constructed where the terms and conditions of this permit; and

> b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

PART 11

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2. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. Availability of Reports

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 $v \in \mathbb{C} \setminus \{0,0\} \}$ Except for data determined to be confidential under Section 308 计单数代表式 网络外口 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

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standard #4. Permit Modification is well state state was the state

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following: The Adding of Bandhard and Bandhard

a. Violation of any terms or conditions of this permit; and to Proven a basing to

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

> c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized

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Notwithstanding Part 11, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit it successful asshall be revised or modified in accordance with the toxic effluent 人名法斯特 化氯化物 法公司 standard or prohibition and the permittee so notified.

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6. Civil and Criminal Liability

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7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

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● ● ● ● ● ● ● ● ● ● ● ● ● ● Nothing in this permit shall be construed to preclude the insti-1.6616172 tution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

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24 Y 640 18.3 L 9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

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The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit. assista invishall not be affected thereby and anonecaditured

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THER REQUIREMENTS IN AND INC. THE WAS ADDRESSED TO A DESCRIPTION OF THE ADDRESS O insultion along Discharge limitations are not established at this time. However, if monitoring results establish that discharge limitations are warranted, this permit may be modified to include such limitations.

> 2. The permittee shall submit a WATER POLLUTION CONTROL PLAN for graving docks, shipways, floating dry docks, marine railways, and other

> > (Continued)

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OTHER REQUIREMENTS Continued

- 2. ship repair facilities. Such PLAN must give consideration to all of the factors discussed in the "Rationale for Water Pollution Control at Shipbuilding and Ship Repair Facilities" supplied with this permit, emphasizing segregation of wastewaters and cleanup and removal of waste solids from the facility.
- 3. A responsible company official shall certify monthly that all conditions of the WATER POLLUTION CONTROL PLAN have been met.

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NPDES PERMIT MARINE SEDIMENT MONITORING AND REPORTING

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* Appendix sections are separated by color coded pages

APPENDIX C

Lab Reports and Related Documents

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In response to the State Water Resource Control Board Order No. WQ-88-4, the San Diego Regional Water Quality Control Board (<u>SDRWQCB</u>) has determined that a sediment monitoring program shall be added to the National Pollutant