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1 This Consent Decree ("Decree") is made and entered into by and
2 among the United States of America (the "United States"), on
3 behalf of the Environmental Protection Agency, National Oceanic
4 and Atmospheric Administration, the Department of the Interior
5 and Settling Federal Agencies, and Settling Defendants.

6 I. BACKGROUND

7 A. The United States, on behalf of the Administrator of the
8 Environmental Protection Agency ("EPA"), the Secretary of
9 Commerce and the Secretary of the Interior, has filed a civil
10 action for recovery of response costs and natural resource
11 damages, and for injunctive and declaratory relief, pursuant to
12 Sections 106 and 107 of the Comprehensive Environmental Response,
13 Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9606,
14 9607, with respect to releases of hazardous substances from a
15 former pesticide formulating and packaging facility now known as
16 the United Heckathorn NPL Site in the City of Richmond, County of
17 Contra Costa, State of California.

18 B. Before the United States filed suit in this matter,
19 several related actions had been pending in this Court arising
20 out of the release or threat of release of hazardous substances
21 from the Site, namely Levin Metals Corporation v. Parr-Richmond
22 Terminal Co. and related actions, Case Nos. C 84 6273; C 84 6324;
23 and C 85 4776 ("Private Party Litigation"). The Honorable
24 Claudia Wilken ordered the parties in the Private Party
25 Litigation, and invited EPA, to engage in mediation to attempt to
26 settle matters. From October 1994 through January 1995, EPA, the
27 Settling Federal Agencies and the private litigants participated

1 in alternative dispute resolution ("ADR") mediated by Judge
2 Coleman Fannin (Ret.) and Lester Levy of J.A.M.S. Endispute, a
3 private firm offering ADR services. This mediation process
4 involved sustained, vigorous and substantial negotiation among
5 the parties. As a result of the mediation and subsequent
6 negotiations, the United States has reached four settlement
7 agreements in principle regarding the Site with potentially
8 responsible parties, including with Settling Defendants ("Four
9 Decrees").

10 C. In accordance with the National Contingency Plan ("NCP")
11 and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F),
12 EPA notified the State of California (the "State") of
13 negotiations with potentially responsible parties regarding the
14 implementation of the remedial design and remedial action for the
15 Site, and EPA has provided the State with an opportunity to
16 participate in such negotiations and be a party to this Consent
17 Decree.

18 D. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C.
19 § 9622(j)(1), EPA notified the federal natural resource Trustees,
20 the Department of the Interior and National Oceanic and
21 Atmospheric Administration, of negotiations with potentially
22 responsible parties regarding the release of hazardous substances
23 that may have resulted in injury to the natural resources under
24 federal trusteeship.

25 E. Settling Defendants do not admit any liability to the
26 Plaintiff arising out of the transactions or occurrences alleged
27 in the complaint, nor do they acknowledge that the release or
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1 threatened release of hazardous substances at or from the Site
2 constitutes an imminent or substantial endangerment to the public
3 health or welfare or the environment. The United States on
4 behalf of the Settling Federal Agencies does not admit any
5 liability arising out of the transactions or occurrences alleged
6 in any claim or counterclaim asserted by the parties to the
7 Private Party Litigation, including Settling Defendants.

8 F. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA
9 placed the Site on the National Priorities List, set forth at 40
10 C.F.R. Part 300, Appendix B, by publication in the Federal
11 Register on March 14, 1990, 55 Fed. Reg. 9,688.

12 G. In response to a release or a substantial threat of a
13 release of hazardous substances at or from the Site, EPA
14 commenced a Remedial Investigation and Feasibility Study
15 ("RI/FS") for the Site pursuant to 40 C.F.R. § 300.430. EPA
16 completed a Remedial Investigation ("RI") Report in February
17 1994, and EPA completed a Feasibility Study ("FS") Report on July
18 5, 1994.

19 H. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA
20 published notice of the completion of the FS and of the proposed
21 plan for remedial action on July 15, 1994, in a major local
22 newspaper of general circulation. EPA provided an opportunity
23 for written and oral comments from the public on the proposed
24 plan for remedial action. A copy of the transcript of the public
25 meeting is available to the public as part of the administrative
26 record upon which the Regional Administrator based the selection
27 of the response action.

1 I. The decision by EPA on the remedial action to be
2 implemented at the Site is embodied in a Record of Decision
3 ("ROD"), executed on October 26, 1994, to which the State has
4 given its concurrence. The ROD includes a summary of responses
5 to the public comments. Notice of the final plan was published
6 in accordance with Section 117(b) of CERCLA.

7 J. Based on the information presently available to it, EPA
8 believes that the Work will be properly and promptly conducted by
9 the Settling Defendants if conducted in accordance with the
10 requirements of this Consent Decree and its appendices.

11 K. Solely for the purposes of Section 113(j) of CERCLA, the
12 remedial action selected by the ROD and the Work to be performed
13 by the Settling Defendants shall constitute a response action
14 taken or ordered by the President.

15 L. Settling Defendants currently operate a bulk marine cargo
16 terminal at the Site. Settling Defendants expect to continue to
17 operate the Site as a bulk marine cargo terminal even while the
18 response actions called for in the ROD are being implemented at
19 the Site. The Parties acknowledge that continued cooperation
20 between them is necessary to minimize the impact the response
21 actions may have on the operation of the Site as a cargo
22 terminal.

23 M. The Parties recognize, and the Court by entering this
24 Consent Decree finds, that this Consent Decree has been
25 negotiated by the Parties in good faith and implementation of
26 this Consent Decree will expedite the cleanup of the Site and
27 will avoid prolonged and complicated litigation between the
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1 Parties, and that this Consent Decree is fair, reasonable, and in
2 the public interest.

3 NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

4 II. JURISDICTION

5 1. This Court has jurisdiction over the subject matter of
6 this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C.
7 § 9606, 9607, and 9613(b), and personal jurisdiction over the
8 Settling Defendants. The Settling Defendants will not challenge
9 the terms of this Decree, the venue in this District or this
10 Court's jurisdiction to enter and enforce this Decree.

11 III. PARTIES BOUND

12 2. This Consent Decree applies to and is binding upon the
13 United States and upon Settling Defendants and their successors
14 and assigns. Any change in ownership or corporate status of a
15 Settling Defendant including, but not limited to, any transfer of
16 assets or real or personal property, shall in no way alter such
17 Settling Defendant's responsibilities under this Consent Decree.

18 3. Settling Defendants shall provide a copy of this Consent
19 Decree to each contractor hired to perform the Work (as defined
20 below) required by this Consent Decree and to each person
21 representing any Settling Defendant with respect to the Site or
22 the Work and shall condition all contracts entered into hereunder
23 upon performance of the Work in conformity with the terms of this
24 Consent Decree. Settling Defendants or their contractors shall
25 provide written notice of the Consent Decree to all
26 subcontractors hired to perform any portion of the Work required
27 by this Consent Decree. Settling Defendants shall nonetheless be
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1 responsible for ensuring that their contractors and
2 subcontractors perform the Work contemplated herein in accordance
3 with this Consent Decree. With regard to the activities
4 undertaken pursuant to this Consent Decree, each contractor and
5 subcontractor shall be deemed to be in a contractual relationship
6 with the Settling Defendants within the meaning of Section
7 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

8 IV. DEFINITIONS

9 4. Unless otherwise expressly provided herein, terms used in
10 this Consent Decree which are defined in CERCLA or in regulations
11 promulgated under CERCLA shall have the meaning assigned to them
12 in CERCLA or in such regulations. Whenever terms listed below
13 are used in this Consent Decree or in the appendices attached
14 hereto and incorporated hereunder, the following definitions
15 shall apply:

16 "CERCLA" shall mean the Comprehensive Environmental Response,
17 Compensation, and Liability Act of 1980, as amended, 42 U.S.C.
18 §§ 9601 et seq.

19 "Consent Decree" shall mean this Decree and all appendices
20 attached hereto (listed in Section XXX). In the event of
21 conflict between this Decree and any appendix, this Decree shall
22 control.

23 "Damage Assessment Costs" shall mean NOAA's and DOI's costs
24 incurred in connection with activities and studies performed to
25 determine injury to or loss of natural resources, including lost
26 interim uses, resulting from releases of hazardous substances
27 from the United Heckathorn NPL Site.

1 "Day" shall mean a calendar day unless expressly stated to be
2 a working day. "Working day" shall mean a day other than a
3 Saturday, Sunday, or Federal holiday. In computing any period of
4 time under this Consent Decree, where the last day would fall on
5 a Saturday, Sunday, or Federal holiday, the period shall run
6 until the close of business of the next working day.

7 "DOI" shall mean the United States Department of the Interior
8 and any successor departments, agencies or instrumentalities of
9 the United States.

10 "EPA" shall mean the United States Environmental Protection
11 Agency and any successor departments, agencies or
12 instrumentalities of the United States.

13 "Interest" shall mean interest at the rate specified for
14 interest on investments of the Hazardous Substance Superfund
15 established under Subchapter A of Chapter 98 of Title 26 of the
16 U.S. Code, compounded on October 1 of each year, in accordance
17 with 42 U.S.C. § 9607(a).

18 "Levin Richmond Terminal" shall mean that real property
19 described in Appendix C.

20 "National Contingency Plan" or "NCP" shall mean the National
21 Oil and Hazardous Substances Pollution Contingency Plan
22 promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605,
23 codified at 40 C.F.R. Part 300, and any amendments thereto.

24 "Natural Resource Damages" shall mean damages, including
25 Damage Assessment Costs and lost use value, recoverable under
26 Section 107 of CERCLA, 42 U.S.C. § 9607, for injury to,
27 destruction of, or loss of any and all Natural Resources at the
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1 United Heckathorn Site.

2 "Natural Resources" shall have the meaning provided in Section
3 101(16) of CERCLA, 42 U.S.C. § 9601(16).

4 "NOAA" shall mean the National Oceanic and Atmospheric
5 Administration, an agency of the United States Department of
6 Commerce, and any successor departments, agencies or
7 instrumentalities of the United States.

8 "Operation and Maintenance" or "O&M" shall mean all activities
9 required to maintain the effectiveness of the Remedial Action as
10 required under the Operation and Maintenance Plan approved or
11 developed by EPA pursuant to this Consent Decree and SOW.

12 "Paragraph" shall mean a portion of this Consent Decree
13 identified by an arabic numeral or an upper case letter.

14 "Parties" shall mean the United States and the Settling
15 Defendants.

16 "Performance Standards" shall mean placing a cap on the upland
17 area of the Site identified in Figure 6 of the ROD in accordance
18 with this Decree, the Statement of Work and the final remedial
19 design approved by EPA.

20 "Plaintiff" shall mean the United States.

21 "RCRA" shall mean the Solid Waste Disposal Act, as amended, 42
22 U.S.C. §§ 6901 et seq. (also known as the Resource Conservation
23 and Recovery Act).

24 "Record of Decision" or "ROD" shall mean the EPA Record of
25 Decision relating to the Site signed on October 26, 1994 by the
26 Regional Administrator, EPA Region IX, or her delegate, and all
27 attachments thereto. The ROD is attached as Appendix A.

1 "Remedial Action" shall mean those activities, except for
2 Operation and Maintenance, to be undertaken by the Settling
3 Defendants to implement that portion of the ROD relating to the
4 upland cap, as set forth in the SOW (see Appendix B) and the
5 final Remedial Design and Remedial Action Work Plans and other
6 plans approved by EPA.

7 "Remedial Action Work Plan" shall mean the document developed
8 pursuant to Paragraph 12 of this Consent Decree and approved by
9 EPA, and any amendments thereto.

10 "Remedial Design" shall mean those activities to be undertaken
11 by the Settling Defendants to develop the final plans and
12 specifications for the Remedial Action pursuant to the Remedial
13 Design Work Plan.

14 "Remedial Design Work Plan" shall mean the document developed
15 pursuant to Paragraph 11 of this Consent Decree and approved by
16 EPA, and any amendments thereto.

17 "Response Costs" shall mean all costs, including, but not
18 limited to, direct and indirect costs, that the United States,
19 excluding the Settling Federal Agencies, has incurred or will
20 incur in connection with the Site, including, but not limited to,
21 the cost of \$2,693,428.22 reflected in the August 30, 1994 cost
22 summary and costs incurred in performing marine monitoring for at
23 least five (5) years to determine the effectiveness of the remedy
24 selected in the ROD, reviewing or developing plans, reports and
25 other items pursuant to the Four Consent Decrees, verifying or
26 overseeing the Work or other response actions required by the
27 ROD, or otherwise implementing, overseeing, or enforcing the Four

1 Consent Decrees, including, but not limited to, payroll costs,
2 contractor costs, travel costs, laboratory costs, the costs
3 incurred pursuant to Sections VII and IX (including, but not
4 limited to, attorney's fees and any monies paid to secure access
5 and/or to secure institutional controls, including the amount of
6 just compensation).

7 "Section" shall mean a portion of this Consent Decree
8 identified by a roman numeral.

9 "Settling Defendants" shall mean Levin Enterprises, Inc. and
10 Levin Richmond Terminal, Inc..

11 "Settling Federal Agencies" shall mean the General Services
12 Administration and the Agency for International Development, and
13 any successor departments, agencies or instrumentalities of the
14 United States.

15 "Site" or the "United Heckathorn NPL Site" shall mean: the
16 northern half of the Levin Richmond Terminal property bounded by
17 the Lauritzen Channel, Cutting Boulevard, and South Fourth Street
18 in Richmond, California, depicted as a cross-hatched area in the
19 map attached as Appendix F hereto; and the Lauritzen Channel, the
20 Santa Fe Channel, the Parr Canal and the Inner Richmond Harbor
21 Channel, all as depicted in Appendix D hereto.

22 "State" shall mean the State of California.

23 "Statement of Work" or "SOW" shall mean the statement of work
24 for implementation of the Remedial Design, Remedial Action, and
25 Operation and Maintenance at the Site, as set forth in Appendix B
26 to this Consent Decree and any modifications made in accordance
27 with this Consent Decree.

1 "Supervising Contractor" shall mean the principal contractor
2 retained by the Settling Defendants to supervise and direct the
3 implementation of the Work under this Consent Decree.

4 "United States" shall mean the United States of America,
5 including its agencies, departments and instrumentalities.

6 "Waste Material" shall mean (1) any "hazardous substance"
7 under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any
8 pollutant or contaminant under Section 101(33) of CERCLA, 42
9 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27)
10 of RCRA, 42 U.S.C. § 6903(27); and (4) any "hazardous waste"
11 under 22 Cal. Code of Regulations Section 66600 et seq..

12 "Work" shall mean all activities Settling Defendants are
13 required to perform under this Consent Decree, except those
14 required by Section XXVI (Retention of Records).

15 V. GENERAL PROVISIONS

16 5. Objectives of the Parties

17 The objectives of the Parties in entering into this Consent
18 Decree are to protect public health or welfare or the environment
19 at the Site by the design and implementation of response actions
20 at the Site by the Settling Defendants; to reimburse response
21 costs of the Plaintiff; to pay Natural Resource Damages to
22 federal Trustees for natural resources; and to resolve cost
23 recovery claims, contribution claims, counterclaims or claims in
24 recoupment among the Parties.

1 6. Commitments by Settling Defendants

2 a. Settling Defendants shall finance and perform the
3 Work in accordance with this Consent Decree, the ROD, the SOW,
4 and all work plans and other plans, standards, specifications,
5 and schedules set forth herein or developed by Settling
6 Defendants and approved by EPA pursuant to this Consent Decree.
7 Settling Defendants shall also reimburse the United States,
8 excluding the Settling Federal Agencies, for response costs as
9 provided in this Consent Decree.

10 b. The obligations of Settling Defendants to finance and
11 perform the Work and to pay amounts owed the United States under
12 this Consent Decree are joint and several. In the event of the
13 insolvency or other failure of any of the Settling Defendants to
14 implement the requirements of this Consent Decree, the remaining
15 Settling Defendants shall complete all such requirements.

16 7. Compliance With Applicable Law

17 All activities undertaken by Settling Defendants pursuant to
18 this Consent Decree shall be performed in accordance with the
19 requirements of all applicable federal and state laws and
20 regulations. Settling Defendants must also comply with all
21 applicable or relevant and appropriate requirements of all
22 federal and state environmental laws as set forth in the ROD and
23 the SOW. The activities conducted pursuant to this Consent
24 Decree, if approved by EPA, shall be considered to be consistent
25 with the NCP.

26 8. Permits

27 a. As provided in Section 121(e) of CERCLA and Section
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1 300.400(e) of the NCP, no permit shall be required for any
2 portion of the Work conducted entirely on-site (i.e., within the
3 areal extent of contamination or in very close proximity to the
4 contamination and necessary for implementation of the Work).

5 Where any portion of the Work that is not on-site requires a
6 federal or state permit or approval, Settling Defendants shall
7 submit timely and complete applications and take all other
8 actions necessary to obtain all such permits or approvals.

9 b. The Settling Defendants may seek relief under the
10 provisions of Section XVIII (Force Majeure) of this Consent
11 Decree for any delay in the performance of the Work resulting
12 from a failure to obtain, or a delay in obtaining, any permit
13 required for the Work.

14 c. This Consent Decree is not, and shall not be
15 construed to be, a permit issued pursuant to any federal or state
16 statute or regulation.

17 9. Notice of Obligations to Successors-in-Title

18 a. Within fifteen (15) days after the entry of this
19 Consent Decree, the Settling Defendants shall record a notice of
20 entry of this Consent Decree with the Recorder's Office, Contra
21 Costa County, State of California. Thereafter, each deed, title,
22 or other instrument conveying an interest in the property
23 included in the Site shall contain a notice stating that the
24 property is subject to this Consent Decree and shall reference
25 the recorded location of the Consent Decree and any restrictions
26 applicable to the property under this Consent Decree.

27 b. The obligations of each Settling Defendant with
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1 respect to the provision of access and the implementation of
2 institutional controls under Section IX (Access and Institutional
3 Controls) shall be binding upon any and all such Settling
4 Defendants and any and all persons who subsequently acquire any
5 such interest or portion thereof (hereinafter "Successors-in-
6 Title"). Within fifteen (15) days after the entry of this
7 Consent Decree, each Settling Defendant shall record at the
8 Recorder's Office a notice of obligation to provide access under
9 Section IX (Access) and related covenants, if any. Each
10 subsequent instrument conveying an interest to any such property
11 included in the Site shall reference the recorded location of
12 such notice and covenants applicable to the property.

13 c. Any Settling Defendant and any Successor-in-Title
14 shall, at least thirty (30) days prior to the conveyance of any
15 such interest, give written notice of this Consent Decree to the
16 grantee and written notice to EPA of the proposed conveyance,
17 including the name and address of the grantee, and the date on
18 which notice of the Consent Decree was given to the grantee. In
19 the event of any such conveyance, the Settling Defendants'
20 obligations under this Consent Decree, including their
21 obligations to provide or secure access pursuant to Section IX,
22 shall continue to be met by the Settling Defendants. In
23 addition, if the United States approves, the grantee may perform
24 some or all of the Work under this Consent Decree. In no event
25 shall the conveyance of an interest in property that includes, or
26 is a portion of, the Site release or otherwise affect the
27 liability of the Settling Defendants to comply with the Consent
28

1 Decree.

2 VI. PERFORMANCE OF THE WORK BY SETTling DEFENDANTS

3 10. Selection of Supervising Contractor.

4 a. All aspects of the Work to be performed by Settling
5 Defendants pursuant to Sections VI (Performance of the Work by
6 Settling Defendants), VII (Remedy Review), VIII (Quality
7 Assurance, Sampling and Data Analysis), and XV (Emergency
8 Response) of this Consent Decree shall be under the direction and
9 supervision of the Supervising Contractor, the selection of which
10 shall be subject to disapproval by EPA. Within 10 days after the
11 lodging of this Consent Decree, Settling Defendants shall notify
12 EPA in writing of the name, title, and qualifications of any
13 contractor proposed to be the Supervising Contractor. EPA will
14 issue a notice of disapproval or an authorization to proceed. If
15 at any time thereafter, Settling Defendants propose to change a
16 Supervising Contractor, Settling Defendants shall give such
17 notice to EPA and must obtain an authorization to proceed from
18 EPA before the new Supervising Contractor performs, directs, or
19 supervises any Work under this Consent Decree.

20 b. If EPA disapproves a proposed Supervising Contractor,
21 EPA will notify Settling Defendants in writing. Settling
22 Defendants shall submit to EPA a list of contractors, including
23 the qualifications of each contractor, that would be acceptable
24 to them within 30 days of receipt of EPA's disapproval of the
25 contractor previously proposed. EPA will provide written notice
26 of the names of any contractors that it disapproves and an
27 authorization to proceed with respect to any of the other

1 contractors. Settling Defendants may select any contractor from
2 that list that is not disapproved and shall notify EPA of the
3 name of the contractor selected within 21 days of EPA's
4 authorization to proceed.

5 c. If EPA fails to provide written notice of its
6 authorization to proceed or disapproval as provided in this
7 Paragraph and this failure prevents the Settling Defendants from
8 meeting one or more deadlines in a plan approved by the EPA
9 pursuant to this Consent Decree, Settling Defendants may seek
10 relief under the provisions of Section XVIII (Force Majeure)
11 hereof.

12 11. Remedial Design.

13 a. Within 60 days after Settling Defendants' execution
14 of this Decree (i.e., the date when both Settling Defendants'
15 signatures are on the Decree) or 10 days after EPA's issuance of
16 an authorization to proceed pursuant to Paragraph 10, whichever
17 is later, Settling Defendants shall submit to EPA a work plan for
18 the design of the Remedial Action at the Site ("Remedial Design
19 Work Plan" or "RD Work Plan"). The Remedial Design Work Plan
20 shall provide for design of the upland capping remedy set forth
21 in the ROD, in accordance with the SOW and for achievement of the
22 Performance Standards and other requirements set forth in the
23 ROD, this Consent Decree and/or the SOW. Upon its approval by
24 EPA, the Remedial Design Work Plan shall be incorporated into and
25 become enforceable under this Consent Decree. At the same time
26 the RD Work Plan is due, the Settling Defendants shall submit to
27 EPA and the State a Health and Safety Plan for field design

1 activities which conforms to the applicable Occupational Safety
2 and Health Administration and EPA requirements including, but not
3 limited to, 29 C.F.R. § 1910.120.

4 b. The Remedial Design Work Plan shall include plans and
5 schedules for implementation of all remedial design and pre-
6 design tasks identified in the SOW. In addition, the Remedial
7 Design Work Plan shall include a schedule for completion of the
8 Remedial Action Work Plan.

9 c. Upon approval of the Remedial Design Work Plan by EPA
10 and submittal of the Health and Safety Plan for all field
11 activities to EPA and the State, Settling Defendants shall
12 implement the Remedial Design Work Plan. The Settling Defendants
13 shall submit to EPA and the State all plans, submittals and other
14 deliverables required under the approved Remedial Design Work
15 Plan in accordance with the approved schedule for review and
16 approval pursuant to Section XI (EPA Approval of Plans and Other
17 Submissions). Unless otherwise directed by EPA, Settling
18 Defendants shall not commence further Remedial Design activities
19 at the Site prior to approval of the Remedial Design Work Plan.

20 d. The preliminary design submittal shall include, at a
21 minimum, the following: (1) design criteria; (2) results of
22 additional field sampling and pre-design work; (3) project
23 delivery strategy; (4) preliminary plans, drawings and sketches;
24 (5) required specifications in outline form; and (6) preliminary
25 construction schedule.

26 e. The intermediate design submittal, if required by EPA
27 or if independently submitted by the Settling Defendants, shall

1 be a continuation and expansion of the preliminary design. Any
2 value engineering proposals must be identified and evaluated
3 during this review.

4 f. The pre-final/final design submittal shall include,
5 at a minimum, the following: (1) final plans and specifications;
6 (2) Operation and Maintenance Plan; (3) Construction Quality
7 Assurance Project Plan ("CQAPP"); (4) Field Sampling Plan
8 (directed at measuring progress towards meeting Performance
9 Standards); and (5) Contingency Plan. The CQAPP, which shall
10 detail the approach to quality assurance during construction
11 activities at the Site, shall specify a quality assurance
12 official ("QA Official"), independent of the Supervising
13 Contractor, to conduct a quality assurance program during the
14 construction phase of the project.

15 12. Remedial Action.

16 a. Within 60 days after Settling Defendants' execution
17 of this Decree (i.e., the date when both Settling Defendants'
18 signatures are on the Decree) or 10 days after EPA's issuance of
19 an authorization to proceed pursuant to Paragraph 10, whichever
20 is later, Settling Defendants shall submit to EPA and the State,
21 a work plan for the performance of the Remedial Action at the
22 Site ("Remedial Action Work Plan"). The Remedial Action Work
23 Plan shall provide for construction and implementation of the
24 remedy set forth in the ROD and achievement of the Performance
25 Standards, in accordance with this Consent Decree, the ROD, the
26 SOW, and the design plans and specifications developed in
27 accordance with the Remedial Design Work Plan and approved by
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1 EPA. Upon its approval by EPA, the Remedial Action Work Plan
2 shall be incorporated into and become enforceable under this
3 Consent Decree. At the same time as they submit the Remedial
4 Action Work Plan, Settling Defendants shall submit to EPA and the
5 State a Health and Safety Plan for field activities required by
6 the Remedial Action Work Plan which conforms to the applicable
7 Occupational Safety and Health Administration and EPA
8 requirements including, but not limited to, 29 C.F.R. § 1910.120.

9 b. The Remedial Action Work Plan shall include the
10 following: (1) the schedule for completion of the Remedial
11 Action; (2) method for selection of the contractor; (3) schedule
12 for developing and submitting other required Remedial Action
13 plans; (4) methodology for implementation of the Construction
14 Quality Assurance Plan; (5) methods for satisfying permitting
15 requirements; (6) methodology for implementation of the Operation
16 and Maintenance Plan; (7) methodology for implementation of the
17 Contingency Plan; (8) tentative formulation of the Remedial
18 Action team; (9) construction quality control plan (by
19 constructor); and (10) procedures and plans for the
20 decontamination of equipment and the disposal of contaminated
21 materials. The Remedial Action Work Plan also shall include a
22 schedule for implementation of all Remedial Action tasks
23 identified in the final design submittal and shall identify the
24 initial formulation of the Settling Defendants' Remedial Action
25 Project Team (including, but not limited to, the Supervising
26 Contractor).

27 c. Upon approval of the Remedial Action Work Plan by
28

1 EPA, Settling Defendants shall implement the activities required
2 under the Remedial Action Work Plan. The Settling Defendants
3 shall submit to EPA and the State all plans, submittals, or other
4 deliverables required under the approved Remedial Action Work
5 Plan in accordance with the approved schedule for review and
6 approval pursuant to Section XI (EPA Approval of Plans and Other
7 Submissions). Unless otherwise directed by EPA, Settling
8 Defendants shall not commence physical Remedial Action activities
9 at the Site prior to approval of the Remedial Action Work Plan.

10 13. The Settling Defendants shall continue to implement the
11 Remedial Action and O&M until the Performance Standards are
12 achieved and for so long thereafter as is otherwise required
13 under this Consent Decree.

14 14. Modification of the SOW or Related Work Plans.

15 a. If EPA determines that modification to the work
16 specified in the SOW and/or in work plans developed pursuant to
17 the SOW is necessary to carry out and maintain the effectiveness
18 of the remedy set forth in the ROD, EPA may require that such
19 modification be incorporated in the SOW and/or such work plans.
20 A modification may only be required pursuant to this Paragraph to
21 the extent that it is consistent with the scope of the remedy
22 selected in the ROD.

23 b. For the purpose of Paragraphs 14, 46 and 47 of this
24 Decree only, the "scope of the remedy selected in the ROD" is:
25 capping of areas around the former Heckathorn facility, as shown
26 in Figure 6 of the ROD, together with a deed restriction or
27 notice limiting use of the Levin Richmond Terminal to industrial
28

1 or commercial use.

2 c. If Settling Defendants object to any modification
3 determined by EPA to be necessary pursuant to this Paragraph,
4 they may seek dispute resolution pursuant to Section XIX (Dispute
5 Resolution), Paragraph 61 (record review). The SOW and/or
6 related work plans shall be modified in accordance with final
7 resolution of the dispute.

8 d. Settling Defendants shall implement any work
9 required by any modifications incorporated in the SOW and/or in
10 work plans developed pursuant to the SOW in accordance with this
11 Paragraph.

12 e. Nothing in this Paragraph shall be construed to
13 limit EPA's authority to order or require performance of further
14 response actions as otherwise provided in this Consent Decree.

15 15. Settling Defendants acknowledge and agree that nothing in
16 this Consent Decree, the SOW, or the Remedial Design or Remedial
17 Action Work Plans constitutes a warranty or representation of any
18 kind by Plaintiff that compliance with the work requirements set
19 forth in the SOW and the Work Plans will achieve the Performance
20 Standards.

21 16. Settling Defendants shall, prior to any off-Site
22 shipment of Waste Material from the Site to an out-of-state waste
23 management facility, provide written notification to the
24 appropriate state environmental official in the receiving
25 facility's state and to the EPA Project Coordinator of such
26 shipment of Waste Material. However, this notification
27 requirement shall not apply to any off-Site shipments when the
28

1 total volume of all such shipments will not exceed 10 cubic
2 yards.

3 a. The Settling Defendants shall include in the written
4 notification the following information, where available: (1) the
5 name and location of the facility to which the Waste Material are
6 to be shipped; (2) the type and quantity of the Waste Material to
7 be shipped; (3) the expected schedule for the shipment of the
8 Waste Material; and (4) the method of transportation. The
9 Settling Defendants shall notify the state in which the planned
10 receiving facility is located of major changes in the shipment
11 plan, such as a decision to ship the Waste Material to another
12 facility within the same state, or to a facility in another
13 state.

14 b. The identity of the receiving facility and state will
15 be determined by the Settling Defendants following the award of
16 the contract for Remedial Action construction. The Settling
17 Defendants shall provide the information required by Paragraph
18 16.a as soon as practicable after the award of the contract and
19 before the Waste Material is actually shipped.

20 VII. REMEDY REVIEW

21 17. Periodic Review. Settling Defendants shall conduct any
22 studies and investigations as requested by EPA, in order to
23 permit EPA to conduct reviews of whether the Remedial Action is
24 protective of human health and the environment at least every
25 five years as required by Section 121(c) of CERCLA and any
26 applicable regulations.

27 18. EPA Selection of Further Response Actions. If EPA
28

1 determines, at any time, that the remedial action selected in the
2 ROD is not protective of human health and the environment, EPA
3 may select further response actions for the Site in accordance
4 with the requirements of CERCLA and the NCP.

5 19. Opportunity To Comment. Settling Defendants and, if
6 required by Sections 113(k)(2) or 117 of CERCLA, the public, will
7 be provided with an opportunity to comment on any further
8 response actions proposed by EPA as a result of the review
9 conducted pursuant to Section 121(c) of CERCLA and to submit
10 written comments for the record during the comment period.

11 VIII. QUALITY ASSURANCE, SAMPLING, and DATA ANALYSIS

12 20. Settling Defendants shall use quality assurance, quality
13 control, and chain of custody procedures for all design,
14 compliance and monitoring samples in accordance with "EPA
15 Requirements for Quality Assurance Project Plans for
16 Environmental Data Operation," (EPA QA/R5; "Preparing Perfect
17 Project Plans," (EPA /600/9-88/087), and subsequent amendments
18 to such guidelines upon notification by EPA to Settling
19 Defendants of such amendment. Amended guidelines shall apply
20 only to procedures conducted after such notification. Prior to
21 the commencement of any monitoring project under this Consent
22 Decree, Settling Defendants shall submit to EPA for approval a
23 Quality Assurance Project Plan ("QAPP") that is consistent with
24 the SOW, the NCP and applicable guidance documents. If relevant
25 to the proceeding, the Parties agree that validated sampling data
26 generated in accordance with the QAPP(s) and reviewed and

1 approved by EPA shall be admissible as evidence, without
2 objection, in any proceeding under this Decree. Settling
3 Defendants shall ensure that EPA personnel and its authorized
4 representatives are allowed access at reasonable times to all
5 laboratories utilized by Settling Defendants in implementing this
6 Consent Decree. In addition, Settling Defendants shall ensure
7 that such laboratories shall analyze all samples submitted by EPA
8 pursuant to the QAPP for quality assurance monitoring. Settling
9 Defendants shall ensure that the laboratories they utilize for
10 the analysis of samples taken pursuant to this Decree perform all
11 analyses according to accepted EPA methods. Accepted EPA methods
12 consist of those methods which are documented in the "Contract
13 Lab Program Statement of Work for Inorganic Analysis" and the
14 "Contract Lab Program Statement of Work for Organic Analysis,"
15 dated February 1988, and any amendments made thereto during the
16 course of the implementation of this Decree. Settling Defendants
17 shall ensure that all laboratories they use for analysis of
18 samples taken pursuant to this Consent Decree participate in an
19 EPA or EPA-equivalent QA/QC program. Settling Defendants shall
20 ensure that all field methodologies utilized in collecting
21 samples for subsequent analysis pursuant to this Decree will be
22 conducted in accordance with the procedures set forth in the QAPP
23 approved by EPA.

24 21. Upon request, the Settling Defendants shall allow split
25 or duplicate samples to be taken by EPA or its authorized
26 representatives. Settling Defendants shall notify EPA not less
27 than 28 days in advance of any sample collection activity unless
28

1 shorter notice is agreed to by EPA. In addition, EPA shall have
2 the right to take any additional samples that EPA deem necessary.
3 Upon request, EPA shall allow the Settling Defendants to take
4 split or duplicate samples of any samples it takes as part of the
5 Plaintiff's oversight of the Settling Defendants' implementation
6 of the Work.

7 22. Settling Defendants shall submit to EPA a copy of the
8 results of all sampling and/or tests or other data obtained or
9 generated by or on behalf of Settling Defendants with respect to
10 the Site and/or the implementation of this Consent Decree unless
11 EPA agrees otherwise.

12 23. Notwithstanding any provision of this Consent Decree, the
13 United States hereby retains all of its information gathering and
14 inspection authorities and rights, including enforcement actions
15 related thereto, under CERCLA, RCRA and any other applicable
16 statutes or regulations.

17 IX. ACCESS AND INSTITUTIONAL CONTROLS

18 24. Beginning on February 1, 1996, Settling Defendants agree
19 to provide access at all reasonable times to the Site and, to the
20 extent access to the property is controlled by Settling
21 Defendants, any other property to which access is required for
22 the implementation of the response actions called for in the ROD.
23 Such access shall be provided to the United States and its
24 representatives (including EPA and its contractors); the
25 Supervising Contractor and its employees, agents and
26 subcontractors; and technical representatives of any potentially
27 responsible party performing response actions at the Site
28

1 pursuant to an EPA order or agreement. Access shall be for the
2 purposes of conducting any activity related to the implementation
3 of the response actions called for in the ROD, including, but not
4 limited to:

5 a. Monitoring the Work and other response actions
6 required under the ROD;

7 b. Verifying any data or information submitted to the
8 United States;

9 c. Conducting investigations relating to contamination
10 at or near the Site;

11 d. Obtaining samples;

12 e. Assessing the need for, planning, or implementing
13 additional response actions at or near the Site;

14 f. Inspecting and copying records, operating logs,
15 contracts, or other documents maintained or generated by Settling
16 Defendants or their agents, consistent with Section XXVI; and

17 g. Assessing Settling Defendants' compliance with this
18 Consent Decree or assessing other potentially responsible
19 parties' compliance with an EPA order or agreement.

20 25. To the extent that access to offsite property is required
21 for the implementation of the Work, Settling Defendants shall use
22 best efforts to secure from persons who own or control the
23 property access for Settling Defendants, as well as for the
24 United States and its representatives, including, but not limited
25 to, their contractors, as necessary to effectuate this Consent
26 Decree. For purposes of this Paragraph "best efforts" includes
27 the payment of reasonable sums of money in consideration of
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1 access. If any access required to complete the Work is not
2 obtained by February 1, 1996, Settling Defendants shall promptly
3 notify the United States in writing, and shall include in that
4 notification a summary of the steps Settling Defendants have
5 taken to attempt to obtain access. The United States may, as it
6 deems appropriate, assist Settling Defendants in obtaining
7 access. Any costs the United States incurs in obtaining access,
8 including attorney's fees, shall be considered Response Costs.

9 26. Notwithstanding any provision of this Consent Decree, the
10 United States retains all of its access authorities and rights,
11 including enforcement authorities related thereto, under CERCLA,
12 RCRA and any other applicable statute or regulations.

13 27. Settling Defendants shall record a deed restriction
14 limiting use of the Levin Richmond Terminal to the current
15 industrial classification, i.e., industrial or commercial use.
16 The restriction shall be recorded in substantially the same form
17 as Appendix G attached hereto.

18 X. REPORTING REQUIREMENTS

19 28. In addition to any other requirement of this Consent
20 Decree, Settling Defendants shall submit to EPA two (2) copies of
21 written monthly progress reports that: (a) describe the actions
22 which have been taken toward achieving compliance with this
23 Consent Decree during the previous month; (b) include a summary
24 of all results of sampling and tests and all other data received
25 or generated by Settling Defendants or their contractors or
26 agents in the previous month; (c) identify all work plans, plans
27 and other deliverables required by this Consent Decree completed

1 and submitted during the previous month; (d) describe all
2 actions, including, but not limited to, data collection and
3 implementation of work plans, which are scheduled for the next
4 six weeks and provide other information relating to the progress
5 of construction, including, but not limited to, critical path
6 diagrams, Gantt charts and Pert charts; (e) include information
7 regarding percentage of completion, unresolved delays encountered
8 or anticipated that may affect the future schedule for
9 implementation of the Work, and a description of efforts made to
10 mitigate those delays or anticipated delays; (f) include any
11 modifications to the work plans or other schedules that Settling
12 Defendants have proposed to EPA or that have been approved by
13 EPA; and (g) describe all activities undertaken in support of the
14 Community Relations Plan during the previous month and those to
15 be undertaken in the next six weeks. Settling Defendants shall
16 submit these progress reports to EPA by the tenth day of every
17 month following the lodging of this Consent Decree until EPA
18 notifies the Settling Defendants pursuant to Paragraph 47.b of
19 Section XIV (Certification of Completion). If requested by EPA,
20 Settling Defendants shall also provide briefings for EPA
21 discussing the progress of the Work.

22 29. The Settling Defendants shall notify EPA of any change in
23 the schedule described in the monthly progress report for the
24 performance of any activity, including, but not limited to, data
25 collection and implementation of work plans, no later than seven
26 days prior to the performance of the activity.

27 30. Upon the occurrence of any event during performance of
28

1 the Work that Settling Defendants are required to report pursuant
2 to Section 103 of CERCLA or Section 304 of the Emergency Planning
3 and Community Right-to-know Act (EPCRA), Settling Defendants
4 shall within 24 hours of the onset of such event orally notify
5 the EPA Project Coordinator or the Alternate EPA Project
6 Coordinator (in the event of the unavailability of the EPA
7 Project Coordinator), or, in the event that neither the EPA
8 Project Coordinator or Alternate EPA Project Coordinator is
9 available, the Emergency Response Section, Region IX, United
10 States Environmental Protection Agency. These reporting
11 requirements are in addition to the reporting required by CERCLA
12 Section 103 or EPCRA Section 304.

13 31. Within 20 days of the onset of such an event, Settling
14 Defendants shall furnish to Plaintiff a written report, signed by
15 the Settling Defendants' Project Coordinator, setting forth the
16 events which occurred and the measures taken, and to be taken, in
17 response thereto. Within 30 days of the conclusion of such an
18 event, Settling Defendants shall submit a report setting forth
19 all actions taken in response thereto.

20 32. Settling Defendants shall submit two (2) copies of all
21 plans, reports, and data required by the SOW, the Remedial Design
22 Work Plan, the Remedial Action Work Plan, or any other approved
23 plans to EPA in accordance with the schedules set forth in such
24 plans. Settling Defendants shall simultaneously submit two (2)
25 copies of all such plans, reports and data to the State.

26 33. All reports and other documents submitted by Settling
27 Defendants to EPA (other than the monthly progress reports
28

1 referred to above) which purport to document Settling Defendants'
2 compliance with the terms of this Consent Decree shall be signed
3 by an authorized representative of the Settling Defendants.

4 XI. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

5 34. After review of any plan, report or other item which is
6 required to be submitted for approval pursuant to this Consent
7 Decree, EPA shall: (a) approve, in whole or in part, the
8 submission; (b) approve the submission upon specified conditions;
9 (c) modify the submission to cure the deficiencies; (d)
10 disapprove, in whole or in part, the submission, directing that
11 the Settling Defendants modify the submission; or (e) any
12 combination of the above. However, EPA shall not modify a
13 submission without first providing Settling Defendants at least
14 one notice of deficiency and an opportunity to cure within seven
15 (7) days, except where to do so would cause serious disruption to
16 the Work or where previous submissions have been disapproved due
17 to material defects and the deficiencies in the submission under
18 consideration indicate a bad faith lack of effort to submit an
19 acceptable deliverable.

20 35. In the event of approval, approval upon conditions, or
21 modification by EPA, pursuant to Paragraph 34(a), (b), or (c),
22 Settling Defendants shall proceed to take any action required by
23 the plan, report, or other item, as approved or modified by EPA
24 subject only to their right to invoke the Dispute Resolution
25 procedures set forth in Section XIX (Dispute Resolution) with
26 respect to the modifications or conditions made by EPA. In the
27 event that EPA modifies the submission to cure the deficiencies

1 pursuant to Paragraph 34(c) and the submission has a material
2 defect, EPA retains its right to seek stipulated penalties, as
3 provided in Section XX (Stipulated Penalties).

4 36. a. Upon receipt of a notice of disapproval pursuant to
5 Paragraph 34(d), Settling Defendants shall, within 14 days or
6 such longer time as specified by EPA in such notice, correct the
7 deficiencies and resubmit the plan, report, or other item for
8 approval. Any stipulated penalties applicable to the submission,
9 as provided in Section XX, shall accrue during the 7-day period
10 or otherwise specified period but shall not be payable unless the
11 resubmission is disapproved or modified due to a material defect
12 as provided in Paragraphs 37 and 38.

13 b. Notwithstanding the receipt of a notice of disapproval
14 pursuant to Paragraph 34(d), Settling Defendants shall proceed,
15 at the direction of EPA, to take any action required by any non-
16 deficient portion of the submission. Implementation of any non-
17 deficient portion of a submission shall not relieve Settling
18 Defendants of any liability for stipulated penalties under
19 Section XX (Stipulated Penalties).

20 37. In the event that a resubmitted plan, report or other
21 item, or portion thereof, is disapproved by EPA, EPA may again
22 require the Settling Defendants to correct the deficiencies, in
23 accordance with the preceding Paragraphs. EPA also retains the
24 right to modify or develop the plan, report or other item.
25 Settling Defendants shall implement any such plan, report, or
26 item as modified or developed by EPA, subject only to their right
27 to invoke the procedures set forth in Section XIX (Dispute
28

1 Resolution).

2 38. If upon resubmission, a plan, report, or item is
3 disapproved or modified by EPA due to a material defect, Settling
4 Defendants shall be deemed to have failed to submit such plan,
5 report, or item timely and adequately unless the Settling
6 Defendants invoke the dispute resolution procedures set forth in
7 Section XIX (Dispute Resolution) and EPA's action is overturned
8 pursuant to that Section. The provisions of Section XIX (Dispute
9 Resolution) and Section XX (Stipulated Penalties) shall govern
10 the implementation of the Work and accrual and payment of any
11 stipulated penalties during Dispute Resolution. If EPA's
12 disapproval or modification is upheld, stipulated penalties shall
13 accrue for such violation from the date on which the initial
14 submission was originally required, as provided in Section XX.

15 39. All plans, reports, and other items required to be
16 submitted to EPA under this Consent Decree shall, upon approval
17 or modification by EPA, be enforceable under this Consent Decree.
18 In the event EPA approves or modifies a portion of a plan,
19 report, or other item required to be submitted to EPA under this
20 Consent Decree, the approved or modified portion shall be
21 enforceable under this Consent Decree.

22 XII. PROJECT COORDINATORS

23 40. The designated Project Coordinators and Alternate Project
24 Coordinators are as follows:

1 For EPA:

2 Andrew Lincoff
3 EPA Region 9
4 75 Hawthorne Street
5 San Francisco, CA 94105

6 For Settling Defendants:

7 Mike McCoy
8 Levin Richmond Terminal
9 402 Wright Ave.
10 Richmond, CA 94804
11 (510) 232-4422

12 If a Project Coordinator or Alternate Project Coordinator
13 initially designated is changed, the identity of the successor
14 will be given to the other Parties at least 5 working days before
15 the changes occur, unless impracticable, but in no event later
16 than the actual day the change is made. The Settling Defendants'
17 Project Coordinator shall be subject to disapproval by EPA and
18 shall have the technical expertise sufficient to adequately
19 oversee all aspects of the Work. The Settling Defendants'
20 Project Coordinator shall not be an attorney for any of the
21 Settling Defendants in this matter. He or she may assign other
22 representatives, including other contractors, to serve as a Site
23 representative for oversight of performance of daily operations
24 during remedial activities.

25 41. EPA may designate other representatives, including, but
26 not limited to, EPA employees, and federal contractors and
27 consultants, to observe and monitor the progress of any activity
28 undertaken pursuant to this Consent Decree. EPA's Project
Coordinator and Alternate Project Coordinator shall have the
authority lawfully vested in a Remedial Project Manager ("RPM")

1 and an On-Scene Coordinator ("OSC") by the National Contingency
2 Plan, 40 C.F.R. Part 300. In addition, EPA's Project Coordinator
3 or Alternate Project Coordinator shall have authority, consistent
4 with the National Contingency Plan, to halt any Work required by
5 this Consent Decree and to take any necessary response action
6 when s/he determines that conditions at the Site constitute an
7 emergency situation or may present an immediate threat to public
8 health or welfare or the environment due to release or threatened
9 release of Waste Material.

10 XIII. ASSURANCE OF ABILITY TO COMPLETE WORK

11 42. Prior to beginning the Work, Settling Defendants shall
12 establish and maintain financial security in the amount of \$1
13 million in one or more of the following forms:

14 (a) A surety bond guaranteeing performance of the Work;

15 (b) One or more irrevocable letters of credit equalling
16 the total estimated cost of the Work;

17 (c) A trust fund;

18 (d) A guarantee to perform the Work by one or more parent
19 corporations or subsidiaries, or by one or more unrelated
20 corporations that have a substantial business relationship with
21 at least one of the Settling Defendants;

22 (e) A demonstration that one or more of the Settling
23 Defendants satisfy the requirements of 40 C.F.R. § 264.143(f); or

24 (f) A demonstration through providing internal and/or
25 public financial information sufficient to satisfy EPA that
26 Settling Defendants have sufficient assets to make other
27 assurances unnecessary. Updates of such financial information
28

1 shall be submitted to EPA on a semi-annual basis.

2 43. If the Settling Defendants seek to demonstrate the
3 ability to complete the Work through a guarantee by a third party
4 pursuant to Paragraph 42(d) of this Consent Decree, Settling
5 Defendants shall demonstrate that the guarantor satisfies the
6 requirements of 40 C.F.R. § 264.143(f). If Settling Defendants
7 seek to demonstrate their ability to complete the Work by means
8 of the financial test or the corporate guarantee pursuant to
9 Paragraph 42(d) or (e), they shall resubmit sworn statements
10 conveying the information required by 40 C.F.R. § 264.143(f)
11 annually, on the anniversary of the effective date of this
12 Consent Decree. In the event that EPA determines at any time
13 that the financial assurances provided pursuant to this Section
14 are inadequate, Settling Defendants shall, within 30 days of
15 receipt of notice of EPA's determination, obtain and present to
16 EPA for approval one of the other forms of financial assurance
17 listed in Paragraph 42 of this Consent Decree. Settling
18 Defendants' inability to demonstrate financial ability to
19 complete the Work shall not excuse performance of any activities
20 required under this Consent Decree.

21 44. If Settling Defendants can show that the estimated cost
22 to complete the remaining Work has diminished below the amount
23 set forth in Paragraph 42 above after entry of this Consent
24 Decree, Settling Defendants may, on any anniversary date of entry
25 of this Consent Decree, or at any other time agreed to by the
26 Parties, reduce the amount of the financial security provided
27 under this Section to the estimated cost of the remaining work to

1 be performed. Settling Defendants shall submit a proposal for
2 such reduction to EPA, in accordance with the requirements of
3 this Section, and may reduce the amount of the security upon
4 approval by EPA. In the event of a dispute, Settling Defendants
5 may reduce the amount of the security in accordance with the
6 final administrative or judicial decision resolving the dispute.

7 45. Settling Defendants may change the form of financial
8 assurance provided under this Section at any time, upon notice to
9 and approval by EPA, provided that the new form of assurance
10 meets the requirements of this Section. In the event of a
11 dispute, Settling Defendants may change the form of the financial
12 assurance only in accordance with the final administrative or
13 judicial decision resolving the dispute.

14 XIV. CERTIFICATION OF COMPLETION

15 46. Completion of the Remedial Action

16 a. Within 90 days after Settling Defendants conclude
17 that the Remedial Action has been fully performed and the
18 Performance Standards have been attained, Settling Defendants
19 shall schedule and conduct a pre-certification inspection to be
20 attended by Settling Defendants and EPA. If, after the pre-
21 certification inspection, the Settling Defendants still believe
22 that the Remedial Action has been fully performed and the
23 Performance Standards have been attained, they shall submit a
24 written report requesting certification to EPA for approval, with
25 a copy to the State, pursuant to Section XI (EPA Approval of
26 Plans and Other Submissions) within 30 days of the inspection.
27 In the report, a registered professional engineer and the
28

1 Settling Defendants' Project Coordinator shall state that the
2 Remedial Action has been completed in full satisfaction of the
3 requirements of this Consent Decree. The written report shall
4 include as-built drawings signed and stamped by a professional
5 engineer. The report shall contain the following statement,
6 signed by a responsible corporate official of a Settling
7 Defendant or the Settling Defendants' Project Coordinator:

8 "To the best of my knowledge, after thorough investigation, I
9 certify that the information contained in or accompanying this
10 submission is true, accurate and complete. I am aware that there
11 are significant penalties for submitting false information,
12 including the possibility of fine and imprisonment for knowing
13 violations."

14 If, after completion of the pre-certification inspection and
15 receipt and review of the written report, EPA determines that the
16 Remedial Action or any portion thereof has not been completed in
17 accordance with this Consent Decree or that the Performance
18 Standards have not been achieved, EPA will notify Settling
19 Defendants in writing of the activities that must be undertaken
20 by Settling Defendants pursuant to this Consent Decree to
21 complete the Remedial Action and achieve the Performance
22 Standards. EPA may only require Settling Defendants to perform
23 such activities pursuant to this Paragraph to the extent that
24 such activities are consistent with the "scope of the remedy
25 selected in the ROD," as that term is defined in Paragraph 14.b.
26 EPA will set forth in the notice a schedule for performance of
27 such activities consistent with the Consent Decree and the SOW or
28 require the Settling Defendants to submit a schedule to EPA for
approval pursuant to Section XI (EPA Approval of Plans and Other

1 Submissions). Settling Defendants shall perform all activities
2 described in the notice in accordance with the specifications and
3 schedules established pursuant to this Paragraph, subject to
4 their right to invoke the dispute resolution procedures set forth
5 in Section XIX (Dispute Resolution).

6 b. If EPA concludes, based on the initial or any
7 subsequent report requesting Certification of Completion, that
8 the Remedial Action has been performed in accordance with this
9 Consent Decree and that the Performance Standards have been
10 achieved, EPA will so certify in writing to Settling Defendants.
11 This certification shall constitute the Certification of
12 Completion of the Remedial Action for purposes of this Consent
13 Decree, including, but not limited to, Section XXII (Covenants
14 Not to Sue by Plaintiff). Certification of Completion of the
15 Remedial Action shall not affect Settling Defendants' obligations
16 under this Consent Decree.

17 47. Completion of the Work

18 a. Within 90 days after Settling Defendants conclude
19 that all phases of the Work (including O&M), have been fully
20 performed, Settling Defendants shall schedule and conduct a pre-
21 certification inspection to be attended by Settling Defendants
22 and EPA. If, after the pre-certification inspection, the
23 Settling Defendants still believe that the Work has been fully
24 performed, Settling Defendants shall submit a written report by a
25 registered professional engineer stating that the Work has been
26 completed in full satisfaction of the requirements of this
27 Consent Decree. The report shall contain the following

1 statement, signed by a responsible corporate official of a
2 Settling Defendant or the Settling Defendants' Project
3 Coordinator:

4 "To the best of my knowledge, after thorough investigation,
5 I certify that the information contained in or accompanying
6 this submission is true, accurate and complete. I am aware
7 that there are significant penalties for submitting false
8 information, including the possibility of fine and
9 imprisonment for knowing violations."

10 If, after review of the written report, EPA determines that any
11 portion of the Work has not been completed in accordance with
12 this Consent Decree, EPA will notify Settling Defendants in
13 writing of the activities that must be undertaken by Settling
14 Defendants pursuant to this Consent Decree to complete the Work.
15 EPA may only require Settling Defendants to perform such
16 activities pursuant to this Paragraph to the extent that such
17 activities are consistent with the "scope of the remedy selected
18 in the ROD," as that term is defined in Paragraph 14.b. EPA
19 will set forth in the notice a schedule for performance of such
20 activities consistent with the Consent Decree and the SOW or
21 require the Settling Defendants to submit a schedule to EPA for
22 approval pursuant to Section XI (EPA Approval of Plans and Other
23 Submissions). Settling Defendants shall perform all activities
24 described in the notice in accordance with the specifications and
25 schedules established therein, subject to their right to invoke
26 the dispute resolution procedures set forth in Section XIX
27 (Dispute Resolution).

28 b. If EPA concludes, based on the initial or any
subsequent request for Certification of Completion by Settling

1 Defendants, that the Work has been performed in accordance with
2 this Consent Decree, EPA will so notify the Settling Defendants
3 in writing.

4 XV. EMERGENCY RESPONSE

5 48. In the event of any action or occurrence during the
6 performance of the Work which causes or threatens a release of
7 Waste Material from the Site that constitutes an emergency
8 situation or may present an immediate threat to public health or
9 welfare or the environment, Settling Defendants shall, subject to
10 Paragraph 49, immediately take all appropriate action to prevent,
11 abate, or minimize such release or threat of release, and shall
12 immediately notify the EPA's Project Coordinator, or, if the
13 Project Coordinator is unavailable, EPA's Alternate Project
14 Coordinator. If neither of these persons is available, the
15 Settling Defendants shall notify the EPA Emergency Response Unit,
16 Region IX. Settling Defendants shall take such actions in
17 consultation with EPA's Project Coordinator or other available
18 authorized EPA officer and in accordance with all applicable
19 provisions of the Health and Safety Plans, the Contingency Plans,
20 and any other applicable plans or documents developed pursuant to
21 the SOW. In the event that Settling Defendants fail to take
22 appropriate response action as required by this Section, and EPA
23 takes such action instead, Settling Defendants shall reimburse
24 EPA all costs of the response action not inconsistent with the
25 NCP.

26 49. Nothing in the preceding Paragraph, Paragraph 14 or in
27 this Consent Decree shall be deemed to limit any authority of the

1 United States (a) to take all appropriate action to protect human
2 health and the environment or to prevent, abate, respond to, or
3 minimize an actual or threatened release of Waste Material on,
4 at, or from the Site, or (b) to direct or order such action, or
5 seek an order from the Court, to protect human health and the
6 environment or to prevent, abate, respond to, or minimize an
7 actual or threatened release of Waste Material on, at, or from
8 the Site, subject to Section XXII (Covenants Not to Sue by
9 Plaintiff).

10 XVI. REIMBURSEMENT OF RESPONSE COSTS

11 50. Within 10 days after entry of this Decree, Settling
12 Defendants shall pay to the EPA Hazardous Substance Superfund
13 \$100,000, in reimbursement of Response Costs, by FedWire
14 Electronic Funds Transfer to the U.S. Department of Justice
15 account in accordance with current electronic funds transfer
16 procedures, referencing U.S.A.O. file number 9600022, EPA Region
17 9 and Site/Spill ID #09R3, and DOJ case number 90-11-3-598.
18 Payment shall be made in accordance with instructions provided to
19 the Settling Defendants by the Financial Litigation Unit of the
20 United States Attorney's Office for the Northern District of
21 California, following lodging of this Decree. Settling
22 Defendants shall send notice that such payment has been made to
23 the United States as specified in Section XXVII (Notice and
24 Submissions) and to David Wood, Chief, Cost Accounting, EPA
25 Region 9, 75 Hawthorne Street, San Francisco, CA 94105.

26 XVII. INDEMNIFICATION AND INSURANCE

27 51. a. The United States does not assume any liability by
28

1 entering into this agreement or by virtue of any designation of
2 Settling Defendants as EPA's authorized representatives under
3 Section 104(e) of CERCLA. Settling Defendants shall indemnify,
4 save and hold harmless the United States and its officials,
5 agents, employees, contractors, subcontractors, or
6 representatives for or from any and all claims or causes of
7 action arising from, or on account of, negligent or other
8 wrongful acts or omissions of Settling Defendants, their
9 officers, directors, employees, agents, contractors,
10 subcontractors, and any persons acting on their behalf or under
11 their control, in carrying out activities pursuant to this
12 Consent Decree, including, but not limited to, any claims arising
13 from any designation of Settling Defendants as EPA's authorized
14 representatives under Section 104(e) of CERCLA. Further, the
15 Settling Defendants agree to pay the United States all costs it
16 incurs including, but not limited to, attorney's fees and other
17 expenses of litigation and settlement arising from, or on account
18 of, claims made against the United States based on negligent or
19 other wrongful acts or omissions of Settling Defendants, their
20 officers, directors, employees, agents, contractors,
21 subcontractors, and any persons acting on their behalf or under
22 their control, in carrying out activities pursuant to this
23 Consent Decree. The United States shall not be held out as a
24 party to any contract entered into by or on behalf of Settling
25 Defendants in carrying out activities pursuant to this Consent
26 Decree. Neither the Settling Defendants nor any such contractor
27 shall be considered an agent of the United States.

1 b. The United States shall give Settling Defendants
2 notice of any claim for which the United States plans to seek
3 indemnification pursuant to Paragraph 51.a., and shall consult
4 with Settling Defendants prior to settling such claim.

5 52. Settling Defendants waive all claims against the United
6 States for damages or reimbursement or for set-off of any
7 payments made or to be made to the United States arising from or
8 on account of any contract, agreement, or arrangement between any
9 one or more of Settling Defendants and any person for performance
10 of Work on or relating to the Site, including, but not limited
11 to, claims on account of construction delays. In addition,
12 Settling Defendants shall indemnify and hold harmless the United
13 States with respect to any and all claims for damages or
14 reimbursement arising from or on account of any contract,
15 agreement, or arrangement between any one or more of Settling
16 Defendants and any person for performance of Work on or relating
17 to the Site, including, but not limited to, claims on account of
18 construction delays.

19 53. No later than 15 days before commencing any on-site Work,
20 Settling Defendants shall secure, and shall maintain until the
21 first anniversary of EPA's Certification of Completion of the
22 Remedial Action pursuant to Paragraph 46.b. of Section XIV
23 (Certification of Completion) comprehensive general liability
24 insurance with limits of \$5 million dollars, combined single
25 limit, and automobile liability insurance with limits of \$1
26 million dollars, combined single limit, naming the United States
27 as an additional insured. In addition, for the duration of this
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1 Consent Decree, Settling Defendants shall satisfy, or shall
2 ensure that their contractors or subcontractors satisfy, all
3 applicable laws and regulations regarding the provision of
4 worker's compensation insurance for all persons performing the
5 Work on behalf of Settling Defendants in furtherance of this
6 Consent Decree. Prior to commencement of the Work under this
7 Consent Decree, Settling Defendants shall provide to EPA
8 certificates of such insurance and a copy of each insurance
9 policy. Settling Defendants shall resubmit such certificates and
10 copies of policies each year on the anniversary of the effective
11 date of this Consent Decree. If Settling Defendants demonstrate
12 by evidence satisfactory to EPA that any contractor or
13 subcontractor maintains insurance equivalent to that described
14 above, or insurance covering the same risks but in a lesser
15 amount, then, with respect to that contractor or subcontractor,
16 Settling Defendants need provide only that portion of the
17 insurance described above which is not maintained by the
18 contractor or subcontractor.

19 XVIII. FORCE MAJEURE

20 54. "Force majeure," for purposes of this Consent Decree, is
21 defined as any event arising from causes beyond the control of
22 the Settling Defendants, of any entity controlled by Settling
23 Defendants, or of Settling Defendants' contractors, that delays
24 or prevents the performance of any obligation under this Consent
25 Decree despite Settling Defendants' best efforts to fulfill the
26 obligation. The requirement that the Settling Defendants
27 exercise "best efforts to fulfill the obligation" includes using
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1 best efforts to anticipate any potential force majeure event and
2 best efforts to address the effects of any potential force
3 majeure event (1) as it is occurring and (2) following the
4 potential force majeure event, such that the delay is minimized
5 to the greatest extent possible. "Force Majeure" does not
6 include financial inability to complete the Work or a failure to
7 attain the Performance Standards.

8 55. If any event occurs or has occurred that may delay the
9 performance of any obligation under this Consent Decree, whether
10 or not caused by a force majeure event, the Settling Defendants
11 shall notify orally EPA's Project Coordinator or, in his or her
12 absence, EPA's Alternate Project Coordinator or, in the event
13 both of EPA's designated representatives are unavailable, the
14 Director of the Hazardous Waste Management Division, EPA Region
15 IX, within three (3) days of when Settling Defendants first knew
16 that the event might cause a delay. Within ten (10) days
17 thereafter, Settling Defendants shall provide in writing to EPA
18 an explanation and description of the reasons for the delay; the
19 anticipated duration of the delay; all actions taken or to be
20 taken to prevent or minimize the delay; a schedule for
21 implementation of any measures to be taken to prevent or mitigate
22 the delay or the effect of the delay; the Settling Defendants'
23 rationale for attributing such delay to a force majeure event if
24 they intend to assert such a claim; and a statement as to
25 whether, in the opinion of the Settling Defendants, such event
26 may cause or contribute to an endangerment to public health,
27 welfare or the environment. The Settling Defendants shall

1 include with any notice all available documentation supporting
2 their claim that the delay was attributable to a force majeure.
3 Failure to comply with the above requirements shall preclude
4 Settling Defendants from asserting any claim of force majeure for
5 that event for the period of time of such failure to comply, and
6 for any additional delay caused by such failure. Settling
7 Defendants shall be deemed to know of any circumstance of which
8 Settling Defendants, any entity controlled by Settling
9 Defendants, or Settling Defendants' contractors knew or should
10 have known.

11 56. If EPA agrees that the delay or anticipated delay is
12 attributable to a force majeure event, the time for performance
13 of the obligations under this Consent Decree that are affected by
14 the force majeure event will be extended by EPA for such time as
15 is necessary to complete those obligations. An extension of the
16 time for performance of the obligations affected by the force
17 majeure event shall not, of itself, extend the time for
18 performance of any other obligation. If EPA does not agree that
19 the delay or anticipated delay has been or will be caused by a
20 force majeure event, EPA will notify the Settling Defendants in
21 writing of its decision. If EPA agrees that the delay is
22 attributable to a force majeure event, EPA will notify the
23 Settling Defendants in writing of the length of the extension, if
24 any, for performance of the obligations affected by the force
25 majeure event.

26 57. If the Settling Defendants elect to invoke the dispute
27 resolution procedures set forth in Section XIX (Dispute
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1 Resolution), they shall do so no later than 15 days after receipt
2 of EPA's notice. In any such proceeding, Settling Defendants
3 shall have the burden of demonstrating by a preponderance of the
4 evidence that the delay or anticipated delay has been or will be
5 caused by a force majeure event, that the duration of the delay
6 or the extension sought was or will be warranted under the
7 circumstances, that best efforts were exercised to avoid and
8 mitigate the effects of the delay, and that Settling Defendants
9 complied with the requirements of Paragraphs 54 and 55, above.
10 If Settling Defendants carry this burden, the delay at issue
11 shall be deemed not to be a violation by Settling Defendants of
12 the affected obligation of this Consent Decree identified to EPA
13 and the Court.

14 XIX. DISPUTE RESOLUTION

15 58. Unless otherwise expressly provided for in this Consent
16 Decree, the dispute resolution procedures of this Section shall
17 be the exclusive mechanism to resolve disputes arising under or
18 with respect to this Consent Decree. However, the procedures set
19 forth in this Section shall not apply to actions by the United
20 States to enforce obligations of the Settling Defendants that
21 have not been disputed in accordance with this Section.

22 59. Any dispute which arises under or with respect to this
23 Consent Decree shall in the first instance be the subject of
24 informal negotiations between the parties to the dispute. The
25 period for informal negotiations shall not exceed 20 days from
26 the time the dispute arises, unless it is modified by written
27 agreement of the parties to the dispute. The dispute shall be

1 considered to have arisen when one party sends the other parties
2 a written Notice of Dispute.

3 60. a. In the event that the parties cannot resolve a
4 dispute by informal negotiations, including mediation, under
5 Paragraph 59, then the position advanced by EPA shall be
6 considered binding unless, within seven (7) days after the
7 conclusion of the informal negotiation period, Settling
8 Defendants invoke the formal dispute resolution procedures of
9 this Section by serving on the United States a written Statement
10 of Position on the matter in dispute, including, but not limited
11 to, any factual data, analysis or opinion supporting that
12 position and any supporting documentation relied upon by the
13 Settling Defendants. The Statement of Position shall specify the
14 Settling Defendants' position as to whether formal dispute
15 resolution should proceed under Paragraph 61 or Paragraph 62.

16 b. Within seven (7) days after receipt of Settling
17 Defendants' Statement of Position, EPA will serve on Settling
18 Defendants its Statement of Position, including, but not limited
19 to, any factual data, analysis, or opinion supporting that
20 position and all supporting documentation relied upon by EPA.
21 EPA's Statement of Position shall include a statement as to
22 whether formal dispute resolution should proceed under Paragraph
23 61 or 62. Within five (5) days after receipt of EPA's Statement
24 of Position, Settling Defendants may submit a Reply.

25 c. If there is disagreement between EPA and the Settling
26 Defendants as to whether dispute resolution should proceed under
27 Paragraph 61 or 62, the parties to the dispute shall follow the
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1 procedures set forth in the paragraph determined by EPA to be
2 applicable. However, if the Settling Defendants ultimately
3 appeal to the Court to resolve the dispute, the Court shall
4 determine which paragraph is applicable in accordance with the
5 standards of applicability set forth in Paragraphs 61 and 62.

6 61. Formal dispute resolution for disputes pertaining to the
7 selection or adequacy of any response action and all other
8 disputes that are accorded review on the administrative record
9 under applicable principles of administrative law shall be
10 conducted pursuant to the procedures set forth in this Paragraph.
11 For purposes of this Paragraph, the adequacy of any response
12 action includes, without limitation: (1) the adequacy or
13 appropriateness of plans, procedures to implement plans, or any
14 other items requiring approval by EPA under this Consent Decree;
15 and (2) the adequacy of the performance of response actions taken
16 pursuant to this Consent Decree. Nothing in this Consent Decree
17 shall be construed to allow any dispute by Settling Defendants
18 regarding the validity of the ROD's provisions.

19 a. An administrative record of the dispute shall be
20 maintained by EPA and shall contain all statements of position,
21 including supporting documentation, submitted pursuant to this
22 Section. Where appropriate, EPA may allow submission of
23 supplemental statements of position by the parties to the
24 dispute.

25 b. The Director of the Waste Management Division, EPA
26 Region IX, will issue a final administrative decision resolving
27 the dispute based on the administrative record described in
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1 Paragraph 61.a. This decision shall be binding upon the Settling
2 Defendants, subject only to the right to seek judicial review
3 pursuant to Paragraph 61.c. and d.

4 c. Any administrative decision made by EPA pursuant to
5 Paragraph 61.b. shall be reviewable by this Court, provided that
6 a motion for judicial review of the decision is filed by the
7 Settling Defendants with the Court and served on all Parties
8 within 10 days of receipt of EPA's decision. The motion shall
9 include a description of the matter in dispute, the efforts made
10 by the parties to resolve it, the relief requested, and the
11 schedule, if any, within which the dispute must be resolved to
12 ensure orderly implementation of this Consent Decree. The United
13 States may file a response to Settling Defendants' motion.

14 d. In proceedings on any dispute governed by this
15 Paragraph, Settling Defendants shall have the burden of
16 demonstrating that the decision of the Waste Management Division
17 Director is arbitrary and capricious or otherwise not in
18 accordance with law. Judicial review of EPA's decision shall be
19 on the administrative record compiled pursuant to Paragraph 61.a.

20 62. Formal dispute resolution for disputes that neither
21 pertain to the selection or adequacy of any response action nor
22 are otherwise accorded review on the administrative record under
23 applicable principles of administrative law, shall be governed by
24 this Paragraph.

25 a. Following receipt of Settling Defendants' Statement
26 of Position submitted pursuant to Paragraph 65, the Director of
27 the Waste Management Division, EPA Region IX, will issue a final

1 decision resolving the dispute. The Waste Management Division
2 Director's decision shall be binding on the Settling Defendants
3 unless, within 10 days of receipt of the decision, the Settling
4 Defendants file with the Court and serve on the parties a motion
5 for judicial review of the decision setting forth the matter in
6 dispute, the efforts made by the parties to resolve it, the
7 relief requested, and the schedule, if any, within which the
8 dispute must be resolved to ensure orderly implementation of the
9 Consent Decree. The United States may file a response to
10 Settling Defendants' motion.

11 b. Notwithstanding Paragraph K of Section I
12 (Background) of this Consent Decree, judicial review of any
13 dispute governed by this Paragraph shall be governed by
14 applicable principles of law.

15 63. The invocation of formal dispute resolution procedures
16 under this Section shall not extend, postpone or affect in any
17 way any obligation of the Settling Defendants under this Consent
18 Decree, not directly in dispute, unless EPA or the Court agrees
19 otherwise. Stipulated penalties with respect to the disputed
20 matter shall continue to accrue but payment shall be stayed
21 pending resolution of the dispute as provided in Paragraph 72.
22 Notwithstanding the stay of payment, stipulated penalties shall
23 accrue from the first day of noncompliance with any applicable
24 provision of this Consent Decree. In the event that the Settling
25 Defendants do not prevail on the disputed issue, stipulated
26 penalties shall be assessed and paid as provided in Section XX
27 (Stipulated Penalties).

1 XX. STIPULATED PENALTIES

2 64. Settling Defendants shall be liable for stipulated
3 penalties in the amounts set forth in Paragraphs 65 and 66 to the
4 United States for failure to comply with the requirements of this
5 Consent Decree specified below, unless excused under Section
6 XVIII (Force Majeure). "Compliance" by Settling Defendants shall
7 include completion of the activities under this Consent Decree or
8 any work plan or other plan approved under this Consent Decree
9 identified below in accordance with all applicable requirements
10 of law, this Consent Decree, the SOW, and any plans or other
11 documents approved by EPA pursuant to this Consent Decree and
12 within the specified time schedules established by and approved
13 under this Consent Decree.

14 65. a. The following stipulated penalties shall accrue per
15 violation per day for any noncompliance identified in
16 Subparagraph b:

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$ 1,000	1-7 days
\$ 5,000	8-14 days
\$ 7,500	15-21 days
\$10,000	22-28 days
\$20,000	29-35 days
\$25,000	36 days and beyond

22 b. Settling Defendants' failure to:

23 (1) make the payment required in Paragraph 50;

24 (2) complete the Work as set out in this Decree and the
25 SOW;

26 (3) correct deficiencies and resubmit plans as specified
27 in Paragraph 36;

1 (4) obtain insurance as specified in Paragraph 53; or

2 (5) maintain the upland cap in accordance with the
3 Operations and Maintenance Manual.

4 66. The following stipulated penalties shall accrue per
5 violation per day for failure to submit timely or adequate
6 reports or other written documents pursuant to Paragraphs
7 28, 30, 31:

8	<u>Penalty Per Violation</u>	<u>Period of Noncompliance</u>
9	<u>Per Day</u>	
10	\$ 100	1-7 days
11	\$ 500	8-14 days
	\$ 750	15-21 days
	\$1,000	22 days and beyond

12 67. In the event that EPA assumes performance of a portion or
13 all of the Work pursuant to Paragraph 84 of Section XXII
14 (Covenants Not to Sue by Plaintiff), Settling Defendants shall be
15 liable for a stipulated penalty in the amount of \$50,000.00.

16 68. All penalties shall begin to accrue on the day after the
17 complete performance is due or the day a violation occurs, and
18 shall continue to accrue through the final day of the correction
19 of the noncompliance or completion of the activity. However,
20 stipulated penalties shall not accrue: (1) with respect to a
21 deficient submission under Section XI (EPA Approval of Plans and
22 Other Submissions), during the period, if any, beginning on the
23 31st day after EPA's receipt of such submission until the date
24 that EPA notifies Settling Defendants of any deficiency; (2) with
25 respect to a decision by the Director of the Waste Management
26 Division, EPA Region IX, under Paragraph 61.b. or 62.a. of
27 Section XIX (Dispute Resolution), during the period, if any,

1 beginning on the 21st day after the date that Settling
2 Defendants' reply to EPA's Statement of Position is received
3 until the date that the Director issues a final decision
4 regarding such dispute; or (3) with respect to judicial review by
5 this Court of any dispute under Section XIX (Dispute Resolution),
6 during the period, if any, beginning on the 31st day after the
7 Court's receipt of the final submission regarding the dispute
8 until the date that the Court issues a final decision regarding
9 such dispute. Nothing herein shall prevent the simultaneous
10 accrual of separate penalties for separate violations of this
11 Consent Decree.

12 69. Following EPA's determination that Settling Defendants
13 have failed to comply with a requirement of this Consent Decree,
14 EPA may give Settling Defendants written notification of the same
15 and describe the noncompliance. EPA may send the Settling
16 Defendants a written demand for the payment of the penalties.
17 However, penalties shall accrue as provided in the preceding
18 Paragraph regardless of whether EPA has notified the Settling
19 Defendants of a violation.

20 70. All penalties accruing under this Section shall be due
21 and payable to the United States within 30 days of the Settling
22 Defendants' receipt from EPA of a demand for payment of the
23 penalties, unless Settling Defendants invoke the Dispute
24 Resolution procedures under Section XIX (Dispute Resolution).
25 All payments to the United States under this Section shall be
26 paid by certified or cashier's check(s) made payable to "EPA
27 Hazardous Substance Superfund;" shall be mailed to U.S. EPA,
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1 Region IX, Attention: Superfund Accounting, P.O. Box 360863M,
2 Pittsburgh, PA 15251; shall indicate that the payment is for
3 stipulated penalties; and shall reference the EPA Region and
4 Site/Spill ID #09R3, the DOJ Case Number 90-11-3-598, and the
5 name and address of the party making payment. Copies of check(s)
6 paid pursuant to this Section, and any accompanying transmittal
7 letter(s), shall be sent to the United States as provided in
8 Section XXVII (Notices and Submissions).

9 71. The payment of penalties shall not alter in any way
10 Settling Defendants' obligation to complete the performance of
11 the Work required under this Consent Decree.

12 72. Penalties shall continue to accrue as provided in
13 Paragraph 68 during any dispute resolution period, but need not
14 be paid until the following:

15 a. If the dispute is resolved by agreement or by a
16 decision of EPA that is not appealed to this Court, accrued
17 penalties determined to be owing shall be paid to EPA within 15
18 days of the agreement or the receipt of EPA's decision or order;

19 b. If the dispute is appealed to this Court and the
20 United States prevails in whole or in part, Settling Defendants
21 shall pay all accrued penalties determined by the Court to be
22 owed to EPA within 60 days of receipt of the Court's decision or
23 order, except as provided in Subparagraph c below;

24 c. If the District Court's decision is appealed by any
25 Party, Settling Defendants shall pay all accrued penalties
26 determined by the District Court to be owing to the United States
27 into an interest-bearing escrow account within 60 days of receipt
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1 of the Court's decision or order. Penalties shall be paid into
2 this account as they continue to accrue, at least every 60 days.
3 Within 15 days of receipt of the final appellate court decision,
4 the escrow agent shall pay the balance of the account to EPA or
5 to Settling Defendants to the extent that they prevail.

6 73. a. If Settling Defendants fail to pay stipulated
7 penalties when due, the United States may institute proceedings
8 to collect the penalties, as well as interest. Settling
9 Defendants shall pay Interest on the unpaid balance, which shall
10 begin to accrue on the date of demand made pursuant to Paragraph
11 70.

12 b. Nothing in this Consent Decree shall be construed as
13 prohibiting, altering, or in any way limiting the ability of the
14 United States to seek any other remedies or sanctions available
15 by virtue of Settling Defendants' violation of this Decree or of
16 the statutes and regulations upon which it is based, including,
17 but not limited to, penalties pursuant to Section 122(1) of
18 CERCLA. Provided, however, that the United States shall not seek
19 civil penalties pursuant to Section 122(1) of CERCLA for any
20 violation for which a stipulated penalty is provided herein,
21 except in the case of a willful violation of the Consent Decree.

22 74. Notwithstanding any other provision of this Section, the
23 United States may, in its unreviewable discretion, waive any
24 portion of stipulated penalties that have accrued pursuant to
25 this Consent Decree.

1 XXI. PAYMENT OF NATURAL RESOURCE DAMAGES

2 75. Within 10 days after entry of this Decree, Settling
3 Defendants shall pay \$19,464.72 to the United States. The
4 allocation to Settling Defendants of \$19,464.72, out of the
5 United States' total Natural Resource Damages recovery of
6 \$400,000 from defendants which are parties to the Four Decrees,
7 was determined solely by potentially responsible parties,
8 including Settling Defendants. Payment shall be made by check,
9 made payable to the Secretary of the Interior and delivered to
10 Chief, Division of Finance Division, United States Fish and
11 Wildlife Service, 4401 North Fairfax Drive, Room 380, Arlington,
12 VA, 22203 (phone (703) 358-1742). The check shall reflect that
13 it is a payment to the "Natural Resource Damage Assessment and
14 Restoration Fund, Account No. 14X5198" and reference the "Levin
15 Richmond/United Heckathorn Site." DOI will assign these funds a
16 special project number to allow the funds to be maintained as a
17 segregated account within the DOI Natural Resource Damage
18 Assessment and Restoration Fund, Account No. 14X5198 ("Trustees
19 Account"). DOI shall, in accordance with law, manage and invest
20 funds in the Trustees Account and segregate in the Account any
21 return on investments or interest accrued for use by the natural
22 resource Trustees. DOI shall not make any charge against the
23 Account for any investment or management services provided. DOI
24 shall hold all funds in the Account, including return on
25 investments or accrued interest, subject to the provisions of
26 this Decree and any agreement DOI and NOAA may reach regarding
27 the use of the funds.

1 76. If Settling Defendants do not timely pay the amount
2 specified in Paragraph 75, this Consent Decree shall be
3 considered an enforceable judgment, under Federal Rules of Civil
4 Procedure 69 and other applicable statutory authority, for
5 purposes of post-judgment collection of the amount due the
6 Trustees, without further order of this Court. Interest shall be
7 assessed at the annual rate established pursuant to 31 U.S.C.
8 § 3717 on the overdue amount from the due date set forth in
9 Paragraph 75 through the date of payment. In addition, in the
10 event the United States takes action to enforce the judgment,
11 Settling Defendants shall reimburse the United States for costs
12 and reasonable attorney's fees incurred in enforcing Settling
13 Defendants' obligation.

1 XXII. COVENANTS NOT TO SUE BY PLAINTIFF

2 77. In consideration of the actions that will be performed
3 and the payments that will be made by the Settling Defendants
4 under the terms of this Decree and except as specifically
5 provided in Paragraphs 78-83 of this Section, the United States
6 hereby covenants not to sue or take administrative action against
7 any of the Settling Defendants, and the Settling Defendants' past
8 and present officers, directors and employees acting in such
9 respective capacities for Settling Defendants, pursuant to
10 Sections 106, 107(a) and (f), and 113(f) of CERCLA, 42 U.S.C. §§
11 9606, 9607(a) and (f), 9613(f), at the Site. Except with respect
12 to future liability, these covenants not to sue shall take effect
13 upon the receipt by the United States of the payments required by
14 Paragraphs 50 of Section XVI (Reimbursement of Response Costs)
15 and Paragraph 75 of Section XXI (Payment of Natural Resource
16 Damages). With respect to future liability, these covenants not
17 to sue shall take effect upon Certification of Completion of
18 Remedial Action by EPA pursuant to Paragraph 46.b of Section XIV
19 (Certification of Completion). These covenants not to sue are
20 conditioned upon the satisfactory performance by Settling
21 Defendants of their obligations under this Consent Decree. These
22 covenants not to sue extend only to the Settling Defendants, and
23 the Settling Defendants' past and present officers, directors and
24 employees acting in such respective capacities for the Settling
25 Defendants, and do not extend to any other person.

26 78. United States' Pre-certification reservations.

27 Notwithstanding any other provision of this Consent Decree, the
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1 United States reserves, and this Consent Decree is without
2 prejudice to, the right to institute proceedings in this action
3 or in a new action, or to issue an administrative order seeking
4 to compel Settling Defendants (1) to perform further response
5 actions relating to the Site, or (2) to reimburse the United
6 States for additional costs of response if, prior to
7 Certification of Completion of the Remedial Action:

8 (i) conditions at the Site, previously unknown to EPA,
9 are discovered, or

10 (ii) information, previously unknown to EPA, is received,
11 in whole or in part,

12 and these previously unknown conditions or information together
13 with any other relevant information indicates that the remedial
14 action(s) selected in the ROD are not protective of human health
15 or the environment.

16 79. United States' Post-certification reservations.

17 Notwithstanding any other provision of this Consent Decree, the
18 United States reserves, and this Consent Decree is without
19 prejudice to, the right to institute proceedings in this action
20 or in a new action, or to issue an administrative order seeking
21 to compel Settling Defendants (1) to perform further response
22 actions relating to the Site, or (2) to reimburse the United
23 States for additional costs of response if, subsequent to
24 Certification of Completion of the Remedial Action:

25 (i) conditions at the Site, previously unknown to EPA,
26 are discovered, or

27 (ii) information, previously unknown to EPA, is received,
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1 in whole or in part,
2 and these previously unknown conditions or this information
3 together with other relevant information indicate that the
4 remedial action(s) selected in the ROD are not protective of
5 human health or the environment.

6 80. For purposes of Paragraph 78, the information and the
7 conditions known to EPA shall include only that information and
8 those conditions known to EPA as of the date the ROD was signed
9 and set forth in the ROD for the Site and the administrative
10 record supporting the ROD. For purposes of Paragraph 79, the
11 information and the conditions known to EPA shall include only
12 that information and those conditions known to EPA as of the date
13 of Certification of Completion of the Remedial Action and set
14 forth in the Record of Decision, the administrative record
15 supporting the Record of Decision, the post-ROD administrative
16 record, or in any information received by EPA pursuant to the
17 requirements of this Consent Decree prior to Certification of
18 Completion of the Remedial Action.

19 81. Reservation by the Natural Resource Trustees for Unknown
20 Conditions and New Information. Notwithstanding any other
21 provision of this Decree, the United States, on behalf of its
22 natural resource Trustees, reserves, and this Decree is without
23 prejudice to, the right to bring an action against any Settling
24 Defendant in this action or in a new action to seek recovery of
25 Natural Resource Damages, based on (i) conditions with respect to
26 the Site unknown to the Trustees as of the date this Decree is
27 lodged with the court, that result in or contribute to injury to,
28

1 | destruction of or loss of natural resources; or (ii) information
2 | received by the Trustees after the date the Decree is lodged with
3 | the court which indicates that there is injury to, destruction
4 | of, or loss of natural resources of a type unknown, or a
5 | magnitude greater than was known, to the Trustees.

6 | 82. Notwithstanding any other provision of this Decree, the
7 | United States reserves, and this Decree is without prejudice to,
8 | the right to institute proceedings in this action or in a new
9 | action, or to issue an administrative order, seeking to compel
10 | Settling Defendants to perform further response actions relating
11 | to the Site or to reimburse the United States for response costs
12 | incurred after the effective date of this Decree, if EPA
13 | determines, through an amendment to the ROD, that the remedial
14 | actions selected in the ROD are not protective of human health
15 | and the environment and EPA selects further response actions at
16 | the Site.

17 | 83. General Reservation of Rights. The covenants not to sue
18 | set forth above do not pertain to any matters other than those
19 | expressly specified in Paragraph 77. The United States reserves,
20 | and this Consent Decree is without prejudice to, all rights
21 | against Settling Defendants with respect to all other matters,
22 | including but not limited to, the following:

23 | (1) claims based on a failure by Settling Defendants to
24 | meet a requirement of this Consent Decree;

25 | (2) liability arising from the past, present, or future
26 | disposal, release, or threat of release of Waste

1 Materials outside of the Site, including liability for
2 damages for injury to, destruction of, or loss of natural
3 resources, and for the costs of any natural resource
4 damage assessments;

5 (3) liability for future disposal of Waste Material at
6 the Site, other than as provided in the ROD, the Work, or
7 otherwise ordered by EPA;

8 (4) criminal liability; and

9 (5) liability for violations of federal or state law
10 which occur during or after implementation of the
11 Remedial Action.

12 84. Work Takeover In the event EPA determines that Settling
13 Defendants have ceased implementation of any portion of the Work,
14 are seriously or repeatedly deficient or late in their
15 performance of the Work, or are implementing the Work in a manner
16 which may cause an endangerment to human health or the
17 environment, EPA may assume the performance of all or any
18 portions of the Work as EPA determines necessary. Settling
19 Defendants may invoke the procedures set forth in Section XIX
20 (Dispute Resolution), Paragraph 61, to dispute EPA's
21 determination that takeover of the Work is warranted under this
22 Paragraph. Costs incurred by the United States in performing the
23 Work pursuant to this Paragraph shall be considered response
24 costs, and Settling Defendants shall reimburse EPA all costs of
25 the response action not inconsistent with the NCP.

26 85. Notwithstanding any other provision of this Consent
27 Decree, the United States retains all authority and reserves all

1 rights to take any and all response actions authorized by law.

2 XXIII. COVENANTS BY SETTLING DEFENDANTS

3 86. Covenant Not to Sue. Subject to the reservations in
4 Paragraph 87 and below, Settling Defendants hereby covenant not
5 to sue and agree not to assert any claims or causes of action
6 against the United States with respect to the Site or this
7 Consent Decree, including, but not limited to:

8 a. any direct or indirect claim for reimbursement from
9 the Hazardous Substance Superfund (established pursuant to the
10 Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections
11 106(b)(2), 107, 111, 112, 113 or any other provision of law;

12 b. any claims against the United States, including any
13 department, agency or instrumentality of the United States under
14 CERCLA Sections 107 or 113 related to the Site, or

15 c. any claims arising out of response activities at the
16 Site, including claims based on EPA's selection of response
17 actions, oversight of response activities or approval of plans
18 for such activities.

19 The Settling Defendants reserve the right to assert any
20 counterclaims against the United States arising out of any action
21 filed by the United States pursuant to Paragraphs 78, 79, 81, 82
22 or 83(3).

23 87. The Settling Defendants reserve, and this Consent Decree
24 is without prejudice to, claims against the United States,
25 subject to the provisions of Chapter 171 of Title 28 of the
26 United States Code, for money damages for injury or loss of
27 property or personal injury or death caused by the negligent or
28

1 wrongful act or omission of any employee of the United States
2 while acting within the scope of his office or employment under
3 circumstances where the United States, if a private person, would
4 be liable to the claimant in accordance with the law of the place
5 where the act or omission occurred. However, any such claim
6 shall not include a claim for any damages caused, in whole or in
7 part, by the act or omission of any person, including any
8 contractor, who is not a federal employee as that term is defined
9 in 28 U.S.C. § 2671; nor shall any such claim include a claim
10 based on EPA's selection of response actions, or the oversight or
11 approval of the Settling Defendants' plans or activities. The
12 foregoing applies only to claims which are brought pursuant to
13 any statute other than CERCLA and for which the waiver of
14 sovereign immunity is found in a statute other than CERCLA.

15 88. Nothing in this Consent Decree shall be deemed to
16 constitute preauthorization of a claim within the meaning of
17 Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R.
18 § 300.700(d).

19 89. The Settling Defendants agree that in this action or in
20 an new action or proceeding seeking to recover the United States'
21 response costs, or to compel Settling Defendants to undertake a
22 response action, or to recover Natural Resource Damages incurred
23 for releases of hazardous substances at the Site, the United
24 States may, at its option, use any depositions taken in the
25 Private Party Litigation for any purpose as though the court had
26 found that the conditions set forth in Fed. R. Civ. P. 32(a)(3)
27 are satisfied and as though the deponent were then present and
28

1 | testifying.

2 | XXIV. EFFECT OF SETTLEMENT; CONTRIBUTION PROTECTION

3 | 90. Nothing in this Consent Decree shall be construed to
4 | create any rights in, or grant any cause of action to, any person
5 | not a Party to this Consent Decree. The preceding sentence shall
6 | not be construed to waive or nullify any rights that any person
7 | not a signatory to this decree may have under applicable law.
8 | Each of the Parties expressly reserves any and all rights
9 | (including, but not limited to, any right to contribution),
10 | defenses, claims, demands, and causes of action which each Party
11 | may have with respect to any matter, transaction, or occurrence
12 | relating in any way to the Site against any person not a Party
13 | hereto.

14 | 91. The Parties agree, and by entering this Consent Decree
15 | this Court finds, that the Settling Defendants and Settling
16 | Federal Agencies are entitled, as of the effective date of this
17 | Consent Decree, to protection from contribution actions or claims
18 | as provided by CERCLA Section 113(f)(2), 42 U.S.C. § 9613(f)(2)
19 | for matters addressed in this Consent Decree. "Matters addressed
20 | in this Decree" shall mean Natural Resource Damages and all
21 | response costs incurred or to be incurred by the United States or
22 | any other person or entity at the Site, but do not include
23 | natural resource damages and response costs incurred or to be
24 | incurred in connection with the presence, release or threatened
25 | release of a hazardous substance outside the Site.

26 | 92. The Settling Defendants agree that with respect to any
27 | suit or claim for contribution brought by them for matters
28 |

1 related to this Consent Decree they will notify the United States
2 in writing no later than 60 days prior to the initiation of such
3 suit or claim.

4 93. The Settling Defendants also agree that with respect to
5 any suit or claim for contribution brought against them for
6 matters related to this Consent Decree they will notify in
7 writing the United States within 10 days of service of the
8 complaint on them. In addition, Settling Defendants shall notify
9 the United States within 10 days of service or receipt of any
10 Motion for Summary Judgment and within 10 days of receipt of any
11 order from a court setting a case for trial.

12 94. In any subsequent administrative or judicial proceeding
13 initiated by the United States for injunctive relief, recovery of
14 response costs, or other appropriate relief relating to the Site,
15 Settling Defendants shall not assert, and may not maintain, any
16 defense or claim based upon the principles of waiver, res
17 judicata, collateral estoppel, issue preclusion, claim-splitting,
18 or other defenses based upon any contention that the claims
19 raised by the United States in the subsequent proceeding were or
20 should have been brought in the instant case; provided, however,
21 that nothing in this Paragraph affects the enforceability of the
22 covenants not to sue set forth in Section XXII (Covenants Not to
23 Sue by Plaintiff).

24 XXV. ACCESS TO INFORMATION

25 95. Settling Defendants shall provide to EPA, upon request,
26 copies of all documents and information within their possession

1 or control or that of their contractors or agents relating to
2 activities at the Site or to the implementation of this Consent
3 Decree, including, but not limited to, sampling, analysis, chain
4 of custody records, manifests, trucking logs, receipts, reports,
5 sample traffic routing, correspondence, or other documents or
6 information related to the Work. Settling Defendants shall also
7 make available to EPA, for purposes of investigation, information
8 gathering, or testimony, their employees, agents, or
9 representatives with knowledge of relevant facts concerning the
10 performance of the Work.

11 96. a. Settling Defendants may assert business
12 confidentiality claims covering part or all of the documents or
13 information submitted to Plaintiff under this Consent Decree to
14 the extent permitted by and in accordance with Section 104(e)(7)
15 of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b).
16 Documents or information determined to be confidential by EPA
17 will be afforded the protection specified in 40 C.F.R. Part 2,
18 Subpart B. If no claim of confidentiality accompanies documents
19 or information when they are submitted to EPA, or if EPA has
20 notified Settling Defendants that the documents or information
21 are not confidential under the standards of Section 104(e)(7) of
22 CERCLA, the public may be given access to such documents or
23 information without further notice to Settling Defendants.

24 b. The Settling Defendants may assert that certain documents,
25 records and other information are privileged under the attorney-
26 client privilege or any other privilege recognized by federal
27 law. If the Settling Defendants assert such a privilege in lieu
28

1 of providing documents, they shall provide the Plaintiff with the
2 following: (1) the title of the document, record, or
3 information; (2) the date of the document, record, or
4 information; (3) the name and title of the author of the
5 document, record, or information; (4) the name and title of each
6 addressee and recipient; (5) a description of the contents of the
7 document, record, or information: and (6) the privilege asserted
8 by Settling Defendants. However, no documents, reports or other
9 information created or generated pursuant to the requirements of
10 the Consent Decree shall be withheld on the grounds that they are
11 privileged.

12 97. No claim of confidentiality shall be made with respect to
13 any data, including, but not limited to, all sampling,
14 analytical, monitoring, hydrogeologic, scientific, chemical, or
15 engineering data, or any other documents or information
16 evidencing conditions at or around the Site.

17 XXVI. RETENTION OF RECORDS

18 98. Except as specifically provided in Paragraph 101, until
19 10 years after the Settling Defendants' receipt of EPA's
20 notification pursuant to Paragraph 47.b of Section XIV
21 (Certification of Completion of the Work), each Settling
22 Defendant shall preserve and retain all records and documents now
23 in its possession or control or which come into its possession or
24 control that relate in any manner to the performance of the Work
25 or liability of any person for response actions conducted and to
26 be conducted at the Site, regardless of any corporate retention
27 policy to the contrary. Until 10 years after the Settling
28

1 Defendants' receipt of EPA's notification pursuant to Paragraph
2 47.b of Section XIV (Certification of Completion), Settling
3 Defendants shall also instruct their contractors and agents to
4 preserve all documents, records, and information of whatever
5 kind, nature or description relating to the performance of the
6 Work.

7 99. At the conclusion of this document retention period, or
8 at any earlier date, Settling Defendants shall notify the United
9 States at least 90 days prior to the destruction of any such
10 records or documents, and, upon request by the United States
11 Settling Defendants shall deliver any such records or documents
12 to EPA. Settling Defendants shall be relieved of the
13 preservation and retention obligation 180 days after giving such
14 notice as to the specific records or documents described in the
15 notice. The Settling Defendants may assert that certain
16 documents, records and other information are privileged under the
17 attorney-client privilege or any other privilege recognized by
18 federal law. If the Settling Defendants assert such a privilege,
19 they shall provide the Plaintiffs with the following: (1) the
20 title of the document, record, or information; (2) the date of
21 the document, record, or information; (3) the name and title of
22 the author of the document, record, or information; (4) the name
23 and title of each addressee and recipient; (5) a description of
24 the subject of the document, record, or information; and (6) the
25 privilege asserted by Settling Defendants. However, no
26 documents, reports or other information created or generated
27 pursuant to the requirements of the Consent Decree shall be
28

1 withheld on the grounds that they are privileged.

2 100. Each Settling Defendant hereby certifies individually
3 that, to the best of its knowledge and belief, after thorough
4 inquiry, it has not altered, mutilated, discarded, destroyed or
5 otherwise disposed of any records, documents or other information
6 relating to its potential liability regarding the Site since
7 notification of potential liability by the United States or the
8 State or the filing of suit against it regarding the Site and
9 that it has fully complied with any and all EPA requests for
10 information pursuant to Sections 104(e) and 122(e) of CERCLA, 42
11 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42
12 U.S.C. § 6927.

13 XXVII. NOTICES AND SUBMISSIONS

14 101. Whenever, under the terms of this Consent Decree,
15 written notice is required to be given or a report or other
16 document is required to be sent by one Party to another, it shall
17 be directed to the individuals at the addresses specified below,
18 unless those individuals or their successors give notice of a
19 change to the other Parties in writing. All notices and
20 submissions shall be considered effective upon receipt, unless
21 otherwise provided. Written notice as specified herein shall
22 constitute complete satisfaction of any written notice
23 requirement of the Consent Decree with respect to the United
24 States, EPA and the Settling Defendants, respectively.

1 As to the United States:

2 Chief, Environmental Enforcement Section
3 Environment and Natural Resources Division
4 U.S. Department of Justice
5 P.O. Box 7611
6 Ben Franklin Station
7 Washington, D.C. 20044
8 Re: DJ # 90-11-3-598

9 and

10 Director, Waste Management Division
11 United States Environmental Protection Agency
12 Region IX
13 75 Hawthorne Street
14 San Francisco, CA 94105

15 As to EPA:

16 Andrew Lincoff
17 EPA Project Coordinator
18 United States Environmental Protection Agency
19 Region IX
20 75 Hawthorne Street
21 San Francisco, CA 94105

22 As to the Settling Defendants:

23 Mike McCoy
24 Settling Defendants' Project Coordinator
25 Levin Richmond Terminal
26 402 Wright Ave.
27 Richmond, CA 94804

28 XXVIII. EFFECTIVE DATE

102. The effective date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court, except as otherwise provided herein.

XXIX. RETENTION OF JURISDICTION

103. This Court retains jurisdiction over both the subject matter of this Consent Decree and the Settling Defendants for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling any of the Parties to

1 apply to the Court at any time for such further order, direction,
2 and relief as may be necessary or appropriate for the
3 construction or modification of this Consent Decree, or to
4 effectuate or enforce compliance with its terms, or to resolve
5 disputes in accordance with Section XIX (Dispute Resolution)
6 hereof.

7 XXX. APPENDICES

8 104. The following appendices are attached to and
9 incorporated into this Consent Decree:

10 "Appendix A" is the ROD.

11 "Appendix B" is the SOW.

12 "Appendix C" is the description of the Levin Richmond
13 Terminal.

14 "Appendix D" is the description and/or map of the marine
15 portion of the Site.

16 "Appendix E" is a form of the deed restriction.

17 "Appendix F" is a map of the land portion of the Site.

18 XXXI. COMMUNITY RELATIONS

19 105. Settling Defendants shall propose to EPA their
20 participation in the community relations plan to be developed by
21 EPA. EPA will determine the appropriate role for the Settling
22 Defendants under the Plan. Settling Defendants shall also
23 cooperate with EPA in providing information regarding the Work to
24 the public. As requested by EPA, Settling Defendants shall
25 participate in the preparation of such information for
26 dissemination to the public and in public meetings which may be
27 held or sponsored by EPA to explain activities at or relating to

1 the Site.

2 XXXII. MODIFICATION

3 106. Schedules specified in this Consent Decree for
4 completion of the Work may be modified by agreement of EPA and
5 the Settling Defendants. All such modifications shall be made in
6 writing.

7 107. Except as provided in Paragraph 14 ("Modification of the
8 SOW or related Work Plans"), no material modifications shall be
9 made to the SOW without written notification to and written
10 approval of the United States, Settling Defendants, and the
11 Court. Prior to providing its approval to any modification, the
12 United States will provide the State with a reasonable
13 opportunity to review and comment on the proposed modification.
14 Modifications to the SOW that do not materially alter that
15 document may be made by written agreement between EPA, after
16 providing the State with a reasonable opportunity to review and
17 comment on the proposed modification, and the Settling
18 Defendants.

19 108. Nothing in this Decree shall be deemed to alter the
20 Court's power to enforce, supervise or approve modifications to
21 this Consent Decree.

22 XXXIII. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

23 109. This Consent Decree shall be lodged with the Court for a
24 period of not less than thirty (30) days for public notice and
25 comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C.
26 § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves
27 the right to withdraw or withhold its consent if the comments
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1 regarding the Consent Decree disclose facts or considerations
2 which indicate that the Consent Decree is inappropriate,
3 improper, or inadequate. Settling Defendants consent to the
4 entry of this Consent Decree without further notice. If for any
5 reason the Court should decline to approve this Consent Decree in
6 the form presented, this agreement is voidable at the sole
7 discretion of any Party and the terms of the agreement may not be
8 used as evidence in any litigation between the Parties.

9 XXXIV. SIGNATORIES/SERVICE

10 110. Each undersigned representative of a Settling Defendant
11 to this Consent Decree and the Assistant Attorney General for
12 Environment and Natural Resources of the Department of Justice
13 certifies that he or she is fully authorized to enter into the
14 terms and conditions of this Consent Decree and to execute and
15 legally bind such Party to this document.

16 111. Each Settling Defendant hereby agrees not to oppose
17 entry of this Consent Decree by this Court or to challenge any
18 provision of this Consent Decree unless the United States has
19 notified the Settling Defendants in writing that it no longer
20 supports entry of the Consent Decree.

21 112. Each Settling Defendant shall identify, on the attached
22 signature page, the name, address and telephone number of an
23 agent who is authorized to accept service of process by mail on
24 behalf of that Party with respect to all matters arising under or
25 relating to this Consent Decree. Settling Defendants hereby
26 agree to accept service in that manner and to waive the formal
27 service requirements set forth in Rule 4 of the Federal Rules of
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1 Civil Procedure and any applicable local rules of this Court,
2 including, but not limited to, service of a summons.

3 SO ORDERED THIS _____ DAY OF _____, 19__.

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5 United States District Judge
6 CLAUDIA WILKEN
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1 THE UNDERSIGNED PARTIES enter into this Consent Decree in the
2 matter of United States v. Montrose Chemical Corporation of
California, relating to the United Heckathorn Superfund Site.

3 FOR THE UNITED STATES OF AMERICA

4
5 Date: June 7, 1996

Lois J. Schiffer
6 LOIS J. SCHIFFER
7 Assistant Attorney General
8 Environment and Natural Resources
9 Division
U.S. Department of Justice

10 Date: _____

Helen H. Kang
11 HELEN H. KANG
12 Environmental Enforcement Section
13 Environment and Natural Resources
14 Division

15 Date: _____

S. Randall Humm
16 S. RANDALL HUMM
17 Environment & Natural Resources
18 Division
19 P.O. Box 23986
Washington, D.C. 20026-3986
(202) 514-3097

20 Date: _____

Michael J. Yamaguchi
21 MICHAEL J. YAMAGUCHI
22 United States Attorney
Northern District of California
23 PATRICK BUPARA
Assistant United States Attorney

1 THE UNDERSIGNED PARTIES enter into this Consent Decree in the
2 matter of United States v. Montrose Chemical Corporation of
3 California, relating to the United Heckathorn Superfund Site.

4 FOR THE UNITED STATES OF AMERICA

5 Date: _____

6 LOIS J. SCHIFFER
7 Assistant Attorney General
8 Environment and Natural Resources
9 Division
10 U.S. Department of Justice

11 Date: June 3, 1996

12 HELEN H. KANG
13 HELEN H. KANG
14 Environmental Enforcement Section
15 Environment and Natural Resources
16 Division

17 Date: June 3, 1996

18 S. RANDALL HUMM
19 S. RANDALL HUMM
20 Environment & Natural Resources
21 Division
22 P.O. Box 23986
23 Washington, D.C. 20026-3986
24 (202) 514-3097

25 Date: 5-29-96

26 MICHAEL J. YAMAGUCHI
27 MICHAEL J. YAMAGUCHI
28 United States Attorney
Northern District of California
PATRICK BUPARA
Assistant United States Attorney

1 THE UNDERSIGNED PARTIES enter into this Consent Decree in the
2 matter of United States v. Montrose Chemical Corporation of
California, related to the United Heckathorn Superfund Site.

3 FOR THE UNITED STATES OF AMERICA

4
5 Date: 6-6-96

Keith Takata
6 KEITH TAKATA
7 Director
8 Hazardous Waste Management Division
9 Region 9
U.S. Environmental Protection
Agency

10 Date: June 6, 1996

John J. Lyons
11 JOHN J. LYONS
12 Assistant Regional Counsel
13 U.S. Environmental Protection Agency
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1 THE UNDERSIGNED PARTIES enter into this Consent Decree in the
2 matter of United States v. Montrose Chemical Corporation of
California, related to the United Heckathorn Superfund Site.

3 FOR SETTLING DEFENDANTS

4 LEVIN ENTERPRISES, INC.

5
6 Date: MAY 8, 1996

W.S. Benak, PRESIDENT
7 [NAME, TITLE] WILLIAM S. BENAK

8 LEVIN RICHMOND TERMINAL, INC.

9
10 Date: MAY 8, 1996

W.S. Benak, PRESIDENT
11 [NAME, TITLE]

RECORD OF DECISION

**United Heckathorn Superfund Site
Richmond, California**

EPA ID# CAD981436363

PART I - DECLARATION

Statement of Basis and Purpose

This Record of Decision ("ROD") presents the selected remedial action for the United Heckathorn Superfund Site ("the Site") in Richmond, California. This document was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, ("CERCLA"), as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), 42 U.S.C. §§9601 et seq., and, to the extent practicable, in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300, and the laws of the State of California. This decision is based on the Administrative Record for the Site. The administrative record index identifies the documents upon which the selection of the remedial action is based.

Assessment of the Site

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Remedy

The United Heckathorn Superfund Site in Richmond, California, was used to formulate pesticides from approximately 1947 to 1966. Soils at the Site and sediments in Richmond Harbor were contaminated with various chlorinated pesticides, primarily DDT, as a result of these pesticide formulation activities. At the time of Site listing in 1990, a visible deposit of pesticide residue containing up to 100% DDT was present on the Lauritzen Channel embankment. Several response actions have already been taken to cleanup the most contaminated upland areas of the Site, including the embankment. Under EPA Removal Order 90-22, a group of Potentially Responsible Parties (PRPs) excavated the embankment deposit and transported it offsite to a permitted disposal facility. During subsequent actions through 1993 pursuant to the removal order, all known additional upland soil deposits containing high levels of pesticides were removed, as were piles of contaminated soils generated in earlier actions.

The final remedy addresses remaining hazardous substances, primarily in the marine environment. The major components of the selected remedy include:

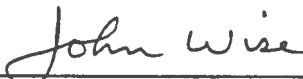
- Dredging of all soft bay mud from the Lauritzen Channel and Parr Canal, with offsite disposal of dredged material.
- Placement of clean material after dredging.
- Construction of a cap around the former Heckathorn facility to prevent erosion.
- A deed restriction limiting use of the property at the former Heckathorn facility location to

- non-residential uses.
Marine monitoring to verify the effectiveness of the remedy.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate ("ARARs") to the remedial action, and is cost effective. The selected remedy uses engineering controls and institutional controls to address remaining hazardous substances at the Site. Concentrated wastes at the upland portion of the Site were addressed by previous removal actions.

Because this remedy will result in hazardous substances remaining onsite, a review will be conducted within five years after the commencement of remedial action, and every five years thereafter, to ensure that the remedy continues to provide adequate protection of human health and the environment.



Felicia Marcus *fa*
Regional Administrator

10.26.94

Date

PART II - DECISION SUMMARY

United Heckathorn Superfund Site Richmond, California

1. Site Name, Location, and Description.

The United Heckathorn Site is located in Richmond Harbor, on the east side of San Francisco Bay (Figures 1 and 2) in Contra Costa County, California. The location of the former United Heckathorn facility (Figure 3) is currently being used as a marine shipping terminal operated by the Levin Richmond Terminal Corporation (LRTC). The area of contamination at the Site includes the northern five acres of the terminal and marine sediments in harbor channels including the Lauritzen, which is immediately adjacent to the location of the former Heckathorn facility, the Santa Fe, the Parr Canal, and the Inner Harbor Channel.

The upland area of the Site is currently fenced and occupied. Current and expected future zoning of the upland area of the Site permits only industrial use. Land use restrictions selected as part of the Site remedy will also permit only nonresidential, industrial or commercial uses in the future.

2. Site History and Enforcement Activities.

The upland area of the Site is currently owned by Levin Enterprises, Inc. The Site was used from approximately 1947 to 1966 by several operators, including the R.J. Prentiss Company, Heckathorn and Company, United Heckathorn, United Chemetrics, and Chemwest Incorporated (hereafter collectively referred to as "United Heckathorn") to formulate and package pesticides. No chemicals were manufactured onsite.

Documents from the 1950s and 1960s indicate that approximately 95% of Heckathorn's operations entailed processing the pesticide, DDT. The processing activities included mixing, blending, grinding, and packaging. Various solvents, including xylenes, were used to dissolve DDT and other pesticides into liquid formulations. Powder formulations were also prepared.

United Heckathorn employees apparently routinely washed out equipment containing pesticide residues. The wash water was permitted to either run through drains that discharged to the Lauritzen Channel, or to seep into the ground adjacent to the Site (Levine-Fricke, 1990). Later, settling tanks were used to recover pesticide residues from wash water; however, overflow and leakage from these tanks also occurred. In addition, accidental spills, leaks, and releases also occurred during the processing of liquid and dry pesticide formulations, which were conducted both inside and outside the United Heckathorn buildings.

In 1960, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) inspected the facility and cited United Heckathorn for the release of DDT-laden wastewater into the Lauritzen Channel. In 1965, California Department of Fish and Game staff identified a discharge of wastewater overflow into the Lauritzen Channel and leakage from the pesticide settling tanks.

Pesticide processing activities at the Site ended in approximately 1966. Between 1966 and 1970, the United Heckathorn facility buildings were demolished and cleared from the Site. In the 1970s, the Site was apparently used primarily for bulk material storage. In 1981, the Levin Metals Corporation purchased the property from the Parr-Richmond Terminal Company and has been

operating the Site since that time as a bulk shipping facility.

In 1980, the United Heckathorn Site was inspected and sampled by CDHS as part of the Abandoned Sites Project. Chlorinated pesticides and metals were detected in soil samples, and the area was designated a state Superfund Site in March 1982. EPA listed the United Heckathorn Site on the CERCLA National Priorities List (NPL) in March 1990, and took over as lead agency in August 1990.

Interim response actions were conducted from 1982 to 1993 in the upland and embankment areas of the United Heckathorn Site. As early as 1982, contaminated soil, asphalt, and concrete from the United Heckathorn Site were excavated by the current landowner and moved to a nearby lot adjacent to the Parr Canal. These materials were subsequently transported to several hazardous waste disposal facilities. In 1983, soils containing high levels of pesticides were removed by the current landowner during routine maintenance and extension of onsite railroad lines. A 6-in. to 8-in. layer of gravel was placed over the surface of the Site, including a 6-in. layer of ballast rock over the Lauritzen Channel embankment and selected areas of high DDT concentrations. In 1986, during excavation for the construction of a train scale, high levels of pesticides were detected and approximately 60 cubic yards (yd³) of soil were removed by the current landowner.

In November 1990, pursuant to EPA Removal Order 90-22, approximately 1500 yd³ of soil and visible pesticide residue containing up to 100% DDT were excavated by several PRPs (Levin, Montrose, Parr, Shell, and Stauffer) from the Lauritzen Channel embankment. This excavation was taken back to the foundation of the former Heckathorn building 1, where a pesticide deposit approximately 3 ft thick was revealed beneath the foundation. Samples of this deposit contained approximately 30% DDT. An additional 1800 yd³ of pesticide residue and contaminated soil were excavated by the same PRPs from this area in April 1991. The excavated material and stockpiles that had been placed onsite in the 1980s were hauled offsite by truck to permitted hazardous waste disposal facilities. A final soil removal action was completed in May 1993 by the same PRPs as well as Prentiss and Sherwin Williams. Assuming that the embankment deposit contained 30% DDT, over 99% of the mass of pesticides has been removed from the upland portion of the Site since 1990.

Marine sediment has not been the subject of prior removal actions or otherwise been remediated. However, as shown on Figure 3, the southeastern area of the Lauritzen Channel was last dredged for berth maintenance in 1985.

3. Highlights of Community Participation.

Six fact sheets have been released describing activities at the Site. In July, 1994 EPA released a proposed plan and the Administrative Record for the Site. Site documents were made available at the agency Superfund Records Center and at the Richmond Public Library, and a public notice was published allowing 30 days for public comment on the Proposed Plan. A public meeting was held on August 2, 1994 to describe the proposed remedy and receive comments. The public comment period was then extended an additional 30 days at the request of PRPs. Three persons made comments at the public meeting, and six written comments on the proposed plan were received during the comment period. Responses to all significant comments received during this period are contained in the attached "Analysis of Public Comments." The decision for this Site is based upon the Administrative Record.

4. Scope and Role of Remedial Actions.

The remedial actions selected in this Record of Decision are expected to be the final response actions performed at the Site. As described in the Site history above, significant interim response measures were performed at the Site in the past. These removal actions addressed the principal threats at the upland portion of the Site.

The selected remedy addresses the contaminants remaining in sediments at the Site, as well as the low levels of contaminants remaining in soils at the Site.

5. Site Characteristics.

The nature and extent of contamination at the United Heckathorn Site has been delineated by the combination of state-ordered Site investigations which occurred prior to NPL listing, and EPA's subsequent Remedial Investigation (Battelle, 1994). As discussed above, large deposits of extremely high levels of pesticides remained in upland soils after United Heckathorn ceased operations in 1966. These have been the subject of extensive excavation and removal actions over the past three years.

A soils database representing current Site conditions was compiled in EPA's Human Health Risk Assessment (ICF Technology, 1994) from the previous Site studies and removal action reports. A conservative estimate of the remaining mean Site soil concentrations of the primary Contaminants of Concern (COCs), DDT (total) and dieldrin, are 64 and 5.7 milligrams per kilogram (mg/kg), respectively. These estimates are conservative because the soils database includes the large number of additional samples which were taken to delineate the hot-spot areas for the removal actions. The actual mean Site concentrations are likely to be lower.

DDT at levels exceeding 1 mg/kg in upland soils extends over the upland portion of the Site as shown in Figure 4. The total mass of these upland soils is approximately 95,000 tons (Levine-Fricke, 1993). Confirmation sampling performed during the excavations of the most contaminated soil areas indicated that the concentrations drop to nondetectable levels in the younger bay mud immediately below the upland soils, demonstrating that the homogeneous silty-clay bay mud underlying the Site is an effective barrier to downward migration of Site chemicals.

Due to the Site's proximity to San Francisco Bay, the shallow groundwater at the Site is naturally saline and is not a source of drinking water under state or federal law.

In 1992, EPA performed a screening assessment of offsite soils (ICF Technology, 1994) in order to determine whether the historic operations of United Heckathorn could have released pesticides into the air in sufficient quantities to cause current levels of concern in nearby off-site residential soils. Sampling locations were chosen along Cutting Boulevard and immediately north of Highway 580, because the meteorological analysis for EPA's 1988 air monitoring program indicated that the strongest prevailing winds at the Site blow due north. The sampling program was therefore deliberately biased to target the area which would have had the highest levels of pesticides, had Heckathorn caused contamination. All off-site soil sampling results were well within acceptable levels for protection of human health.

The results of the RI of marine sediment, however, indicate that the occurrence of pesticides at the Site, particularly the Contaminants of Concern, DDT and dieldrin, is more widespread and at concentrations orders of magnitude higher relative to San Francisco Bay background levels than other detected contaminants. The areal and vertical distribution of marine contamination is summarized below.

Vertical core segments and channel edge grab samples were analyzed for chlorinated pesticides to delineate the areal and vertical extent of marine contamination. Results indicated that significant pesticide contamination was limited to the soft geologically recent "younger bay mud"; samples from the hard underlying "older bay mud" generally contained only traces of pesticides. Figure 5 presents the average total DDT concentration in the younger bay mud in the inner Richmond Harbor. It is significant to note that the concentration contours on this figure must be presented on a log scale in order to depict the gradient of six orders of magnitude between the Lauritzen Channel and Point Potrero. The maximum and median total DDT and maximum dieldrin concentrations throughout the study area are also shown.

Pesticide concentrations were highest in the Lauritzen Channel, and decreased with increasing distance from the former United Heckathorn Site, clearly indicating that Heckathorn was the source of contamination. The highest total DDT concentration of 633,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$) dry wt was measured in a sample from 1 ft to 3 ft below the mudline in the center of the channel. Pesticide concentrations of greater than 100,000 $\mu\text{g}/\text{kg}$ were detected in sediment from the northern and western portions of the channel. The median total DDT concentration was approximately 47,000 $\mu\text{g}/\text{kg}$ at the head of the Lauritzen Channel, which has not been dredged in a number of years. The median concentration of total DDT decreased to about 14,000 $\mu\text{g}/\text{kg}$ in the western, undredged portion of the channel, and to 1500 $\mu\text{g}/\text{kg}$ in the dredged portion of the channel near the Levin terminal. Dieldrin concentrations were lower (maximum concentration of 16,000 $\mu\text{g}/\text{kg}$), but exhibited the same spatial trend in relative concentration.

Total DDT concentrations in sediment decreased by at least two orders of magnitude from the Lauritzen Channel to the Santa Fe Channel. The median concentration of total DDT in the younger bay mud was 110 $\mu\text{g}/\text{kg}$ in the upper Santa Fe Channel and 210 $\mu\text{g}/\text{kg}$ in the federally maintained portion of the channel. DDT and dieldrin concentrations were higher in the federally maintained portion of the Santa Fe Channel, which includes the area downstream of the Lauritzen Channel. Total DDT and dieldrin concentrations decreased by another order of magnitude from the Santa Fe Channel to the Inner Harbor Channel. The median total DDT concentration was 60 $\mu\text{g}/\text{kg}$ in the upper Inner Harbor Channel, and 10 $\mu\text{g}/\text{kg}$ in the lower Inner Harbor Channel. The maximum total DDT concentration near Point Potrero was 19 $\mu\text{g}/\text{kg}$, which is approximately equal to the median DDT concentration for the periphery of San Francisco Bay, excluding the Lauritzen Channel (Long et al., 1988).

Pesticide concentrations in Parr Canal sediment were lower than those measured in the Lauritzen Channel but greater than those measured in Santa Fe or Inner Harbor Channels. The maximum and median total DDT concentrations measured in Parr Canal sediment were 4080 $\mu\text{g}/\text{kg}$ and 840 $\mu\text{g}/\text{kg}$, respectively. The maximum dieldrin concentration was 170 $\mu\text{g}/\text{kg}$. The Parr Canal is significantly narrower than it was in the 1940's, due to filling which (based on aerial photographs) occurred sometime between 1958 and 1968. Some of the material used to fill the canal may have been dredged from the harbor, possibly explaining the elevated levels of pesticides in Parr Canal sediments.

Grab samples collected from channel edges throughout the study area showed the same spatial trend in pesticide concentrations as the core samples. The total DDT concentrations in channel edge samples were consistent with the median concentration measured in core samples from that area.

Contaminant concentrations in the younger bay mud were generally not well stratified. In the shallow portions of the Lauritzen Channel, contaminant concentrations increased, and then decreased with increasing depth. The most highly contaminated sediment was generally found from 1 ft to 5 ft below the mudline. In the Santa Fe Channel, the most contaminated sediment was

found down-channel of the mouth of the Lauritzen Channel in the surface sediment, and just up-channel of the mouth in deeper sediment. Contaminant concentrations were generally higher in deeper sediment in the Inner Harbor Channel. Analysis of the volumes of contaminated sediments and the average concentrations in harbor channels indicates that 98% of the mass of DDT in harbor sediments is confined to the Lauritzen Channel.

Selected core samples collected during the marine RI were analyzed for polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and butyltins. In general, sediment from the upper Lauritzen Channel and Parr Canal had higher concentrations of PAHs, PCBs, and metals than sediment from the Santa Fe and Inner Harbor Channels. This is probably because the larger channels have been routinely dredged for navigation, whereas the northern Lauritzen and Parr have not. Only the pesticides, DDT and dieldrin, are consistently found in sediments and biota at levels orders of magnitude higher than the regional background levels.

6. Applicable or Relevant and Appropriate Requirements (ARARs)

Federal and state environmental laws which have been determined to be ARARs for the remedy are summarized below. Chemical-specific ARARs are discussed first, followed by other requirements.

Surface Waters: ARARs for surface water include EPA's ambient water quality criteria for DDT and dieldrin. These are the primary basis for the Site remediation goals.

EPA Ambient Water Quality Criteria. Section 304 of the Clean Water Act required EPA to publish criteria for water quality that accurately reflect the latest scientific knowledge on the kind and extent of all identifiable effects on health and welfare, including effects on plankton, fish, shellfish, wildlife, and plant life, which may be expected from the presence of pollutants in any body of water, based on the substances' whole-water concentration. The ambient water quality criteria for DDT and dieldrin were published in October 1980. The human health values have been updated since the original criteria publications in 1980 to reflect revised carcinogenic potency values from EPA's Integrated Risk Information System (IRIS) database (see Final Rule, 40 CFR Part 131, 57 FR 60848, December 22, 1992).

The derivation of EPA's ambient water quality criteria is discussed at length in the ecological assessment (EPA, 1994). Criteria for the protection of saltwater aquatic life are, for most pollutants, based upon toxic effects data for water-column organisms. However, for DDT and its metabolites, which bioaccumulate to high levels and may cause toxicity to organisms at higher trophic levels, it was determined that more restrictive criteria were necessary to protect fish-eating birds. The chronic marine aquatic life criterion is 1 ng/L (10^{-9} g/l, EPA 1980, EPA 440/5-80-038]). The water quality criterion for the protection of human health from the consumption from the bioaccumulation of DDT in fish is 0.59 ng/l, based on achieving a 1×10^{-6} lifetime excess cancer risk level.

The chronic marine aquatic life criterion for dieldrin of 1.9 ng/l is also residue-based, and was set at the level which would result in the achievement of the Food and Drug Administration's (FDA) action level in fish oil after bioaccumulation (EPA 1980, EPA 440/5-80-019]). This criterion is protective of sensitive aquatic organisms. The water quality criterion for the protection of human health from the consumption from the bioaccumulation of dieldrin in fish is 0.14 ng/l, based on achieving a 1×10^{-6} lifetime excess cancer risk level. The EPA aquatic life and human health water quality criteria for DDT and dieldrin are listed in Table 1.

TABLE 1. EPA Ambient Water Quality Criteria

Chemicals	Saltwater Aquatic Life (ng/L) 24-hour average	Human Health (ng/L)
DDT ^(a)	1.0	0.59
Dieldrin	1.9	0.14

(a) The sum of the 4,4'- and 2,4'- isomers of DDT, DDD (TDE), and DDE.

Section 121(d)(2)(A)(ii) of CERCLA requires that remedial actions meet federal Water Quality Criteria established under Section 304 or 303 of the Clean Water Act where such WQC are determined by EPA to be relevant and appropriate to remedial actions at the Site. See 42 U.S.C. § 9621(d)(2)(A)(ii) and 40 C.F.R. § 300.430(e)(2)(i)(G). In evaluating whether specific WQC are relevant and appropriate to remedial actions at Superfund Site, CERCLA requires EPA to consider four criteria: 1. the uses of the receiving water body; 2) the media affected; 3) the purposes of the criteria and 4) current information. See 42 U.S.C. § 9621(d)(B)(i). See also U.S. EPA, CERCLA Compliance with Other Laws Manual - CERCLA Compliance with the CWA and SDWA (OSWER Pub. 9234.2-06/FS, Feb. 1990).

EPA guidance concerning determinations that WQC are relevant and appropriate to remedial action at a Superfund Site provides that:

A water quality criteria component for aquatic life may be relevant and appropriate when there are environmental factors that are being considered at a Site, such as protection of aquatic organisms. With respect to the use of water quality criteria for the protection of human health, levels are provided for exposure both from drinking the water and from consuming aquatic organisms (primarily fish) and from fish consumption alone. Whether a water quality criterion is appropriate depends on the likely routes of exposure.

U.S. EPA, CERCLA Compliance With Other Laws Manual: Interim Final at 1-15 (EPA 540-G-89-006, Aug. 1989).

Both the marine chronic and human health WQC for DDT and dieldrin are relevant and appropriate to remedial actions at this Site since both aquatic and wildlife and humans may be exposed to these contaminants either directly or through consumption of contaminated organisms. As discussed in the Ecological Risk Assessment, aquatic organisms are present in all channels at the Site, which are a part of San Francisco Bay. Fish eating-birds feed in all channels in the harbor. In fact, the particular bird upon which the marine chronic water quality criterion for DDT was based is the California brown pelican, an endangered species, which has been observed feeding in the most contaminated channels at the Site. As discussed in the Human Health Risk Assessment, fishermen catch and consume fish from the Inner Richmond Harbor channels. In 1986, the State of California Department of Health Services ordered the posting of the Lauritzen Channel to warn fishermen of the fish and shellfish contamination. On April 7, 1994, the Cal-EPA Department of Toxic Substances Control issued an advisory against consuming any resident bottom fish, such as white croaker, from anywhere in the Inner Richmond Harbor.

The beneficial uses designated by the State of California for central San Francisco Bay waters, which are discussed below, include fishing, wildlife habitat, preservation of rare and endangered species, fish migration, fish spawning, shellfish harvesting, and estuarine habitat.

EPA's Ambient Water Quality Criteria were specifically developed to protect beneficial uses such as these.

Porter-Cologne Water Quality Act, San Francisco Bay Regional Basin Plan, and Fish and Game Code. The release of hazardous substances to surface waters is controlled under the Porter-Cologne Water Quality Control Act and implementing regulations, and the state Fish and Game Code §5650.

Beneficial uses of surface waters were designated in the Water Quality Control Plan for the San Francisco Basin (the Basin Plan) adopted by the Regional Water Quality Control Board (SFBRWQCB, 1986). The Basin Plan designates the following beneficial uses of Central San Francisco Bay, which includes the waters at the Site:

- Industrial Service Supply
- Industrial Process Supply
- Navigation
- Water Contact Recreation
- Non-contact Water Recreation
- Commercial and Sport Fishing
- Wildlife Habitat
- Preservation of Rare and Endangered Species
- Fish Migration
- Fish Spawning
- Shellfish Harvesting
- Estuarine Habitat

The Basin Plan also contains the following narrative objective:

"All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species and/or significant alterations in population or community ecology or receiving water biota. Other relevant biological measures will be considered by the Regional Board in evaluating compliance with this objective. Additionally, effects on human health due to bioconcentration will be considered."

Resolution 68-16: Statement of Policy with Respect to Maintaining High Quality of Waters in California. The State Water Resources Control Board adopted Resolution 68-16 on October 28, 1968. The Basin Plan, discussed above, states: "Whenever the existing quality of water is better than the quality of water established herein as objectives, such existing water quality shall be maintained unless otherwise provided by State Water Resources Control Boars Resolution 68-16." The SFBRWQCB has identified Resolution 68-16 as a potential ARAR for the United Heckathorn Site. While EPA does not agree that Resolution 68-16 is an ARAR, EPA and the State agree that achieving the water quality criteria identified above would meet the requirements of 68-16 regardless of whether or not it is an ARAR.

Soils and Sediments

No chemical-specific ARARs were identified as remedial goals for soils or sediments at the Site. Based on the results of the ecological assessment, mean sediment levels were calculated to prevent violations of the ARARs for surface waters, and to meet the National Academy of Sciences

(NAS) action level for DDT in fish to ensure protection of fish-eating birds, including endangered species (see discussion below).

California Code of Regulations, Title 22. The state of California has developed chemical-specific regulatory criteria for the identification of hazardous and extremely hazardous wastes, based on Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) values (California Code of Regulations, Title 22, Sections 66699 and 66723). Any waste containing a substance at a concentration equal to or exceeding a listed TTLC is classified as a hazardous waste by the California Department of Toxic Substances Control (DTSC). Extremely hazardous wastes are also classified by DTSC using TTLCs. STLCs are related to the Waste Extraction Test (WET), also described in Title 22. Any waste which produces an extract in the WET test the concentration of which exceeds an STLC, is classified as a hazardous waste by DTSC. The TTLCs and STLCs for the major COCs at the Site, DDT and dieldrin, are listed in Table 2.

TABLE 2. State of California Hazardous Waste Limits

Chemicals	TTLC (mg/kg wet wt)	STLC (mg/kg wet wt)
DDT, DDD, DDE	1.0	0.1
Dieldrin	8.0	0.8

All materials known to contain concentrations of substances exceeding the limits which classify extremely hazardous wastes have been removed from the Site. Based on the results of previous investigations and the marine RI, approximately 95,000 tons of soils in the upland area of the Site and approximately 65,000 yd³ of sediments in the Lauritzen Channel and Parr Canal exceed the California TTLC for DDT. No sediments outside these channels exceed the levels listed in Table 2. Although the TTLCs and STLCs do not represent cleanup levels, soils and sediments with chemical concentrations higher than the TTLCs or STLCs would be classified as hazardous under California law if they were dredged or excavated at the Site.

EPA has developed chemical-specific criteria for the identification of hazardous waste under the Resource Conservation and Recovery Act (RCRA). For the COCs at this Site, the criteria are not concentration-based, but are instead based on the source of the constituents (40 CFR 261.33). Product spills, for example, are RCRA-regulated, but generally releases of chemicals contained in process waste streams are not (40 CFR 261.33(d)(comment)). Based on a review of historical documents, the presence of COCs in marine sediments and remaining soils appears to be due to releases contained in waste streams from United Heckathorn's processes. Therefore, EPA has determined that the contaminated soils and marine sediments are not hazardous wastes regulated under RCRA.

Groundwater. There are no chemical-specific ARARs for the concentration of COCs in Site groundwater. Previous investigations found that salinity levels exceed federal (40 CFR 144.3) and state (SWRCB Resolution No. 88-63) limits for underground sources of drinking water. Consequently, the shallow groundwater at the Site is not considered a potential source of drinking water as defined under state and federal law.

The water quality criteria for surface waters discussed above do not apply to groundwater, although they might provide a basis for developing remediation goals in groundwater if there was a

complete pathway by which contaminants in groundwater caused violations of the criteria in surface water. However, as discussed in the previous chapter, an analysis of groundwater transport to the bay was made in 1986 as part of the initial state-ordered Site investigation. Although extremely high levels of pesticides were present in soils at that time, there were only sporadic detections of low levels of pesticides in groundwater samples, and modeling indicated that this potential pathway would not cause violations of state surface water quality objectives. Based on this analysis, groundwater monitoring was not required in subsequent state-ordered Site investigations. Subsequently, all highly contaminated soils containing approximately 99% of the mass of pesticides were removed from Site soils, further reducing any potential threat.

Air. There are no chemical-specific ARARs, such as National Ambient Air Quality Standards (NAAQS) or National Emission Standards for Hazardous Air Pollutants (NESHAPS), for the concentrations of Site COCs in the air. Air monitoring was performed at the Site prior to the removal of extremely high levels of exposed pesticides from Site soils. Even under those conditions, the concentrations in onsite and offsite air were well below levels of concern.

Fish and Shellfish. There are no chemical-specific ARARs for the concentration of COCs in fish and shellfish. The NAS saltwater action levels are TBCs, which provide an additional level of protection to fish-eating birds beyond the level that is the basis of the surface water ARARs for aquatic life. The FDA action levels for the marketability of fish and shellfish are also TBCs for protecting human health, but they are much less stringent than the levels that would be achieved by meeting the surface water ARARs discussed above.

The NAS and National Academy of Engineering published recommendations in 1972 for pollutant residues in composite samples of 25 or more whole fish of any species within the same size range as those consumed by any bird or mammal in the marine environment (EPA-R3-73-033, March 1973). The document cites studies demonstrating DDE induced shell thinning in mallards, American kestrels, Japanese quail and ring doves, and an inverse relationship between shell thickness and concentrations of DDE in eggs of wild populations of herring gulls, double-crested cormorants, great blue herons, white pelicans, brown pelicans, and peregrine falcons. The document concludes that a wet weight tissue range of 0.1 mg/kg to 0.5 mg/kg (100 µg/kg to 500 µg/kg) is "evidently higher than one which would permit successful reproduction of several fish-eating and raptorial birds." The criterion for DDT is 50 µg/kg, which is one-third the level which was the basis for the EPA water quality criteria discussed above.

Since the US Fish and Wildlife Service raised concerns that the EPA criteria for DDT might not be stringent enough for the protection of fish-eating birds, and an endangered species (the brown pelican) has been observed feeding at the Site, the NAS action level was retained as a TBC to help determine the protectiveness of remediation (see 55 FR 8745).

Other Requirements

Endangered Species Act. The Endangered Species Act of 1973, 16 USC §1531 et seq., requires the conservation of species of fish, wildlife and plants that are threatened with extinction. Compliance with the act at Superfund Sites requires the identification of any threatened or endangered species or of its critical habitat that would be affected by a proposed remedial action.

The U.S. Fish and Wildlife Service (FWS), which is the federal trustee for the protection of migratory birds, provided a list of endangered species that are known to nest in central or northern San Francisco Bay, or are likely to feed regularly in the immediate vicinity of Richmond Harbor (Table 3). Among these, the California brown pelican has been observed by EPA personnel feeding in all channels in Richmond Harbor, including the most contaminated waterways.

The FWS raised the concern that the tissue residue basis (0.15 mg/kg DDT in prey) of the surface water ARARs resulted in reproductive levels in pelicans that were still 10% to 30% below the levels needed to maintain a stable population, described in the 1976 study used to set the criteria. It should be emphasized, however, that the reproductive effects occurred when contamination was widespread in the birds' range, and that the contamination in Richmond Harbor is restricted to a small area. Nevertheless, the selected remedy is expected to also achieve the NAS saltwater action level for DDT in fish (0.05 mg/kg), which was identified as a TBC for determining the protectiveness of remediation.

TABLE 3. Endangered Species

Common Name	Nests In SF or San Pablo Bays	Feeds In/Around Richmond Harbor	Prey
Brown Pelican		Y	Fish ^(a)
Bald Eagle			Omni. ^(b)
Peregrine Falcon	Y	Y	Bird ^(c)
Clapper Rail	Y		Invert. ^(d)
Least Tern	Y	Y	Fish

(a) Fish: consumes primarily fish.
 (b) Bird: consumes primarily birds.
 (c) Omni.: diet usually omnivorous/scavenger.
 (d) Invert.: consumes primarily small- to medium-sized invertebrates.

California Endangered Species Act. The goal of the California Endangered Species Act (California Fish and Game Code §2050) is to conserve, protect, restore and enhance any endangered or threatened species and its habitat. Among the birds likely to nest or feed in the area, most of those that are listed as endangered or threatened by the state are also listed federally. The one exception is the California black rail, a state threatened species.

CDFG submitted the names of two potentially-affected plant species, both of which are listed as rare and have distributions in the north Bay and delta. They are Mason's lilaepsis, a minute, turf-forming perennial plant in the carrot family, and soft bird's-beak, a sparingly-branched, semi-parasitic herbaceous annual plant in the figwort family. The known distribution of Mason's lilaepsis, which is found on saturated clay soils regularly inundated by waves and tidal action, appears to be limited to the bay delta. Soft bird's-beak occurs in the coastal salt marshes and brackish marshes of northern San Francisco and Suisun Bays.

The surface water ARARs discussed previously are five orders of magnitude more stringent than the levels necessary to protect aquatic plants. None of the potential remedies would involve destruction of rare plants or their habitat.

Coastal Zone Management Act (CZMA). Section 307(c)(1) of the CZMA requires that federal agencies conducting or supporting activities directly affecting the coastal zone conduct or support those activities in a manner that is consistent with approved state coastal zone management programs. All remedial alternatives analyzed would affect the coastal zone. Under CERCLA Section 121(e), 42 U.S.C. § 9621(e), onsite activities are not subject to administrative review or permitting

processes, but they must be consistent with the substantive requirements of the coastal zone management plan. The approved coastal zone management program for San Francisco Bay includes the McAteer-Petris Act and the San Francisco Bay Plan, and is administered by Bay Conservation and Development Commission (BCDC).

The McAteer-Petris Act and the Bay Plan were developed primarily to halt uncontrolled development and filling of the bay. Their broad goals include reducing bay fill and disposal of dredged materials in the bay, and maintaining water quality and the ecological integrity of the bay. Generally, filling of the bay is allowable only when public benefits exceed public detriment from the loss of water areas, the filling is for a water-oriented use, and there is no alternative upland location available.

Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act, 42 U.S.C § 1344, regulates dredging and filling in waters of the United States. Several of the remedial alternatives analyzed include dredging contaminated sediments. Some of the potential disposal options include filling in waters of the United States. The United States Army Corps of Engineers (USACE) usually issues permits to conduct the above activities; however, since the actions analyzed would all occur onsite, permits would not be required pursuant to Section 121(e) of CERCLA, although the substantive requirements of the laws would still have to be met.

The determination of the acceptability of fill in waters of the United States is made under the Clean Water Act Section 404(b)(1) guidelines, which were promulgated in 40 CFR Part 230. The discharge of dredged or fill material is prohibited if there is a practicable alternative to the proposed discharge that would have less impact on the ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

California Hazardous Waste Control Law. California's hazardous waste facility closure requirements, 22 California Code of Regulations, Chapters 14 and 15, "Closure and Post Closure," are not ARARs with respect to the upland portions of the United Heckathorn Site because it is neither a hazardous waste facility nor a landfill. Some of the remedial alternatives analyzed would involve the consolidation and onsite containment of contaminated sediment. In the analysis of alternatives, operational requirements found in Title 22 of the California Code of Regulations are discussed, including limited long-term management, Site and cover maintenance, and institutional controls, including land use restrictions.

7. Summary of Site Risks and Remediation Levels.

Risk assessments were conducted by EPA to evaluate the threat to human health and the environment posed by contamination from the United Heckathorn Site. Results of these assessments and the final remediation levels established to address Site risks are summarized below.

Human Health Risk Assessment. The Baseline Human Health Risk Assessment for the Site was performed by ICF Technology Inc. for EPA (ICF Technology, 1994). The results indicate that among the various potential exposure pathways for Site contaminants, only the consumption of fish poses risks that are above EPA's acceptable risk range.

COCs at the Site were selected for evaluation in the risk assessment using the Site soil and sediment data collected by HLA (1986), Levine-Fricke (1990, 1991, 1993), and Weston (1993). The COCs selected for onsite soils were DDT (and metabolites), dieldrin, aldrin, endrin, and lead. Of

these, DDT and dieldrin are the most prevalent contaminants and are the primary contributors to risk. COCs selected for sediments were DDT and dieldrin.

Six exposure pathways were identified as potential concerns at the Site, as follows:

- ingestion and dermal adsorption of chemicals in onsite surface soils by workers at the Site;
- inhalation of fugitive dust from surface soils by onsite workers;
- ingestion and dermal adsorption of chemicals in onsite surface and subsurface soils by temporary construction workers at the Site;
- inhalation of fugitive dust from soils by temporary construction workers at the Site;
- incidental ingestion and dermal adsorption of chemicals in offsite soils by nearby residents, and;
- ingestion of contaminants in fish and shellfish from the Lauritzen, Santa Fe, and Inner Richmond Harbor Channels by fishermen and their families.

The onsite exposure pathways assume that the Site will continue to be used for commercial or industrial uses in the future. This is in accordance with the Bay Conservation and Development Commission's (BCDC) San Francisco Bay Plan which designates the area for port priority or water-related industry use, and the City of Richmond's M-3 (heavy industry) zoning of the Site and surrounding properties.

The six potential exposure pathways were evaluated according to EPA guidance, which uses conservative estimates of chemical toxicity and exposure, and cumulative risk from the addition of pathways. Chemical concentrations used in the risk assessment included both average and either Reasonable Maximum Estimates (RME) of Site concentrations or maximum measured values. EPA baseline human health risk assessments intentionally present conservative (i.e. health-protective) estimates of Site risks. Actual risks are likely to be lower and may in fact be zero.

The assessments for onsite worker exposure and offsite residential exposure are more conservative than usual because the soils databases in both cases were influenced toward higher values. The onsite soils database was skewed by the high number of samples taken to delineate the hot-spot excavation areas. Offsite soil screening samples were intentionally taken only in the immediate downwind area, which would have had the highest concentration had contamination occurred.

The cumulative risks calculated for the onsite soil exposure scenarios indicate that the removal actions that have occurred to date have reduced upland Site concentrations of chlorinated pesticides to acceptable levels. The highest RME cancer risk calculated for the various onsite upland worker scenarios (ingestion, dermal adsorption and inhalation of fugitive dusts from surface soils by a permanent worker) is 1×10^{-4} , and the maximum Hazard Index (HI) for noncarcinogenic effects is 1. More probable estimates for the same exposure scenario are 2×10^{-5} and < 1 . Risks for other onsite worker scenarios are lower. Since the onsite soils database is skewed to produce conservative results and EPA's acceptable risk range is 10^{-4} to 10^{-6} , onsite risks associated with chlorinated pesticides are acceptable.

Onsite risks for occupational exposure to lead were evaluated using EPA's 500 mg/kg to 1000 mg/kg acceptable range for residential exposure, and the state of California's draft procedure for the assessment of adult exposure to lead in soil. Mean onsite lead levels are below 500 mg/kg, and the RME lead concentration results in a 95th percentile adult blood lead level below the target concentration of 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) using the state's draft procedures. Therefore, onsite lead levels are acceptable.

Offsite residential risks for COCs in nearby soils were evaluated using the maximum values obtained in EPA's soil screening survey and conservative exposure assumptions, including childhood exposure. All results were well within the acceptable risk range for carcinogenic effects and below an HI of 1 for noncarcinogenic effects. (i.e., the maximum values measured were below a Hazard Index of 1 for noncarcinogenic effects, and below a lifetime excess cancer risk level of 10^{-4} for carcinogenic effects).

Risks to fishermen and their families who consume fish caught in the inner Richmond Harbor were evaluated using information from two sources: fish tissue data generated as part of EPA's ecological assessment of the Site, and community interviews with individuals who fish or are familiar with fishing practices in Richmond Harbor. The community interviews confirmed that fishing occurs regularly in Richmond Harbor, particularly at a Site in the Inner Harbor Channel near the Parr Canal that has unrestricted access. Although it could not be determined from the limited interviews performed whether fishing at subsistence rates occurs in the harbor, it is clear that the fishermen are from poor, minority communities, and that the fish are caught for consumption. Fishing in the Lauritzen Channel is restricted because it is surrounded by fenced industrial facilities, and fishing from boats is discouraged by warning signs in English, Spanish, Vietnamese and Laotian, posted under a 1986 order of the CDHS. Baseline risk assessments, however, assume that institutional controls, such as fences and posting, will be ineffective or not maintained. In fact, a person was photographed fishing from an industrial facility on the Lauritzen Channel during the EPA field sampling for the ecological assessment.

The results of the risk calculations indicate that the risks from long-term consumption of either whole fish or fillets of fish caught in the Lauritzen Channel are unacceptable. Using the exposure scenario which is the basis of EPA's water quality criteria for fish consumption, the lifetime excess cancer risk associated with Site COCs is above 10^{-3} for consumption of whole fish, and above 10^{-4} for fillets. In the Santa Fe and Richmond Inner Harbor Channels, lifetime excess cancer risks are within the acceptable range using the same exposure scenario. If consumption were to occur at subsistence rates, the associated risks would be approximately 10 fold higher. The proposed remedy is expected to achieve protective levels for contaminants of concern under either exposure scenario.

On April 7, 1994, the California Department of Toxic Substances Control issued an advisory against consuming any resident bottom fish, such as white croaker, from anywhere in the Inner Richmond Harbor. The State's advisory was based on levels of contaminants found in fish purchased from resident fishermen at the Parr Canal area. These fish were larger than those in EPA's studies and had slightly higher contaminant levels. The primary risk associated with the consumption of fish caught outside the Lauritzen Channel is due to contamination with polychlorinated biphenyls (PCBs), although the State would have issued the advisory based upon DDT and dieldrin contamination alone. The source of PCBs is unknown. PCBs are not related to the United Heckathorn Site, and may be present in fish throughout the bay. PCB levels in Richmond Harbor sediments are not elevated relative to typical levels in the bay.

Ecological Assessment. The Ecological Risk Assessment for the United Heckathorn Site was performed by EPA (EPA, 1994). The operations of United Heckathorn from 1947 to 1966 resulted in the release of DDT and other pesticides to and from the shoreline of the Lauritzen Channel and to San Francisco Bay. Today, in the waters of Richmond Harbor near the former plant, high levels of DDT and dieldrin remain in marine sediments. DDT and dieldrin bioaccumulate in marine organisms to the highest levels found in the state of California.

The goals of EPA's ecological assessment were to assess the threats posed to the environment by the contaminants released from United Heckathorn and to determine cleanup levels

protective of the beneficial uses of San Francisco Bay.

The waters of Richmond Harbor are part of San Francisco Bay, the West Coast's largest estuary. The estuary sustains a complex ecosystem containing thousands of species of fish, invertebrates, birds, mammals, insects, amphibians, plants and other life, as well as nearly half the waterfowl and shorebirds migrating along the Pacific flyway. Fish-eating birds, including cormorants, grebes, loons, kingfishers, and California brown pelicans (an endangered species) feed in the most contaminated channels at the Site.

The initial components of EPA's ecological assessment included a review of previous studies in the area. Highlights of this review included the findings that sediment concentrations of DDT are elevated to acutely toxic levels in the Lauritzen Channel and decline by over four orders of magnitude to near background levels in the vicinity of Point Potrero. DDT and dieldrin concentrations are extremely elevated in transplanted mussels and resident invertebrates in the Lauritzen Channel and decline by two orders of magnitude in the Inner Richmond Harbor Channel. Fish caught in the Lauritzen Channel in 1986 contained extremely high levels of DDT, which were comparable to the levels measured in 1960. Finally, a study of migratory waterfowl in San Francisco Bay found that only those which wintered in Richmond Harbor significantly accumulated metabolites of DDT. Although other chemicals are present in Richmond Harbor, they are not consistently found at levels notably above background or above levels that are likely to cause toxicity, in marked contrast to DDT and dieldrin, which are many orders of magnitude above background and were selected as the COCs for the study.

The next preliminary phase of the study was a review of the available standards, criteria, and scientific literature regarding ecological impacts of the COCs to determine as far as possible the contaminant levels in various media that could adversely impact sensitive organisms. This review indicated the ecological receptors likely to be the most sensitive and helped guide the selection of field and laboratory studies. EPA's ambient water quality criteria for DDT and dieldrin were identified as applicable to the Site. The marine chronic criteria for DDT (1 nanogram per liter, ng/L) is based upon preventing bioaccumulation in fish to levels harmful to sensitive marine birds.

The major phase of the study involved field and laboratory measurements of contaminant concentrations in various media and the performance of standard benthic tests for determining impacts from contaminated sediments. Most of the field samples were taken in October 1991. Additional fish and shellfish samples were taken in April 1992. The studies included bulk sediment toxicity testing, benthic community analyses, bioaccumulation testing, and chemical analyses in sediments, surface waters, and tissues of benthic organisms and fish and shellfish collected in trawls. An additional goal of these studies was the determination of the relationship between sediment contaminant concentrations and the concentrations in other media so that a sediment cleanup concentration could be determined which would result in the attainment of water quality criteria and protective contaminant levels in fish and shellfish tissues.

The results of the studies are summarized below. The total DDT levels measured in surface water from the Lauritzen, Santa Fe and lower Richmond Inner Harbor Channels were 50 ng/L, 9 ng/L, and 1 ng/L, respectively. The dieldrin concentrations were 18 ng/L, 2 ng/L, and nondetectable, respectively. These results indicate that the water quality criteria are violated in the Lauritzen and Santa Fe Channels, but are achieved (within the uncertainty of the analysis) or not detectable in the lower Inner Harbor Channel. Analysis of water-to-sediment ratios indicates that the Lauritzen is a source of contamination to the other channels.

Sediment concentrations of total DDT declined from over 50 mg/kg in the Lauritzen Channel to 12 μ g/kg near Point Potrero. Dieldrin concentrations declined from 570 μ g/kg in the Lauritzen to

nondetectable levels in the Inner Harbor Channel. These results are consistent with those of previous researchers, and with the more extensive RI of marine sediments (White et. al 1994).

In 28-day bioaccumulation tests using *Macoma nasuta*, tissue levels of DDT over 50 mg/kg (dry wt) and 1.5 mg/kg dieldrin were obtained using Lauritzen Channel sediments. Tissue levels declined to 80 $\mu\text{g}/\text{kg}$ DDT and undetectable levels of dieldrin using sediments from the vicinity of Point Potrero. These results are consistent with those of previous researchers. Further studies revealed that the tissue concentrations obtained at 28 days were approximately half those obtained after a 90-day exposure. Tissue residues of DDT and dieldrin measured in field-collected benthic infauna were as high as 46 mg/kg and 2.5 mg/kg (dry wt), respectively, in the Lauritzen Channel. Concentrations dropped by about two orders of magnitude in the Inner Harbor Channel.

Tissue residues of DDT and dieldrin measured in mussels (*Mytilus sp.*) were 2.6 mg/kg and 97 $\mu\text{g}/\text{kg}$ (wet wt) in the Lauritzen Channel, and declined to 40 $\mu\text{g}/\text{kg}$ and 5 $\mu\text{g}/\text{kg}$ in the lower Richmond Inner Harbor Channel. These results are consistent with those of the State Mussel Watch program. Tissue levels in the lower Inner Harbor Channel are higher than would be predicted from the underlying sediment concentration, again indicating that there is water-column transport of pesticides from the Lauritzen to less contaminated areas.

Tissue residues of DDT measured in whole fish (shiner perch) were over 10 mg/kg in the Lauritzen Channel, roughly 1 mg/kg in the Santa Fe Channel, and roughly 0.1 mg/kg in the Richmond Inner Harbor Channel. Dieldrin levels were roughly 0.6 mg/kg, 0.04 mg/kg, and 0.002 mg/kg in the respective channels. The contaminant concentrations in fish from the Lauritzen Channel are in the same range as those measured in the 1960s, and exceed the levels that may cause adverse impacts to sensitive predatory birds by orders of magnitude. A sensitive bird, which had no other source of DDT in its diet and which consumed more than 0.5% to 1.5% of its diet from the Lauritzen Channel, could be adversely affected. These concentrations may also cause direct toxic impacts such as reduced fry survival in fish. The results for the Santa Fe Channel are an order of magnitude lower, but still exceed levels that may cause adverse impacts to sensitive fish-eating birds. A sensitive bird that consumed more than 5% to 15% of its diet from the Santa Fe Channel might be adversely affected.

Sediment toxicity tests using the amphipod, *Eohaustorius estuarius*, indicated significant acute toxicity in sediments from the Lauritzen Channel. Sediments from the Santa Fe Channel displayed lower but significant toxicity relative to the amphipod's native Yaquina Bay, Oregon, sediment, but were not significantly different from those in the Inner Harbor Channel or other San Francisco Bay locations. DDT was determined to be the primary cause of toxicity in the Lauritzen Channel.

Additional toxicity tests conducted during the RI using the amphipod *Rhepoxynius abronius* confirmed the acute toxicity of Lauritzen Channel sediments. In four of five Lauritzen Channel compoSite samples, there was no survival of test organisms, an extremely rare occurrence indicating severe toxicity. Amphipod survival in samples beginning at the southern end of the Lauritzen Channel and proceeding out the harbor was not significantly different than survival in the San Francisco Bay fine-grained sediment control, indicating that the toxicity is confined to the Lauritzen.

An analysis of benthic infauna indicated that amphipod abundance (with the exception of the pollutant-tolerant *Grandidierella japonica*) was inversely related to DDT concentration. The minimum benthic ecological effects concentration was determined to be 100 μg DDT/g organic carbon (equivalent to 1.9 mg/kg, dry wt, at 1.9% organic carbon).

Overall, the results indicate that the gross contaminant levels in the Lauritzen Channel threaten a variety of ecological receptors at various trophic levels, including benthic and water-column organisms and fish-eating birds. Effects are likely to be much less severe in the Santa Fe Channel, although the contaminant levels in fish are significantly higher than the levels that may threaten sensitive fish-eating birds. In the Richmond Inner Harbor Channel, the DDT levels in fish (100 $\mu\text{g}/\text{kg}$) are between the level that is the basis of EPA's chronic marine water quality criteria intended to protect marine birds (150 $\mu\text{g}/\text{kg}$), and the National Academy of Sciences (NAS) recommendation (50 $\mu\text{g}/\text{kg}$) for protecting marine birds. It is clear from the results above that the most sensitive ecological receptors to sediment organochlorines in Richmond Harbor are likely to be fish-eating marine birds.

The only contaminated medium for which applicable regulatory criteria were identified is surface water. Nonregulatory or surrogate criteria were also identified for fish and shellfish tissues and sediments. Fortunately, surface water concentrations were found to be quite consistent during different tidal cycles and seasons in each of the three channels sampled. In addition, the concentrations measured in the water column and the concentrations measured in whole fish were found to agree remarkably with the concentrations predicted by the applicable EPA marine chronic water quality criteria. This demonstrates that total DDT present in surface waters is bioavailable, and that it accumulates as predicted by the applicable marine chronic criteria.

The analysis of surface water pesticide concentrations in the three channels indicates that the concentrations in the Santa Fe and Richmond Inner Harbor Channels are likely elevated by approximately one order of magnitude over the concentrations that would result from the respective local sediment concentrations, due to the flux of contaminated water from the Lauritzen Channel. This indicates that remediation of the Lauritzen would have beneficial effects throughout the Inner Harbor.

Site Remediation Goals. The final goal of the ecological assessment was to provide sufficient information to develop Site remediation goals for contaminated marine sediments containing the COCs, DDT and dieldrin, which would be protective of the environment and human health. The DDT and dieldrin water quality criteria are near or below the levels which can be quantified by the best laboratories. Protective levels in sediments are much more readily measurable, particularly for DDT. Although DDT and dieldrin co-occur, the DDT concentration is generally 10 to 100 times higher, and DDT was detected in sediment samples over a wider area. Sediment remediation goals, which are expected to attain protective levels for both contaminants, have therefore been established based on DDT concentration.

As indicated above, it was determined that the minimum ecological effects concentration for benthic organisms was 100 μg DDT/g of organic carbon, which is equivalent to 1,900 $\mu\text{g}/\text{kg}$ (dry wt) at 1.9% organic carbon. Sediment concentrations exceeding this value might cause local chronic adverse impacts to benthic organisms. EPA has reviewed data for other DDT-contaminated Sites, and found a similar threshold for benthic effects. Sediments in the Lauritzen Channel and Parr Canal exceed this level. The maximum concentrations outside these channels are below this level.

The EPA marine chronic water quality criteria of 1 ng/L DDT is likely to be achieved if the average channel sediment concentration is below 1,000 $\mu\text{g}/\text{kg}$ DDT (dry wt); and the human health criteria of 0.6 ng/L is likely to be achieved if the average sediment concentration is below 590 $\mu\text{g}/\text{kg}$ DDT.

TABLE 4. Remediation Levels

Final Remediation Levels				Cancer Risk Level
Medium	Chemical	Level	Basis	
Surface Water	DDT	0.59 ng/l	EPA AWQC	1 X 10 ⁻⁶
	Dieldrin	0.14 ng/l		1 X 10 ⁻⁶
Sediment	DDT	Avg: 590 µg/kg	Ecological Assessment	1 X 10 ⁻⁶

The average sediment concentrations in the Lauritzen Channel and Parr Canal exceed the 590 µg/kg DDT level, while the average concentrations in the Santa Fe and Inner Harbor Channels are below the level. Therefore the remediation of sediments will be limited to the Lauritzen Channel and Parr Canal. Although the concentrations of pesticides in upland soils are acceptable for human exposure, they exceed the protective levels for sediments in the adjacent channels, indicating that erosion of upland soils and stormwater runoff to the marine environment should be prevented.

The NAS action level for the concentration of DDT in fish to protect fish-eating birds is not an ARAR but was identified as a TBC to assist in determining the protectiveness of remediation. The NAS action level is likely to be achieved if the average channel DDT sediment concentration is below 420 µg/kg. Since the average concentrations of DDT in the Santa Fe and Inner Harbor Channels are below this level, cleanup of sediments in the Lauritzen Channel and Parr Canal is expected to result in achievement of the NAS action level.

8. Description of Alternatives.

The environmental media requiring remediation are soft marine sediments (young bay muds) in the Lauritzen Channel and Parr Canal. Contamination is confined to softer younger bay mud, and has not migrated into the underlying older bay mud. The volume of contaminated sediment in the Lauritzen Channel and Parr Canal is approximately 65,000 yd³. Remediation of this sediment is expected to result in achievement of the remedial action goals. In addition, erosion of upland soils containing DDT at concentrations exceeding the final remediation level for sediments must be prevented. No action will be taken in other areas in Richmond Harbor, such as the Santa Fe Channel and Inner Harbor Channel, because sediment levels are below the remediation levels established above.

The action alternatives presented below all include dredging of contaminated sediments and paving of upland soils on the northern half of the Levin Richmond Terminal. The principal difference among these alternatives is in the location chosen for disposal of dredged sediments. In addition, the "no action" alternative has been retained as a baseline for comparison with the other alternatives, as required by the National Contingency Plan, 40 C.F.R. § 300.430(e)(6). The four alternatives are summarized below:

Alternative 1: no action

Alternative 2: confined disposal of marine sediment in the Port of Richmond's Point Potrero graving docks, and capping of upland areas

Alternative 3: confined disposal of marine sediment in the Lauritzen Channel, and capping of upland areas

Alternative 4: offsite disposal of marine sediment by rail, and capping of upland areas.

With the exception of "no action," all of the alternatives have been developed to meet the remedial action goals. In addition to the components listed above, each action alternative includes environmental monitoring to evaluate the effectiveness of the remedy, and institutional measures to limit future Site uses to those considered in the human health risk assessment.

Common Elements

Elements which are common to two or more alternatives, including dredging, monitoring, paving of upland areas, and institutional controls, are discussed below.

Dredging. Alternatives 2 through 4 would involve dredging of the younger bay mud from the Lauritzen Channel and Parr Canal. The total volume of these sediments is estimated to be 65,000 yd³, although if Alternative 2 were selected, some of the most contaminated sediments would remain in place in the Lauritzen Channel within a Confined Disposal Facility (CDF). In areas to be dredged, all soft sediments down to the hard older bay mud contact would be removed.

Silt curtains would be erected across the mouths of the channels prior to dredging to prevent transport of sediment disturbed by the dredging process out of the excavation area. In addition, control measures would be implemented to prevent or minimize the runoff or return of sediment back to the excavation areas. The surface water ARARs for the concentrations of COCs are not currently achieved, and would not be expected to be achieved in the Lauritzen Channel and Parr Canal during the dredging phase of remediation at the Site. The surface water ARARs are remedial action goals which are expected to be achieved after the dredging is completed.

Two sunken barges, one small tank, and other debris (see Figure 3) would have to be removed from the Lauritzen Channel prior to dredging under Alternatives 2 through 4. In one of the configurations of Alternative 3, a CDF would be constructed in the northern end of the channel, allowing one barge and the small tank to remain in place. Samples of sediment taken by EPA divers from inside the barge and tank indicated that they are not sources of contamination.

Monitoring. In order to determine the effectiveness of the remedial action, a post-remedial monitoring program would be required. Monitoring would be expected to occur annually for at least five years or until it was demonstrated that the remediation goals had been achieved, and could continue at longer intervals (e.g., once every five years) for an additional period of time. The monitoring program would also be implemented as part of the "no action" alternative.

The post-remedial monitoring program would include surface water and biological monitoring components. Periodic collection and analysis of surface water samples would determine compliance with EPA ambient water quality criteria, which are ARARs. Bioaccumulation could be monitored through the periodic deployment and subsequent collection and analysis of mussels, as is done in the State Mussel Watch program. Mussels provide the most consistent, readily obtainable biological data. These data can be compared to the historic State Mussel Watch bioaccumulation

database for Richmond Harbor to confirm reductions in tissue residues. Sampling locations to confirm the effectiveness of the remedy would be in the Lauritzen, Santa Fe and Richmond Inner Harbor Channels. Additional sampling might be required based on the remedy selected. For example, if confined disposal at the Port of Richmond's graving docks were selected, an additional monitoring station would be established outside the facility.

Capping of Upland Area. The results of the human health risk assessment indicate that the removal actions performed at the Site between 1990 and 1993 reduced contaminant concentrations in upland soils to levels that are acceptable for current and expected future commercial or industrial uses. Nevertheless, roughly 95,000 tons of soils over a large area of the Site exceed the much lower remedial action goal for marine sediments. Therefore, a remediation goal of erosion prevention was established for upland soils. The northern half of the Levin Richmond Terminal, which is where the United Heckathorn facility was located and where concentrations exceed 1 mg/kg DDT, is currently unpaved. Each of the action alternatives includes paving this area with asphalt. The area of the upland asphalt cap is shown in Figure 6. The cost of capping this area was estimated in the FS performed by Levine-Fricke (1991). The estimate of \$400,000 includes a 20% contingency. This cost is included in the estimates generated for each remedial alternative except "no action."

Institutional Controls. The human health risk assessment concluded that the concentrations of COCs in upland soils at the Levin Richmond Terminal had been reduced to acceptable levels for current and expected future industrial uses. This is consistent with the San Francisco Bay Plan under which the area is zoned for port priority or water-related industrial use. In order to provide an additional measure of assurance that the Site could not be converted to other use, such as residential, without further study and possibly further remediation, a deed restriction on the property will be included as part of Alternatives 2 through 4.

The Lauritzen Channel is currently posted with signs warning fishermen that fish and shellfish may be contaminated with DDT and other pesticides. These signs will remain in place until post-remedial monitoring confirms that concentrations of the COCs have been reduced to acceptable levels.

Alternative 1: No Action with Monitoring. The NCP requires the analysis of no action as an alternative (40 CFR 300.430(e)(6)). Under no action, no further remediation would be conducted at the Site, although the monitoring program would still be performed to evaluate the effects of the remaining contamination. The existing institutional controls would remain in place.

The no action alternative does not meet either of the two threshold criteria described below (overall protection of human health and the environment, and compliance with ARARs). Because the threshold criteria are not met, this alternative is not eligible for selection.

Alternative 2: Dredging with Containment at the Point Potrero Graving Docks. The major components of this alternative are dredging approximately 65,000 yd³ of contaminated sediment from the Lauritzen Channel and Parr Canal, and disposing of the sediment in a CDF constructed at the Port of Richmond's graving docks.

The graving docks are located at Point Potrero, at the southern end of the Richmond Inner Harbor Channel, approximately one mile from the location of the former United Heckathorn facility (see Figure 2). A sediment containment facility constructed at the graving docks could be determined to be "onsite" under the definition of the NCP, which includes all locations within the areal extent of contamination and all suitable areas in very close proximity necessary for implementation of the response action (40 CFR 300.5).

Graving docks are concrete box structures used to drydock ships. The Point Potrero graving docks were built during World War II and, due to their relatively small size, are obsolete for modern vessels. The Port of Richmond suggested that the graving docks be analyzed as a potential disposal Site for contaminated sediments because they have the capacity to effectively contain very large volumes. Depending on the configuration and number of basins used, the facility could contain between 89,000 yd³ and 500,000 yd³ of sediment. The facility would not be simply a disposal Site, but would be constructed so that it would be suitable for use as a marine shipping terminal. Use of the graving docks would not be offered by the Port of Richmond for disposal alone. The Port has analyzed a number of alternative configurations which would accommodate varying volumes of dredged material and provide the Port an additional berth or pier of at least 600 ft. The Port's cost estimates for each of the various configurations include the costs of preparing the basins to receive dredged material, and the costs of enhancing the facility for Port use.

The configuration chosen for analysis would entail filling Basin 1 with approximately 65,000 yd³ of sediment dredged from the Lauritzen Channel and Parr Canal, and 24,000 yd³ of additional material to produce a total of 89,000 yd³. This is the lowest cost configuration which would provide sufficient volume to contain sediments dredged from the Lauritzen Channel and Parr Canal. Prior to receiving sediment, Basin 1 would be inspected and repaired if necessary, and then sealed with a concrete bulkhead. Wick drains would be installed for dewatering. The pier between Basins 2 and 3 would be removed, and Basin 3 would be lengthened from 500 ft to 750 ft, creating a new berth for large ships.

Dredged sediment would be barged to the drydock and deposited by mechanical means in order to minimize entrainment of water. It is estimated that consolidation of the sediment within the basin would take a minimum of four years. If hydraulic dredging were used, consolidation would probably take longer. The average concentration of DDT in the sediment would be 30 mg/kg wet wt. Based on the results of the treatability testing performed during the marine RI, it is expected that treatment by filtration and carbon adsorption would be required before effluent produced by dewatering could be discharged from the basin to the bay. Although a Waste Discharge Permit would not be required under CERCLA, substantive requirements would have to be achieved, including toxicity limits and compliance with numeric water quality criteria. A possible alternative would be to discharge effluent to a sanitary sewer under permit from the local agency. Discharges to the sewer system would be "offsite" and require permitting.

In addition to the actions described above, this alternative would include the post-remedial monitoring program, removal of the sunken barges and other debris from the Lauritzen Channel, asphalt paving of the northern half of the Levin Richmond Terminal, and institutional controls. The estimated cost of this alternative included roughly \$700,000 to prepare Basin 1 and close it after filling, and roughly \$1.8 million to remove the pier between Basins 2 and 3, and lengthen Basin 3 to produce a 750-ft berth. Annual overhead and maintenance costs include evaluation and repair of the graving docks, operation and maintenance of an effluent treatment system for dewatering sediment, and post-remediation monitoring. The total estimated cost for this alternative is \$5.6 million. This estimate does not include the costs, which could be substantial, of obtaining an agreement among various parties regarding the use of the facility and future liability. In addition, state and federal agencies have indicated that they might seek mitigation to compensate for the fill associated with this alternative. The costs of mitigation would also significantly increase the total cost of this alternative.

This alternative would be expected to meet the remedial action goals defined in Table 4 and provide effective long-term protection of human health and the environment. It is unclear, however, whether it would comply with ARARs related to bay fill unless an upland alternative were unavailable. Dredging would cause short-term impacts within the excavation areas. Because the

dredged sediment would be classified as hazardous waste pursuant to State of California regulations, this alternative would require agreements between a number of government and private parties regarding long-term liability and operations and maintenance, limiting its implementability.

Alternative 3: Dredging with Containment at Lauritzen Canal. The major components of this alternative would be dredging between 44,000 yd³ and 52,000 yd³ of contaminated sediment from the Lauritzen Channel and Parr Canal, and depositing it in a CDF constructed within the Lauritzen Channel. Two variations of CDFs were analyzed for this alternative based on alternatives developed by Levine-Fricke (1991). The first consists of a steel sheetpile wall approximately 1300 ft long constructed along the eastern shoreline of the channel. The sheetpile wall would be tied to anchors placed in the soil at the Levin Richmond Terminal. This configuration does not interfere with either the storm drain at the northern end of the channel, or with properties across the channel from Levin.

The second variation of a CDF in the Lauritzen would consist of a rock dam across the northern end of the Lauritzen Channel. Advantages of this configuration are that it would minimize the dredging of the most contaminated sediments in the channel; the barge, tank, and debris in the northern end of the channel could remain in place; it would require less maintenance than a steel sheetpile wall; and it would be less costly to construct.

Dredged sediment could be deposited in the CDF by mechanical means, or by hydraulic dredging. Consolidation of the sediment within the basin would take several years. The average concentration of DDT in the sediment would be 30 mg/kg wet wt. Based on the results of the treatability testing performed during the marine RI, it is expected that treatment by filtration and carbon adsorption would be required before effluent produced by dewatering could be discharged from the basin to the bay. Although under CERCLA a Waste Discharge Permit need not be obtained, substantive requirements would have to be achieved, including toxicity limits and compliance with numeric water quality criteria. A possible alternative would be to discharge effluent to a sanitary sewer under permit from the local agency. Discharges to the sewer system in this case would be "offsite" and require permitting.

In addition to the actions described above, this alternative would include the post-remedial monitoring program, asphalt paving of the northern half of the Levin Richmond Terminal, removal of at least one sunken barge from the Lauritzen Channel, and institutional controls. Annual overhead and maintenance costs include evaluation and repair of the CDF, operation and maintenance of an effluent treatment system for dewatering sediment; and post-remediation monitoring. The cost of dredging the sediment for this alternative would be slightly lower than the costs described for the previous alternative since some of the sediment would remain in place and transportation would not be required. The estimated cost range is \$13 million for the sheet-pile wall variation and \$4.3 million for the rock dam. In addition, state and federal agencies and the Port of Richmond have indicated that they might seek mitigation to compensate for the fill associated with this alternative. The cost of mitigation would also significantly increase the total cost of this alternative.

This alternative would be expected to meet the remedial action goals defined in Table 4 and provide effective long-term protection of human health and the environment. It is unclear, however, whether it would comply with ARARs related to bay fill unless an upland alternative were unavailable. This alternative would require the least amount of dredging, which would minimize short-term impacts within the excavation areas. The rock dam variation of this alternative would have an impact on adjacent property owners, which could hinder implementability. In addition, because the dredged sediment would be classified as hazardous waste pursuant to State of California regulations, this alternative would require agreements between a number of government and private parties regarding long term liability and operations and maintenance, limiting the

implementability of this alternative.

Alternative 4: Dredging with Offsite Disposal. The major components of this alternative are dredging approximately 65,000 yd³ of contaminated sediment from the Lauritzen Channel and Parr Canal, and transportation of the sediment by rail to a permitted offsite disposal facility. Transport by rail offers several significant advantages. The Levin Richmond Terminal is a rail facility with lines running the length of the shoreline of the Lauritzen Channel. Since dredging can produce very large volumes of sediment very quickly, the limiting factor in removing sediment from the Site would be the time required to load it for transport. Watertight rail cars would be used to prevent releases during transportation. A rail car can carry 100 tons, and a single train can transport approximately 8000 tons. It is estimated that the entire project could be accomplished in about two months.

In addition to the actions described above, this alternative would include the post-remedial monitoring program, asphalt paving of the northern half of the Levin Richmond Terminal, removal of barges and debris from the Lauritzen Channel, and institutional controls. The estimated cost for this alternative is \$7.3 million. Since the sediments would be transported offsite to a permitted disposal facility, long-term operations and maintenance costs are only those associated with the monitoring program and maintenance of the asphalt paving at the Site. The estimated disposal cost for this alternative includes transportation by rail and was provided by the East Carbon Development Corporation, a facility in eastern Utah which is permitted to receive non-RCRA wastes.

This alternative would be expected to meet the remedial action goals defined in Table 4, provide effective long-term protection of human health and the environment, and comply with all ARARs. Dredging would cause short-term impacts within the excavation areas. Disposal of sediments at an offsite facility would require no bay fill, and would minimize long-term maintenance costs and liabilities. Offsite disposal by rail appears to be implementable at a reasonable cost.

9. Summary of Comparative Analysis of Alternatives.

The alternatives were analyzed using the nine criteria of the NCP (see 40 CFR 300.430(f)(5)(i)). The comparative analysis with respect to each criteria is summarized below. Overall, it was determined that Alternative 4, Dredging with Off-Site Disposal provides the best balance among the alternatives with respect to the evaluation criteria.

Overall Protection of Human Health and the Environment: All of the alternatives except "no action" are expected to provide adequate protection of human health and the environment. The risks associated with the COCs are due to their current location in or near the aquatic environment. Alternatives 2 and 3 would achieve protection by isolating the contaminants from the aquatic environment in onsite confined disposal facilities which would require perpetual maintenance to ensure that contaminants were not re-released to the marine environment. Alternative 4 would achieve protection by transporting contaminants offsite.

Compliance with ARARs: The "no action" alternative would not result in compliance with ARARs. Alternative 2, confinement in the Port of Richmond's graving docks, relies on the dual purpose of the remedy to create a port facility in order to achieve consistency with the CZMA and compliance with the Clean Water Act. Alternative 3, confinement in the Lauritzen Channel, would probably not be consistent with the CZMA or the Clean Water Act unless it was determined that there was no practicable alternative. Alternative 4, offsite disposal, complies with all ARARs, and appears to be practicable.

Long-term Effectiveness and Permanence: Alternatives 2 through 4 are all expected to provide adequate long-term effectiveness and permanence. Concrete vaults and shoreline CDFs have been

used successfully at other Sites to contain contaminated sediments, although they require perpetual maintenance. Alternative 4, offsite disposal, provides the highest degree of permanence because the contaminated sediments would be stored far from the aquatic environment. Although the contaminated sediment presents an unacceptable threat to human health and the environment because of its current location which allows exposure to marine organisms and biomagnification in the food chain, the expected average concentration after dredging of approximately 30 mg/kg is well within the acceptable range for direct human exposure, and would not present a direct threat when contained in a disposal facility.

Reduction of Toxicity, Mobility, or Volume through Treatment: None of the alternatives employs treatment. Alternatives 2 through 4 meet the expectation of the NCP for containment of high volumes of waste which have relatively low contaminant concentrations. Based on the process screening conducted in the FS, treatment of the COCs in Site sediments would not be practicable. Site upland soils which contained extremely high levels of contaminants were addressed in previous removal actions.

Short-term Effectiveness: None of the alternatives would be expected to cause short-term risks to the community. The risks to workers are expected to be primarily those associated with construction, transportation, dredging, and solids handling. All of the dredging alternatives would cause short-term impacts within the excavation areas, and would remove the existing benthic communities from the bottoms of the Lauritzen Channel and Parr Canal. However, it is expected that the channel bottoms would be recolonized by more diverse populations. Alternative 4, offsite disposal, would achieve protection in the shortest amount of time.

Implementability: Alternative 4 is the most readily implementable. It would require the least amount of onsite construction and preparation, and should have no administrative impediments. Alternative 2, consolidation at the Port of Richmond's graving docks, would require a complex agreement between the City of Richmond and other parties regarding ownership, operations, and liability. Alternative 3, consolidation in a CDF in the Lauritzen Channel, would likely encounter state opposition, and could require agreements among adjacent property owners regarding loss of shoreline and access, as well as agreements with PRPs and several government agencies, including the City of Richmond, DTSC and EPA.

Cost: The estimated costs for all of the alternatives are comparable. The cost for Alternative 4, offsite disposal, while not the lowest, is the most certain. The estimated costs for Alternative 2, confinement at the Port of Richmond's graving docks, and Alternative 3, confinement at the Lauritzen Channel, would be more likely to change given the need for agreements among parties regarding ownership, maintenance and liability for facilities containing wastes exceeding state hazardous levels. The costs for construction, dewatering, effluent disposal, and hazardous waste storage are also less certain than the offsite transportation and disposal costs. In addition, the cost estimates for alternatives 2 and 3 did not include possibly significant costs for mitigation of bay fill, which had been proposed by state and local agencies.

State Acceptance: The Department of Toxic Substances Control of Cal-EPA, which is the lead state agency for oversight at this Superfund Site, agrees with the selected remedy. In addition, the San Francisco Bay Regional Water Quality Control Board and the San Francisco Bay Conservation and Development Commission also agree with the selected remedy.

Community Acceptance: Based on the comments received during the Proposed Plan comment period, it is evident that the selected remedy is acceptable to the community. No comments were received from the community opposing the selected remedy or supporting other alternatives.

10. Selected Remedy.

The selected alternative is dredging with off-site disposal. Components of the selected remedy include:

- Dredging of all soft bay mud from the Lauritzen Channel and Parr Canal, with off-site disposal by rail of dredged material.
- Placement of clean sediment after dredging.
- Capping of areas around the former Heckathorn facility, shown in Figure 6.
- A deed restriction or notice limiting use of the Levin-Richmond terminal to the current industrial classification.
- Marine monitoring to determine the effectiveness of the remedy.

The remedy will involve dredging of the younger bay mud from the Lauritzen Channel and Parr Canal. The total volume of these sediments is estimated to be 65,000 yd³. In areas to be dredged, all soft sediments down to the hard older bay mud contact would be removed. Two sunken barges, one small tank, and other debris (see Figure 3) would be removed from the Lauritzen Channel prior to dredging. In limited areas dredging may be impractical or of limited effectiveness in removing all contaminated sediments because of obstructions such as rip-rap and capping may be required.

Silt curtains will be erected across the mouths of the channels prior to dredging to prevent transport of sediment disturbed by the dredging process out of the excavation area. Dredged material will either be loaded directly onto rail cars or stockpiled on a barge or on land to facilitate loading. Excess water, if any, produced during dredging and initial handling will be returned to the dredging area inside the silt curtains. However, control measures, such as physical separation or filtration, will be implemented to prevent or minimize the runoff or return of sediment back to the excavation areas. The surface water ARARs for the concentrations of COCs are not currently achieved, and would not be expected to be achieved in the Lauritzen Channel and Parr Canal during the remediation. The surface water ARARs are remedial action goals which are expected to be achieved after the remediation is complete.

The dredged material will be transported by rail to a permitted land disposal facility which meets the requirements of the CERCLA offsite policy. The expected average concentration of approximately 30 mg/kg, is well within the acceptable range for direct human exposure, and will not present a long-term threat at a disposal facility. Monitoring of surface water and biota will occur for at least five years or until it is demonstrated that the remediation goals have been achieved, and could continue for a longer period of time. To promote the return of flora and fauna to the dredged areas, a 1/2 foot layer of clean material will be placed after dredging. The material will not significantly alter the existing bathymetry or impede navigation. The estimated cost for the selected remedy is \$7 million.

The selected remedy provides overall protection of human health and the environment, complies with ARARs, and provides the best overall balance of alternatives under the nine selection criteria of the NCP.

11. Statutory Determinations

The selected remedy is protective of human health and the environment, complies with ARARs, and is cost effective. The principal threats at the Site were addressed by removal actions. Because this remedy will result in hazardous materials remaining onsite, a review will be conducted five years after the commencement of remedial action, and every five years thereafter, to ensure that the remedy continues to provide adequate protection of human health and the environment.

12. Documentation of Significant Changes.

The proposed plan for the Site was released for public comment in July, 1994. The proposed plan identified alternative 4, dredging with offsite disposal as the preferred alternative. EPA reviewed all written and oral comments submitted during the comment period. Upon review of these comments, EPA determined that no significant changes to the remedy, as it was originally identified in the proposed plan, were necessary.

During the proposed plan comment period, the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service recommended that a layer of clean material be placed in the channels after dredging for restoration. The material would promote the return of habitat and fauna to the dredged areas. The proposed plan included the placement of clean fill in limited areas. The final remedy includes placement of a 1/2 foot layer of clean material after dredging in the Lauritzen Channel and Parr Canal. The cost of placing clean material, which would apply to all alternatives except "no action," was not included in the estimates contained in the FS or proposed plan. The estimated cost is \$200,000, which increases the total estimated cost from \$6.8 million in the proposed plan to \$7 million for the final remedy.

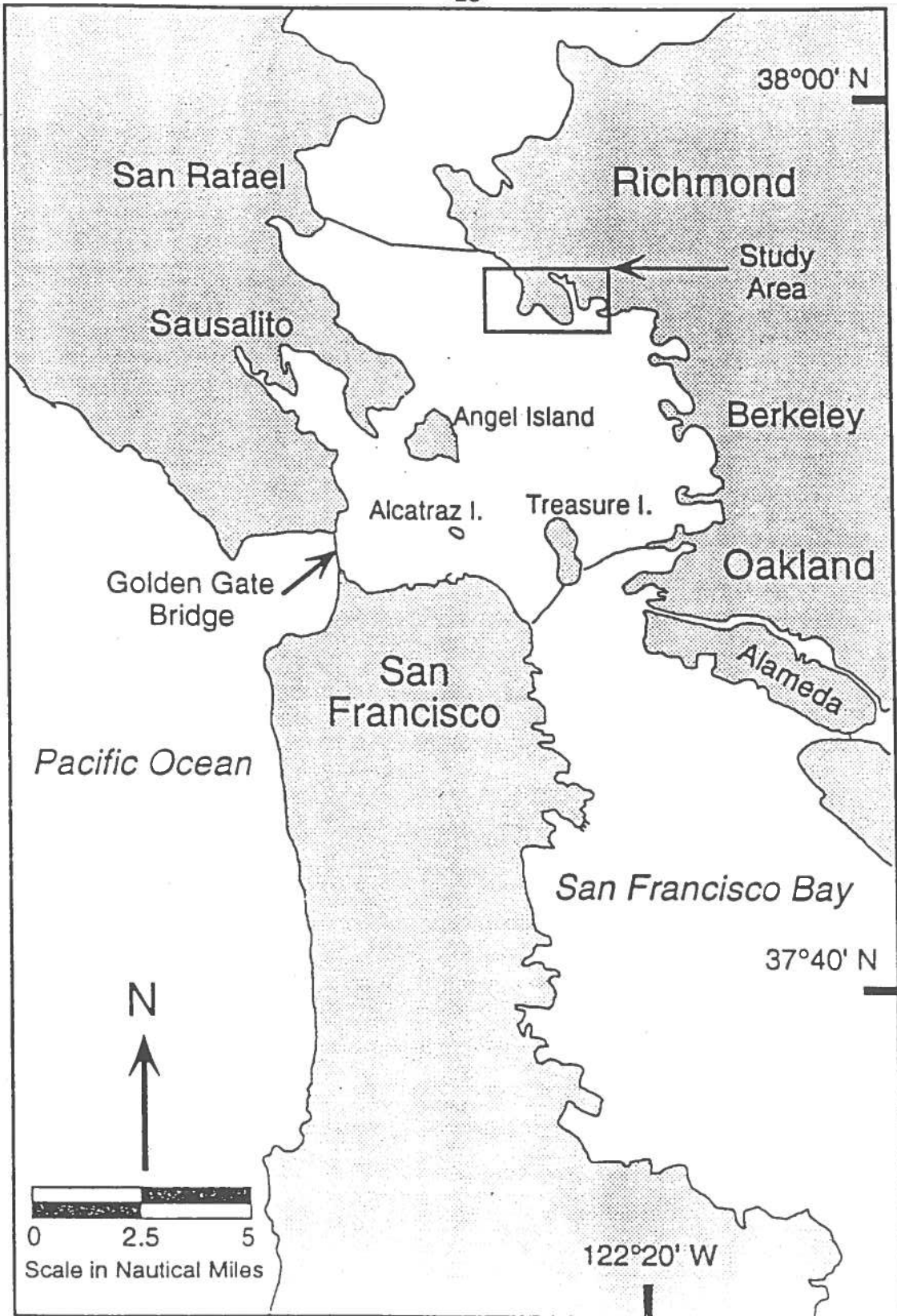


Figure 1. Site location map.

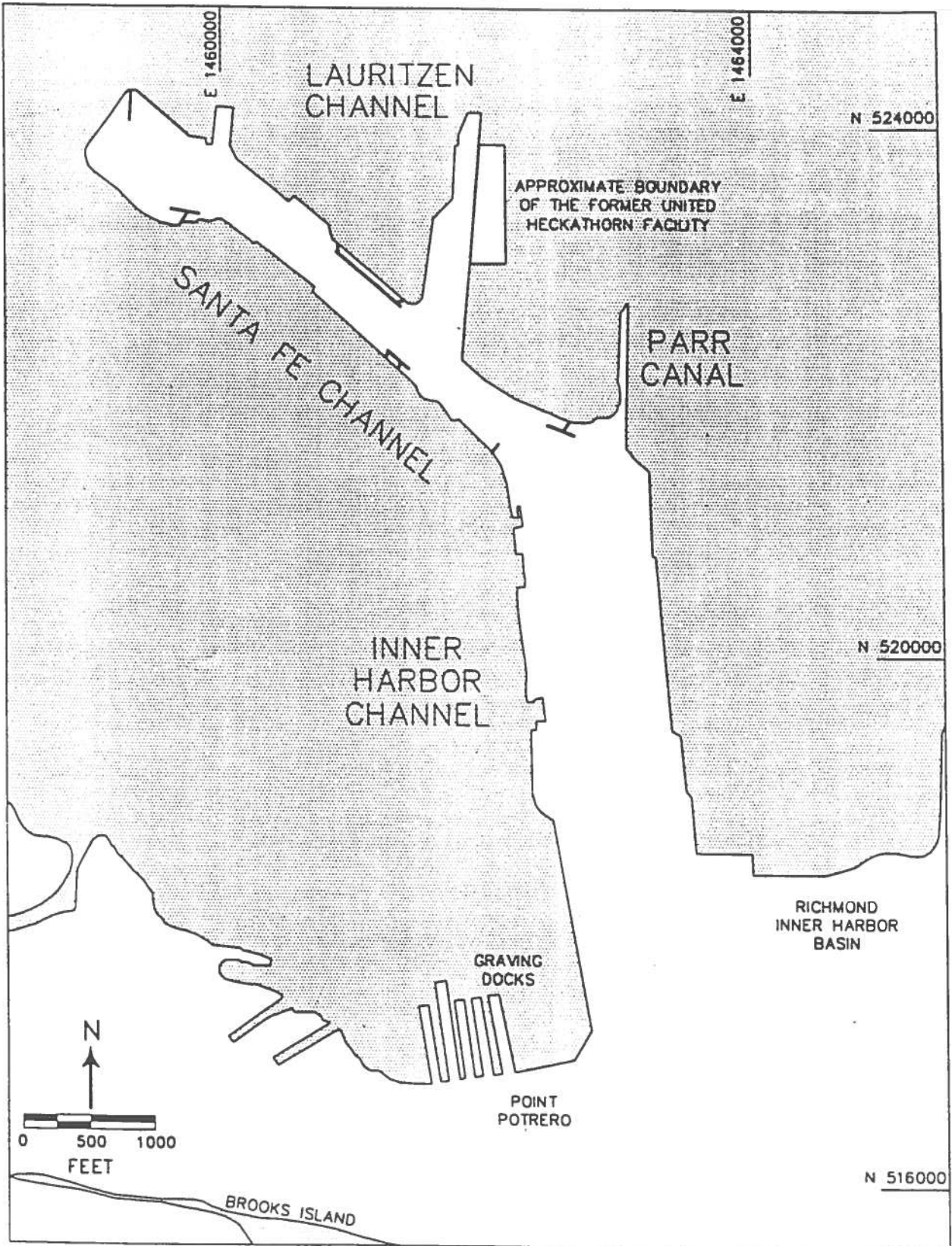


Figure 2. Map of Richmond Harbor.

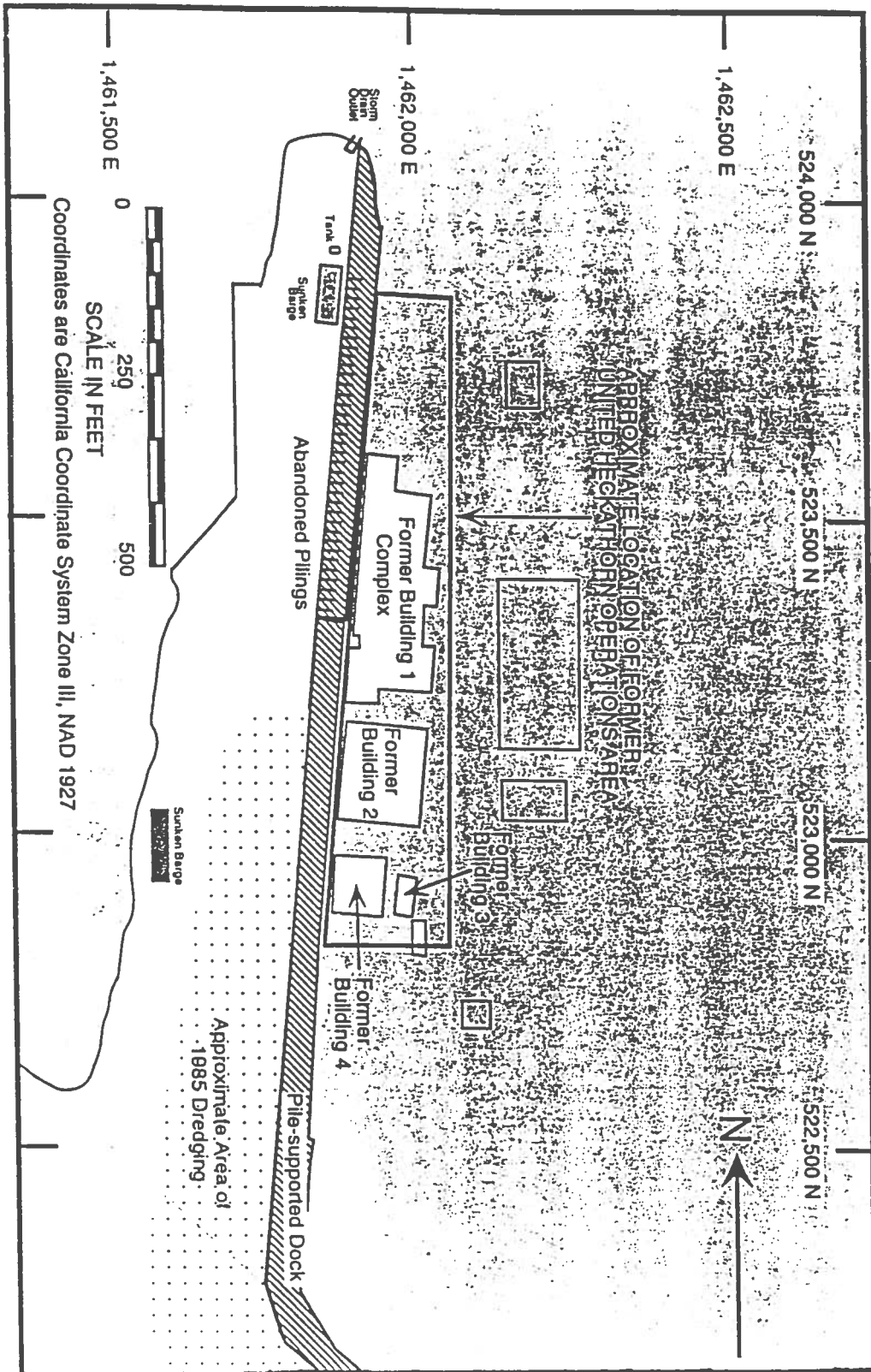
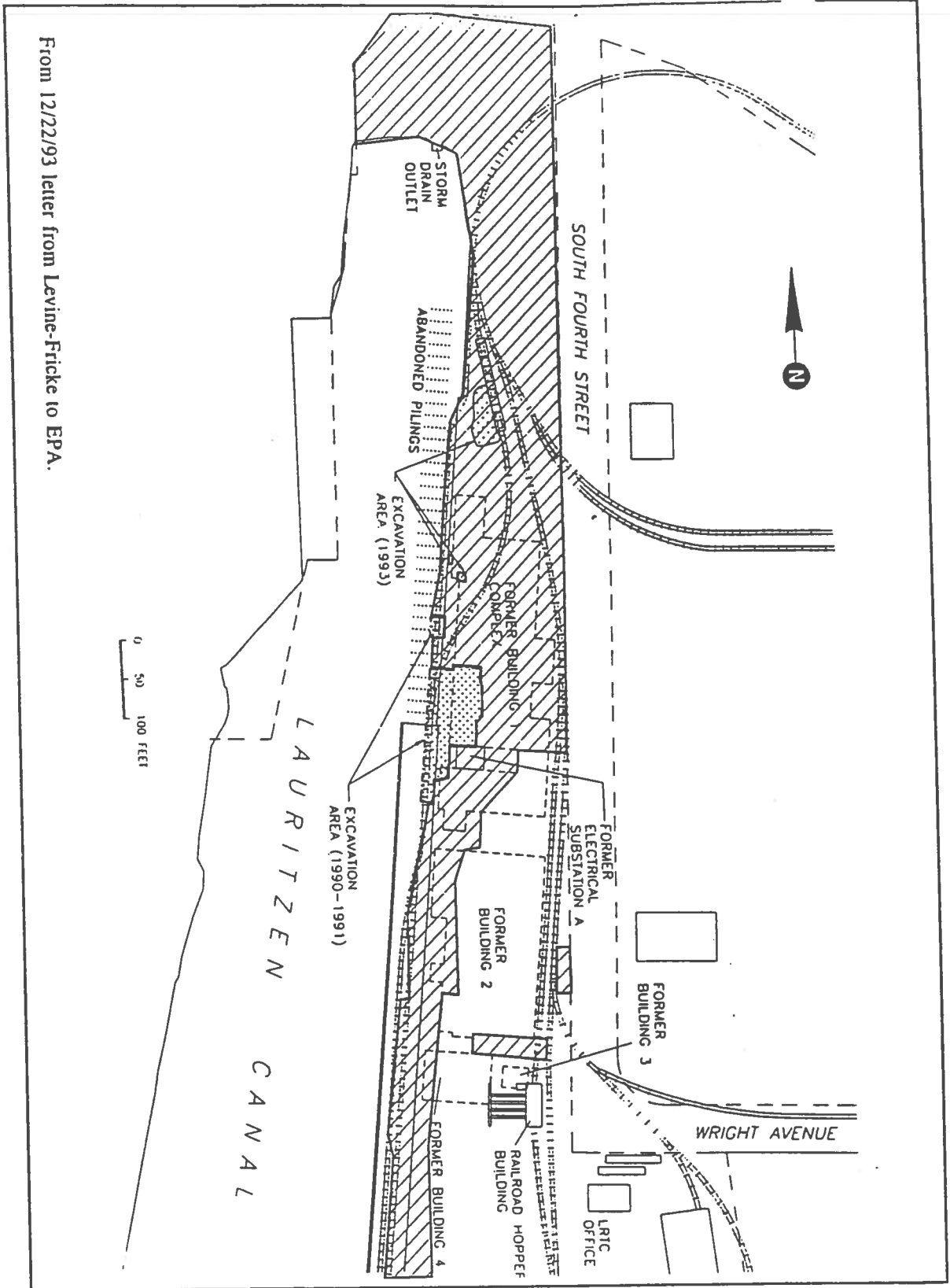


Figure 3. Map of the Lauritzen Channel.



From 12/22/93 letter from Levine-Fricke to EPA.

Figure 4. Upland soils with pesticide concentrations exceeding 1 ppm.

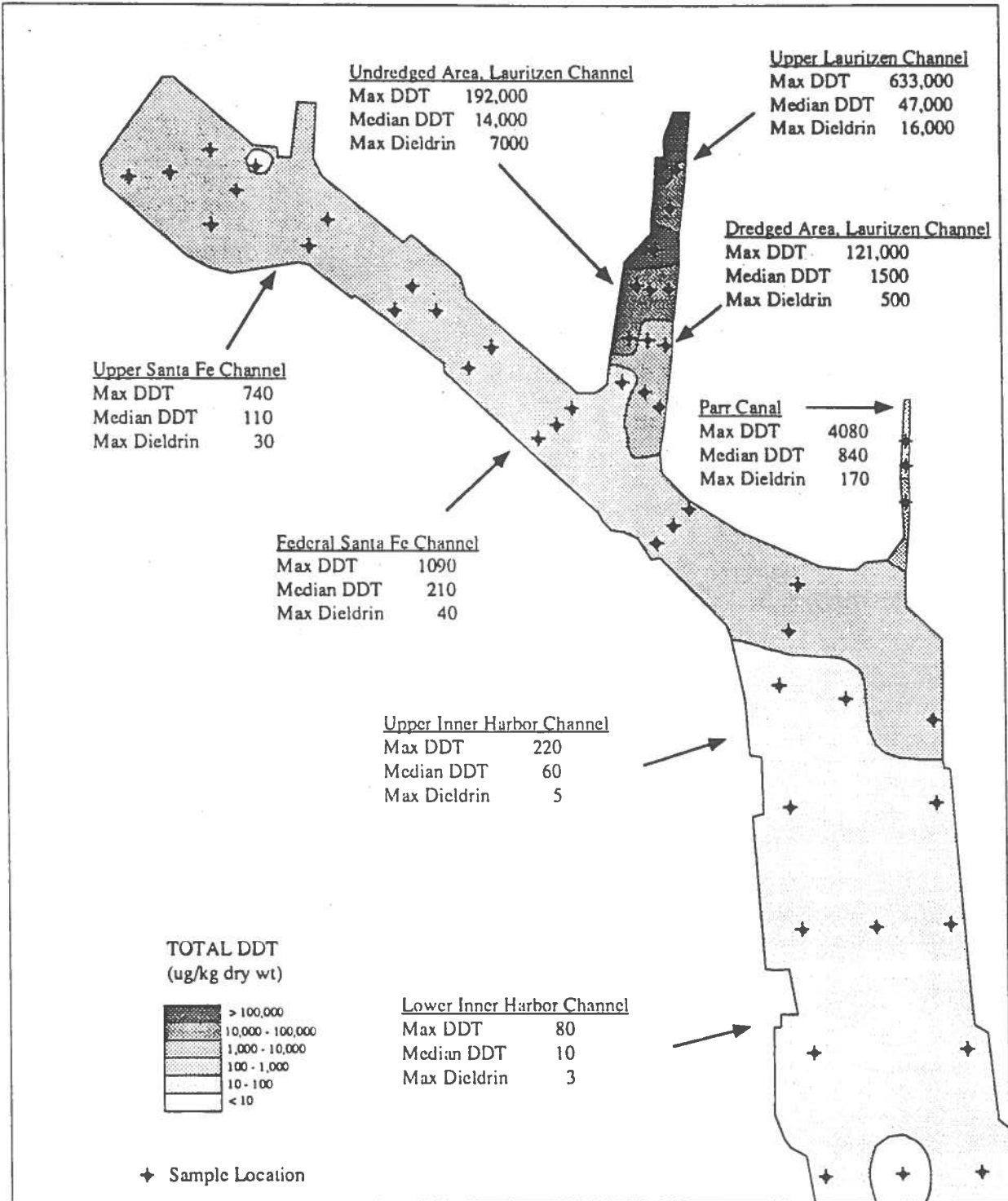
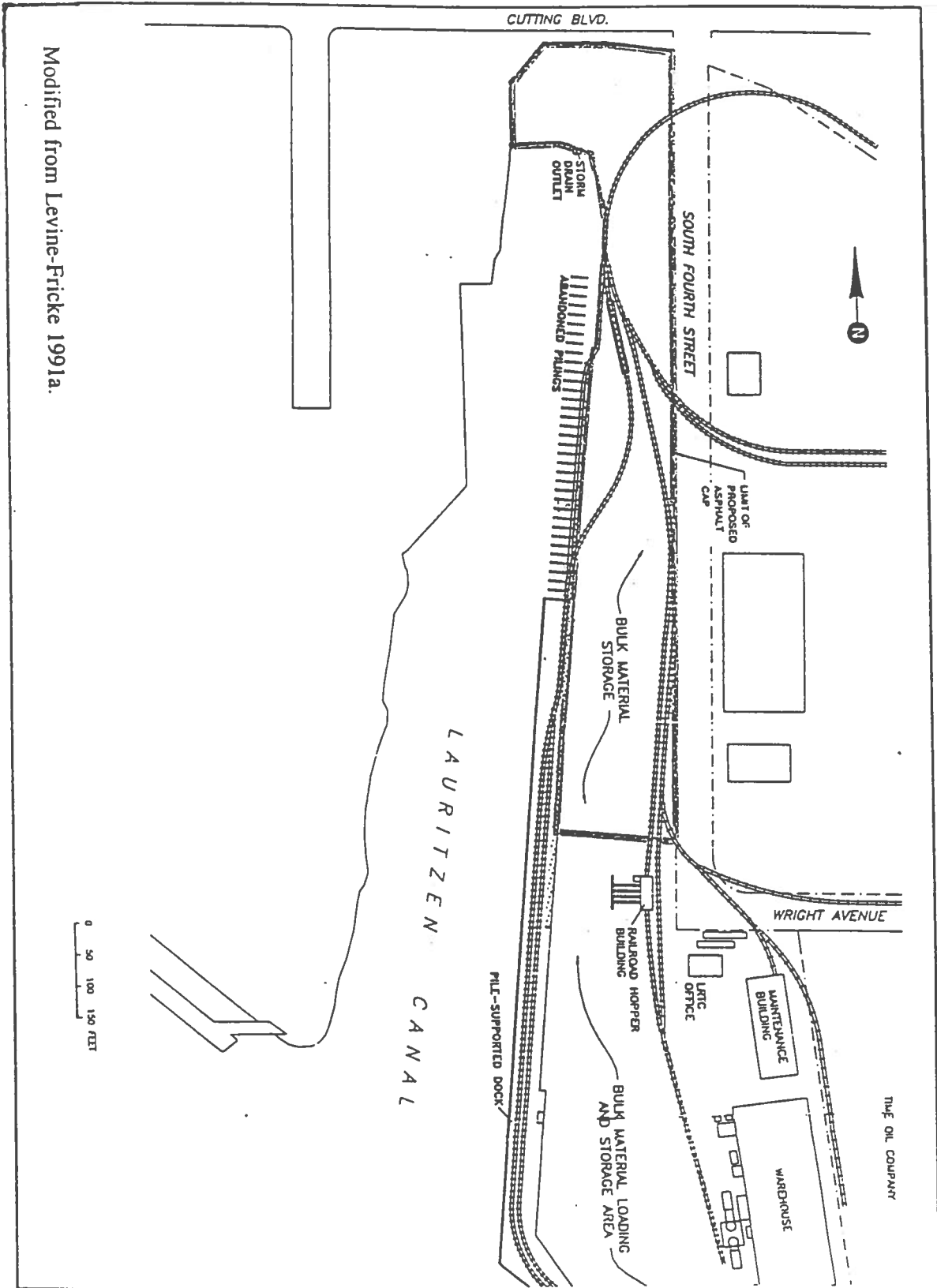


Figure 5. Average total DDT in younger bay mud, Richmond Harbor.



Modified from Levine-Fricke 1991a.

Figure 6. Limit of asphalt cap for upland soils.

RESPONSE TO COMMENTS

United Heckathorn Superfund Site
Richmond, California

October 14, 1994

EPA released the Proposed Plan for the United Heckathorn Superfund Site for public comment on July 15, 1994. The comment period included a 30-day extension which was requested by Potentially Responsible Parties (PRPs). Consequently, the public comment period closed on September 14, 1994.

Three persons made comments at the Public Hearing on August 2, 1994, one of which was also submitted in writing. Six additional written comments on the Proposed Plan were submitted during the comment period. The oral and written comments are addressed below in the order in which they were made. Two additional comments, one on the final human health risk assessment and one on the Feasibility Study, were also received during the comment period. These are discussed after the comments on the Proposed Plan.

EPA reviewed all written comments submitted during the public comment period and all oral comments made at the Public Hearing. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary. However, a minor change has been made in response to comments from the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration. The Proposed Plan included a provision for minor amounts of clean material to be placed in limited areas after dredging. The comments specified that six inches of clean material be placed in dredged areas to promote restoration. The ROD specifies the six-inch layer, and includes a total estimated cost for placement of \$200,000, raising the final remedy cost from the proposed \$6.8 million to \$7 million.

- 1. The Bay Conservation and Development Commission stated that EPA's preferred alternative for remediation "appears to be the most consistent with the Commission's laws and policies [and] best achieves compliance with federal and state environmental laws while ensuring the protection of San Francisco Bay's diverse natural resources, and the health and safety of the surrounding human community." (letter, 7/21/94)*
- 2. The Save San Francisco Bay Association expressed its support for EPA's Proposed Plan, stating that it "is the best way to deal with United Heckathorn's legacy of chemical contamination in the Richmond Harbor. Other proposed alternatives are unacceptable because of the need for bay fill and maintenance." (letter, 7/29/94)*
- 3. The Director of the Port of Richmond spoke at the public hearing and also submitted his comments in writing (8/2/94). Although the Port supports the selected remedy, it is concerned that lower levels of contaminants elsewhere in the harbor may impact disposal options for material dredged for navigation purposes. The Port stated that it would hold EPA responsible for the costs of disposal of any sediments not addressed by the remedy.*

Response: EPA appreciates the Port and the City of Richmond's constructive participation throughout the remedy selection process. Based on the results of the Remedial Investigation and Human Health and Ecological Risk Assessments, EPA concluded that cleanup of those channels

with mean sediment DDT concentrations above 590 ppb is necessary to protect human health and the environment. Channels and private berths outside the cleanup area may still contain sediments with DDT levels below a mean of 590 ppb or with measurable levels of other site-related and/or non site-related contaminants which might affect dredge spoils disposal options. However, based on the results of EPA's RI, HHRA and ERA, contaminant levels in sediment in the Santa Fe Channel and the Inner Richmond Harbor Channel do not pose a significant risk to human health and the environment that would trigger remediation under Superfund. Consequently, EPA in the Record of Decision for the Site has determined that no remedial action is necessary with regard to sediments in the Santa Fe Channel and Inner Richmond Harbor Channel. Under the authority established in CERCLA, particularly in Section 104(a) and Section 121, 42 U.S.C. § 9604(a) and § 9621, EPA is authorized to select remedial actions to protect human health and the environment. EPA is not authorized under CERCLA to make remedial decisions solely to redress economic or property damage that may result or may have resulted from the presence of low levels of hazardous substances or other contaminants. Should the Port incur additional dredge spoil disposal costs because of low level contamination present in the dredged sediment, the City is free to pursue any available legal remedies against parties responsible for the contamination.

4. Mr. Richard Oba, vice president of United Anglers of California spoke at the public meeting and expressed support for EPA's proposed alternative, stating, "we would like to see the job finished."

5. Ms. V. Peters spoke at the public meeting and expressed concern that EPA does not have a community public alert system already in place, stating, "should there be a railway accident, I think you really should have a plan that you can present to the community."

Response: At the time of the public meeting for a Superfund Proposed Plan, EPA has not yet selected the remedy. In this case, of four alternatives considered, three did not involve offsite transportation and disposal of waste. EPA must solicit and consider comments on all alternatives prior to making a final selection.

EPA efforts to inform and involve the community will continue throughout the period of remedial design and remedial action. A health and safety plan will be prepared and made available to the public prior to initiating any action at the site. This plan will address transportation safety and contain procedures to ensure that the dredged sediment is safely contained during transport and that if a spill occurs specific procedures will be implemented to immediately clean up the spill and minimize any risk that the community could come in contact with the spilled sediment. Transportation of the dredged sediment will be conducted by licensed transporters with oversight by EPA acting in cooperation with local and state authorities.

6. Mr. Nicholas Pinette, a resident of Richmond, stated that the preferred offsite disposal alternative makes good sense, but questioned where the dredged material would be transported to for disposal and how it would be stored. (letter, 8/7/94)

Response: EPA has not selected a particular landfill as part of this Record of Decision. The dredged material will be transported to a landfill which is permitted to receive the waste and meets the CERCLA offsite policy which requires EPA to determine that the facility is operating in compliance with all federal and state permits prior to shipment. The choice of landfill will be made by the parties who ultimately perform the remedy, subject to the determination of compliance by EPA. The contaminated sediment currently presents a threat because of its location in the marine environment, which allows direct exposure to sensitive aquatic organisms and bioaccumulation in the food chain. Once it is removed and placed in a landfill it should pose no unacceptable risks to the environment or to human health including that of workers at the disposal site.

7. The Point Richmond Neighborhood Council supported EPA's proposal for offsite disposal stating: "To move this sediment... to any other location within the City of Richmond would be an injustice to the people of the City of Richmond." (letter, 8/10/94)

8. The Montrose Chemical Corporation of California, a DDT manufacturer and Potentially Responsible Party (PRP) at the United Heckathorn Site, submitted extensive comments arguing that the proper remedy for the site is no-action. (letter, 9/13/94)

I. Without risk, no action is necessary.

Response: The contamination at United Heckathorn presents unacceptable threats to human health and the environment. These threats are summarized in Section 7 of the ROD. It should also be noted that two previous PRP-lead site investigations (Harding Lawson, 1986, and Levine-Fricke, 1991) recommended dredging the Lauritzen Channel and concluded that "no action" would not be protective of the environment.

II. EPA's Human Health Risk Assessment (HHRA) fails to demonstrate that DDT or dieldrin in sediments in the Lauritzen Channel or Parr Canal pose any significant threat to human health for the following reasons:

A. The only significant health risk calculated by EPA was for consumption of fish from the Lauritzen Channel. However, EPA has not established that fishing occurs in the Lauritzen Channel, but only in the Santa Fe Channel near the Parr Canal. The Lauritzen Channel is posted to discourage fishing. All available evidence suggests that significant exposure to fish from the Lauritzen Channel does not occur.

Response: EPA risk assessment guidance assumes that institutional controls will not be maintained, or will be ineffective in the long term in eliminating threats to human health. In addition, EPA believes that institutional controls, such as fences and warning signs, cannot be relied upon at this site to prevent fishing in the Lauritzen Channel and Parr Canal. Fish and shellfish in the Lauritzen Channel contain concentrations of DDT and dieldrin which exceed acceptable levels for human consumption. In 1986, CDHS ordered Levin to post warnings around its property, including the eastern shoreline of the Lauritzen to warn boaters about the DDT contamination in fish and shellfish. In 1991, after EPA personnel observed a person fishing from a facility on the shoreline opposite the former Heckathorn location, EPA immediately advised that facility's manager in writing about the State's 1986 health warning. Recently, the State issued a fishing advisory throughout Richmond Harbor. Signs were posted at the popular harbor fishing location near the Parr Canal where there is unrestricted shoreline access. Despite the signs, State personnel report still finding people catching fish for consumption.

B. EPA overestimated the risk from fish consumption by assuming consumption rates of 132 mg/day (sic) for subsistence fishermen and 54 mg/day (sic) for recreational fishermen.

Response: EPA's current risk assessment guidance recommends assuming consumption rates of 54 grams per day (g/day) for recreational fishermen, and 132 g/day for subsistence fishermen. Potential risks were calculated by EPA (see HHRA, Table 5-11) using standard exposure assumptions which included both the 132 g/day subsistence rate, and a much lower rate of 6.5 g/day, which was the rate assumed in the development of EPA's Water Quality Criteria for the protection of human health (1980). These criteria are ARARs at the site. The two consumption scenarios are likely to bracket current and potential future exposures. Calculated risks for consumption of fish from the Lauritzen Channel were unacceptable using either exposure assumption. Risks for consumption of fish from the Santa Fe Channel were within EPA's

acceptable risk range using the low consumption rate, but unacceptable using the subsistence rate. Therefore, EPA concluded that consumption of fish from the Santa Fe Channel may be acceptable. EPA expects that remediation of sediments from the Lauritzen Channel will reduce the concentrations of pesticides in Santa Fe Channel fish as well.

Using the responses from EPA's limited fishing survey, Montrose's consultant, Terra, Inc. (August 17, 1994) calculated a consumption rate of 27 g/day for local fishermen. As stated in the HHRA, EPA's survey was intended only to provide general information on local fishing practices. Even with a much larger survey it would be difficult to accurately quantify current, much less future, consumption rates. For these reasons EPA has included the assumptions discussed above in its risk calculations to ensure that a reasonable maximum exposure scenario is evaluated in order to ensure that EPA actions are fully protective of human health.

C. The risks calculated for fish consumption are also overestimated because they do not account for the effects of cooking. There is no evidence that fishermen eat raw fish. Cooking reduces the concentrations of DDT in fish by 39% to 74%. In addition, absent evidence that whole fish are eaten routinely, EPA should have based its risk calculation on fillets rather than whole fish. EPA guidance states that most humans consume only fillets.

Response: EPA calculated risks for consumption of both whole and filleted fish from the Lauritzen and Richmond Inner Harbor Channels. Risks for fish from the Lauritzen were unacceptable regardless of whether the fish were whole or fillets. A group of recent Laotian immigrants interviewed by EPA stated that they consume raw fish caught in Richmond Harbor. Small fish, such as shiner surf perch, are mashed whole. When fish are filleted, the carcass is also used in the preparation of soup. In order to be protective of diverse ethnic groups known to fish in Richmond Harbor, it is prudent to assume that fish may be eaten raw and that entire fish may be consumed.

The State of California has written fact sheets for fishermen to encourage practices, such as cooking and draining away fat, which will reduce contaminant concentrations. However, even the reductions in concentrations reported by Montrose would be insufficient to make fish from the Lauritzen suitable for consumption (see previous response to this comment, ICF, May 11, 1994).

D. EPA compared fish tissue concentrations with the State of California's Water Quality Objectives which were recently held invalid.

Response: The State of California's Water Quality Objectives for DDT and dieldrin were adopted on April 11, 1991. They were based upon, and are equal to EPA's Ambient Water Quality Criteria, published in 1980. The final HHRA (May, 1994) cited both EPA's criteria, and the equivalent State objectives. EPA's criteria were identified in the July, 1994 Proposed Plan and selected in the ROD as ARARs. It should be noted that although the 1991 State objectives were recently invalidated on procedural grounds, the San Francisco Bay Basin Plan (1986), designated fish and shellfish harvesting and commercial and recreational fishing as beneficial uses of all waters of San Francisco Bay, which supports EPA's determination in the Record of Decision (Section 6) that the federal Ambient Water Quality Criteria are relevant and appropriate ARARs at this site.

E. EPA's HHRA failed to cite epidemiology studies for DDT.

Response: EPA has previously responded to this comment. See final HHRA response to comments, May 11, 1994, pp.8 and 9. In addition, there is currently a great deal of research being performed on DDT and related chemicals regarding their estrogenic effects, links with breast cancer and feminization of males. Appendix 1 of this Response to Comments is a timely news article describing some of this research.

III. EPA's Ecological Risk Assessment of marine sediments (ERA) fails to demonstrate that DDT or dieldrin in sediments in the Lauritzen Channel or Parr Canal pose any significant threat to the environment health for the following reasons:

A. In identifying chemicals of concern, EPA improperly excluded from consideration chemical and physical stressors such as PAHs, PCBs, shipping disturbance and industrial activity.

Response: Physical stressors, such as shipping disturbance, were discussed and considered in the ERA, but they are neither site-related, nor are such stressors chemicals and so cannot be identified as "chemicals of concern." Non site-related chemicals, including PAHs and PCBs were also discussed and considered in the ERA. Although PAHs and PCBs are present in Richmond Harbor, they are not consistently elevated above effects thresholds or background concentrations for San Francisco Bay. By contrast, DDT concentrations in sediments in the Lauritzen Channel are on average 10,000 times higher than the San Francisco Bay background level. These facts are graphically illustrated in Figures 8, 9 and 10 of NOAA's March, 1992 evaluation of chemical contaminants in San Francisco Bay, (Technical Memorandum NOS ORCA 64) which are attached as Appendix 2 of this Response to Comments. In viewing Figure 8, it should be noted that if the vertical bar representing the concentration of DDT in the Lauritzen was drawn to the same scale as the bars representing the concentrations of DDT found elsewhere in San Francisco Bay, it would be 2,715 feet, or over a half-mile, high.

B. EPA has not shown that fish-eating birds are exposed to significant, if any amounts of DDT in the Richmond Inner Harbor. EPA did not analyze any birds or provide dose-response data for individual species. Birds are not feeding in Richmond Harbor. If fish-eating birds are not exposed, the elementary conclusion is that they are not at risk. Andrew Lincoff, Remedial Project Manager stated in a letter dated July 31, 1992 that brown pelicans only feed occasionally in Richmond Harbor.

Response: The US Fish and Wildlife Service (USFWS), which is the federal trustee for avian resources, provided EPA with a list of over 70 species of "birds known to nest in central or northern San Francisco Bay or likely to regularly feed in the immediate vicinity of Richmond Harbor." (EPA, 1994, Table 4-1). While engaged in site investigations, removal actions and other activities at the site, EPA personnel and contractors observed that numerous fish-eating birds including cormorants, western grebes, kingfishers, loons, and California brown pelicans, an endangered species, commonly feed throughout the Richmond Inner Harbor, including the Lauritzen Channel.

The Project Manager's 1992 statement that brown pelicans may only occasionally feed in the harbor was made based on the assertion in a previous PRP Remedial Investigation Report (Levine-Fricke, 1990) that no endangered species had been seen in the vicinity of the site. However, since EPA began working at the site, endangered brown pelicans have been seen commonly in the Inner Richmond Harbor. In response to repeated unsupported claims by Montrose and its consultants that birds would not be found in an industrialized harbor, EPA, with minimal effort (EPA memoranda 12/8/93 and 12/16/93), was able to observe and photograph numerous species of birds in the harbor, including an additional species of shorebird which had not been listed by USFWS. These photographs also include a group of endangered brown pelicans which were feeding at the confluence of the Lauritzen and Santa Fe Channels, and document a brown pelican in the act of plunge-diving for fish at the same location.

It is not subject to any reasonable doubt that DDT in Richmond Harbor accumulates in the food chain and that predatory birds are being exposed. In a 1985 study (Ohlendorf, 1991) the concentration of DDE (a metabolite of DDT) in surf scoters, a migratory shellfish-eating bird which winters in San Francisco Bay, was measured in 39 birds shot in January and compared with the

concentrations in 40 shot in March. The body burdens of birds wintering in Richmond Harbor increased by over four-fold in three months, clearly demonstrating that even birds which feed for only part of the year in and near the harbor can have significant bioaccumulation. No significant increases in concentration occurred in birds which wintered elsewhere in San Francisco Bay.

It is outside the scope of the EPA ecological risk assessment process to conduct new studies to determine dose response information for birds species present at the site. Furthermore, studies of higher organisms, especially birds, are not necessary because criteria are available for their protection (EPA's Ambient Water Quality Criteria and California's Water Quality Objectives) which are based upon achieving much more easily measurable contaminant concentrations in fish and the water column. The primary field sampling for EPA's United Heckathorn ecological assessment took only six days. As discussed in the assessment (Chapter 5), "studies of more mobile species, particularly migratory birds, would require much more effort and would be subject to inherently higher uncertainty regarding pollutant sources and effects than the study of sessile and relatively non-mobile organisms chosen here."

EPA assessed the risks posed by DDT to fish-eating birds using two published criteria for the protection of birds which are based upon contaminant concentrations in fish. EPA's marine chronic Ambient Water Quality Criteria for DDT (1980), which is an ARAR, is based upon a fish tissue residue of 150 ppb. This concentration is a Lowest Observed Adverse Effect Level at which reproduction in California brown pelicans was reduced to a level below that necessary to sustain a stable population. The more protective National Academy of Sciences (NAS) action level for the protection of fish-eating birds is 50 ppb (published by EPA in 1973). The concentration of DDT in fish caught in the Lauritzen Channel is over two orders-of-magnitude (100 times) higher than the NAS level. In the ERA, (Figure 9-19) EPA estimated that if a bird consumed prey from the Lauritzen for more than about one day per year, its annual average diet would exceed the NAS action level. At more than three days per year, it would exceed the level at which reproduction is reduced in pelicans. These calculations may well underestimate risk for a number of reasons, including the fact that they assume that the bird is exposed to no other source of DDT. California brown pelicans, for example, migrate during non-breeding months from nesting areas in southern California (US Department of the Interior, Final Report: California Seabird Ecology Study, MMS 87-0055) where they may be exposed to DDT contaminated prey while feeding in the southern California bight: an area still heavily contaminated from the historic discharges of PRP Montrose's former Torrance, California DDT manufacturing plant.

EPA did not report dose-response data for all species of birds likely to feed in Richmond Harbor because such data does not exist. Dose-response data is available for only a few species of wild birds, including American kestrels, mallard ducks, and a bird which does feed in the most contaminated channels in Richmond Harbor - the California brown pelican. Available effects data is routinely used in developing criteria for the protection of other aquatic organisms and wildlife. Recently, for example, the same effects data discussed above for California brown pelicans were used as the basis of the proposed Wildlife Criteria for DDT to protect fish-eating birds in the Great Lakes (58 FR 20802, April 16, 1993).

C. The ERA fails to demonstrate that sediment-contained DDT or dieldrin pose any significant risk to benthic invertebrates. The diversity indices for the benthic community structure and number of mollusks actually increase with concentrations of DDT. The poorest community structure was observed at locations with the lowest concentrations of DDT. The predominant effect on benthic community structure is shipping disturbance which the ERA fails to consider as a stressor.

Response: There is ample evidence that DDT contamination in the Lauritzen Channel poses a significant risk to benthic invertebrates. Invertebrate toxicity tests conducted during the ERA indicated that Lauritzen Channel sediments are among the most toxic ever tested by the EPA personnel who developed the standard methods for sediment toxicity tests which are used worldwide. The extraordinarily high levels of DDT were determined in the ERA to be the primary cause of toxicity in the Lauritzen. Additional invertebrate toxicity tests conducted during the RI (Battelle, 1994) found no survival of test organisms throughout most of the Lauritzen Channel.

Although disturbances relating to shipping (including dredging to maintain required depths for navigation and propeller wash from ships) can remove or displace benthic organisms, it does not follow that chemical contamination of the benthos is acceptable. The Richmond Harbor federal channel is dredged annually to maintain a 35 ft navigation depth. The federal channel runs from Point Potrero up the Richmond Inner Harbor and lower Santa Fe Channels, but does not enter the Lauritzen Channel. There is one shipping berth at the mouth of the Lauritzen, which PRP Levin has been unable to dredge since 1985 because of the DDT contamination. Large ships cannot enter the shallower northern Lauritzen Channel which is not maintenance dredged. Absent the very high levels of DDT in the Lauritzen one would expect, based on shipping and dredging history, to find healthy benthic communities there and poorer communities in the navigation channels.

The diversity, number and biomass of mollusks are in fact lower in the shipping channels and increase in the northern Lauritzen, as would be expected from the dredging and shipping history, and the fact that mollusks are known to be insensitive to DDT. The number of amphipods, on the other hand, is opposite of what would be expected from dredging and shipping disturbances, and declines in the Lauritzen Channel because of the DDT (EPA, 1994). Amphipods are crustaceans, which are known to be sensitive to DDT. In the development of the federal water quality criteria for DDT (EPA, 1980), a crustacean was found to be the most sensitive marine aquatic organism. The sensitivity of crustaceans to DDT may be explained by their phylogenetic affinity with insects (both are in the phylum Arthropoda, and DDT's purpose was to eradicate insects). An overall measure of benthic community structure is the Infaunal Index, which is a composite measure of the abundance of pollutant-sensitive and pollutant-tolerant taxa. The Infaunal Index declines significantly as DDT concentrations increase in Richmond Harbor.

Finally, it should be emphasized that even though some taxa, such as mollusks, can survive in areas like the Lauritzen which are heavily contaminated with DDT this does not mean that there is no biological effect resulting from their exposure. The California State Mussel Watch found that by far the highest levels of DDT bioaccumulation in the State occur in the Lauritzen. Bioaccumulated contaminants can move up the food chain and affect animals at higher trophic levels. The levels of DDT in benthic invertebrates, like those in fish, are far above the dietary levels which may cause reproductive impacts to birds.

D. The ERA fails to provide the required uncertainty analysis.

Response: Uncertainties relating to a myriad of factors are discussed throughout the ERA, consistent with EPA guidance. Those study results and conclusions about which there is the least uncertainty are listed in the executive summary.

E. The ERA offers no evidence that fish are being affected by DDT or dieldrin.

Response: EPA's 1980 Ambient Water Quality Criteria document for DDT reported that levels of 3 to 6.25 ppm DDT caused reduced survival in the fry of fish tested. The average concentration of fish caught in the Lauritzen is above these levels. Therefore one of the conclusions of the ERA was that the concentrations of DDT in the Lauritzen "may also cause direct chronic effects such as

reduced fry survival in fish." Montrose's complaint stems from the fact that the fish caught in the Lauritzen (mostly shiner surf perch) are not the same species as those which have been used in research. In order to determine the level of DDT which causes reduced fry survival in shiner perch, it would be necessary to start a research project, which, as Montrose also points out, is not the purpose of ecological assessments. The ERA reported numerous species of fish potentially affected by the contamination in Richmond Harbor. Since one cannot assume that the few species which have been tested are likely to be the most sensitive to the toxic effects of DDT, it would be prudent to divide the values for tested species by a factor of 10 or more to account for the uncertainty in extrapolating toxicity data from test species to those fish found in Richmond Harbor. Using this approach, one would conclude that fish in the Santa Fe Channel as well as the Lauritzen may suffer chronic impacts from current levels of DDT contamination.

F. National Academy of Sciences (NAS) action levels should not be used to demonstrate risk in an ecological assessment because they're not ARARs and do not even qualify as to-be-considered material because NAS is not a state or federal agency. NAS action levels only assume that effects will occur, EPA has not demonstrated that actual effects have occurred. EPA failed to follow NAS sampling recommendations and should have sampled fish from a variety of locations throughout known foraging ranges.

Response: The National Academy of Sciences action levels were published by EPA as 1972 Water Quality Criteria. The criteria for DDT states:

"It is recommended that DDT concentrations in any sample consisting of a homogenate of 25 or more fish of any species that is consumed by fish eating birds and mammals, within the same size range as the fish consumed by any bird or mammal, be no greater than 50 $\mu\text{g}/\text{kg}$ of the wet weight."

EPA analyzed a total of 23 shiner surf perch from the Lauritzen Channel in the ERA and in support of the HHRA. The average concentration was 9,200 $\mu\text{g}/\text{kg}$ (wet weight), which is over 180 times the NAS action level. Assuming that the two additional fish needed for a sample of 25 contained no DDT, the average would still be 170 times the action level. Looked at another way, even if sufficient time and resources were spent to determine the foraging ranges of the various species of fish-eating birds which feed in Richmond Harbor and to sample fish throughout those ranges, the concentration of DDT in the Lauritzen Channel is so high that a single fish would cause a homogenate of 25 or even 170 fish of equal size to exceed the action level, even if the all of the fish in the rest of the foraging range contained no DDT at all.

In regard to the assertion that the NAS action level only *assumes* that damage will occur from DDT exposure, Montrose, a DDT manufacturer, should recall that DDT was responsible for great reductions in populations of predatory birds over vast areas and the almost complete extirpation of some species. The California brown pelican is endangered because of exposure to DDT (EPA, 1994).

In regard to EPA's not sampling birds or documenting actual damage in this study, it should also be remembered (in addition to the responses to this issue in previous comments) that the purpose of risk assessments is to evaluate risk, not to document or quantify damage. There is ample evidence that the high levels of DDT in Richmond Harbor threaten a variety of ecological receptors at various trophic levels including benthic and water column organisms and fish-eating birds. The benthic community structure analyses in fact are evidence of damage. EPA guidance recommends that when criteria exist, ecological assessments should include monitoring to determine the extent to which those criteria are exceeded by the environmental concentrations at the site. EPA has done this with the NAS action levels.

III. In the absence of risk, ARARs are irrelevant. EPA's Water Quality Criteria are not ARARs because they are not promulgated. CERCLA § 121(d)(2) states that EPA criteria may be relevant and appropriate considering "the designated or potential use of the surface or groundwater, the environmental media affected, the purposes for which such criteria were developed, and the latest information available." Since the criteria for DDT was set to protect fish-eating birds, and birds are not feeding in the Richmond Inner Harbor the "potential use" of the surface water and the "environmental media affected" do not warrant application of the criteria.

Response: Risks to human health and the environment have been discussed at length above. Section 121(d)(2)(A)(ii) of CERCLA requires that remedial actions meet federal Water Quality Criteria established under Section 304 or 303 of the Clean Water Act where such WQC are determined by EPA to be relevant and appropriate to remedial actions at the site. See 42 U.S.C. § 9621(d)(2)(A)(ii) and 40 C.F.R. § 300.430(e)(2)(i)(G). In evaluating whether specific WQC are relevant and appropriate to remedial actions at Superfund site, CERCLA requires EPA to consider four criteria: 1. the uses of the receiving water body; 2) the media affected; 3) the purposes of the criteria and 4) current information. See 42 U.S.C. § 9621(d)(B)(i). See also U.S. EPA, CERCLA Compliance with Other Laws Manual - CERCLA Compliance with the CWA and SDWA (OSWER Pub. 9234.2-06/FS, Feb. 1990).

EPA guidance concerning determinations that WQC are relevant and appropriate to remedial action at a Superfund site provides that:

A water quality criteria component for aquatic life may be relevant and appropriate when there are environmental factors that are being considered at a site, such as protection of aquatic organisms. With respect to the use of water quality criteria for the protection of human health, levels are provided for exposure both from drinking the water and from consuming aquatic organisms (primarily fish) and from fish consumption alone. Whether a water quality criterion is appropriate depends on the likely routes of exposure.

U.S. EPA, CERCLA Compliance With Other Laws Manual: Interim Final at 1-15 (EPA 540-G-89-006, Aug. 1989).

Both the marine chronic and human health WQC for DDT and dieldrin are relevant and appropriate to remedial actions at this site since both aquatic and wildlife and humans may be exposed to these contaminants either directly or through consumption of contaminated organisms. As discussed in the Ecological Risk Assessment, aquatic organisms are present in all channels at the site, which are a part of San Francisco Bay. Fish eating-birds feed in all channels in the harbor. In fact, the particular bird upon which the marine chronic water quality criterion for DDT was based is the California brown pelican, an endangered species, which has been observed feeding in the most contaminated channels at the site. As discussed in the Human Health Risk Assessment, fishermen catch and consume fish from the Inner Richmond Harbor channels. In 1986, the State of California Department of Health Services ordered the posting of the Lauritzen Channel to warn fishermen of the fish and shellfish contamination. On April 7, 1994, the Cal-EPA Department of Toxic Substances Control issued an advisory against consuming any resident bottom fish, such as white croaker, from anywhere in the Inner Richmond Harbor.

The beneficial uses designated by the State of California for central San Francisco Bay waters, which are listed in Section 6 of the Record of Decision, include fishing, wildlife habitat, preservation of rare and endangered species, fish migration, fish spawning, shellfish harvesting, and estuarine habitat. EPA's Ambient Water Quality Criteria were specifically developed to protect such beneficial uses.

IV. Background risks to human health and the environment from other stressors exceed the purported risks associated with DDT and dieldrin. The human health risk associated with PCBs found in fish exceed the risks of DDT and dieldrin. Other environmental stressors, including PAHs, PCBs and shipping disturbance are relevant to evaluating the long-term effectiveness of the chosen remedy. If the remedy will not reduce existing risk then it should be rejected in favor of no action.

Response: Both natural and anthropogenic background risks are common at Superfund sites and EPA guidance (EPA/540/1-89/002) states that they may be eliminated from risk assessments. The guidance also allows, however, that they may be considered separately in order to provide information to those potentially exposed. This was done for PCBs in the United Heckathorn risk assessment. As a result of EPA's sampling and risk analysis, the California Department of Health Services conducted a further study of fishing in Richmond Harbor and recently issued an advisory for the entire harbor based on both the Heckathorn contaminants and PCBs.

Recent research suggests PCBs may be present in the water throughout San Francisco Bay. EPA's fish sampling found that PCB mixture Aroclor 1254 is present in fish in Richmond Harbor. There is no cancer potency data available for Aroclor 1254. Therefore risks associated with PCBs were calculated using the potency factor for Aroclor 1260 which likely has higher potency. The human health risks associated with PCBs in fish from Richmond Harbor may be overstated for this reason alone. In addition, absent the distinction between Aroclors 1254 and 1260, Montrose's consultant Terra, Inc. stated that it had independently derived a potency factor for PCBs which indicated that human health risks from PCBs were overstated by "1-2 orders of magnitude." Nevertheless, the human health risk assessment still found that the risks calculated for the sum of site-related chemicals of concern (DDT and dieldrin) in the Lauritzen Channel were 2 to 3 times the risk for PCBs (ICF, 1994, Table 5-11). It should also be noted that fish in the Lauritzen exceed the Food and Drug Administration Action Levels for DDT and dieldrin, but not for PCBs. In the Santa Fe Channel, the calculations indicate that PCBs become a greater human health risk than site contaminants, but again the risk from PCBs may be overestimated.

The selected remedy will remove contaminated sediments from the Lauritzen Channel and Parr Canal and reduce human health risks from DDT and dieldrin exposure throughout Richmond Harbor. The sediments to be remediated also contain non site-related chemicals, including PCBs, although the levels of these contaminants relative to bay background concentrations is minute compared to the relative levels of DDT (see Appendix 2). Nevertheless, since the remedy will result in the removal of PCBs from portions of Richmond Harbor, there may be a reduction in human health risk associated with PCBs as well.

Other environmental stressors have been discussed in previous responses. DDT is the primary cause of toxicity in the Lauritzen Channel, and existing threats to benthos, water column organisms, and fish-eating birds are expected to be eliminated by the selected remedy.

V. Selection of the No-Action alternative is consistent with CERCLA, the NCP, and EPA guidance.

Response: EPA disagrees. As discussed in the Record of Decision, the no-action alternative fails to meet the NCP's threshold criteria for remedy selection. In addition, as mentioned previously, it should be noted that two previous PRP-lead site investigations (Harding Lawson, 1986, and Levine-Fricke, 1991) also recommended dredging the Lauritzen Channel and concluded that "no action" would not be protective of the environment.

9. The National Oceanic and Atmospheric Administration (NOAA), which is the federal trustee for marine resources, submitted comments (September 14, 1994) supporting EPA's proposed plan. NOAA also recommended: 1) not dredging during the Pacific herring spawning season (December 1 to March 1); 2) the evaluation of dredging techniques to minimize resuspension and avoid spillage during transportation; 3) various types of remedial and post-remedial monitoring, and; 4) the placement of approximately six inches of clean material over dredged areas to help restore the area immediately after implementation of the remedy. (letter, 9/14/94)

Response: EPA appreciates the information provided by NOAA and will ensure that the remedy is not implemented between December 1 and March 1. The detailed selection of dredging and monitoring techniques will be made during the remedial design phase and EPA looks forward to NOAA's participation in that process.

Several commenters before and during the comment period recommended the placement of clean material as part of the remedy. Morrison-Knudsen, consultant to Montrose, recommended the placement of clean material in areas, such as those with rip-rap, in which dredging would be impractical or of limited effectiveness. USFWS (see comment 10, below) recommended placement of clean material after remediation to bury any remaining contaminants and help restore habitat.

The Proposed Plan stated: "Minor capping, which would not significantly alter the existing depths of water, might also be used if determined to be necessary during the remedial design or remedial action phases," although a cost for this activity was not estimated. EPA has contacted Manson Construction, which provided estimates of dredging costs used in the Feasibility Study. Assuming that the total area of the Lauritzen Channel and Parr Canal is 50,000 square yards, a six-inch layer would require approximately 8000 cubic yards of clean material. Manson indicated that the cost of placement is relatively high, and estimated \$25 per yard total. A six-inch layer of clean material would therefore cost approximately \$200,000. This cost has been added to the estimate for the final remedy, bringing the total estimate to \$7 million. There may also be an opportunity to save costs and obtain appropriately sized clean dredged material from the Richmond Harbor deepening project.

Other Comments

10. The US Fish and Wildlife Service submitted comments, dated August 15, 1994, on the FS. USFWS supported EPA's preferred alternative, and made the following recommendations: 1) removal of the upper layer of old bay mud to ensure that median DDT levels are below a deleterious effects range; 2) placement of a clean layer of fill after dredging (discussed in comment 9, above), and; 3) hazing to prevent seabirds from entering the dredging area during remediation. (letter, 8/15/94)

Response: The placement of clean fill after dredging has been discussed above. Additional recommendations regarding activities during remediation will be considered in the remedial design phase, in which USFWS is encouraged to participate. The proposed remedy including dredging of all soft sediments down to the Old Bay Mud contact. In practice, this will result in the removal of the top layer of old bay mud. Sampling conducted during the RI indicates that the medial concentration of contaminants in the upper layer of old bay mud is well below the range which may be deleterious to benthic organisms.

11. Montrose also submitted comments dated August 17, 1994 from its contractor, Terra Inc., on the final human health risk assessment. With the exception of the following comment, Terra's comments were either repeated in Montrose's comments on the proposed plan, discussed above, or were responded to in earlier responses to comments on the draft human health risk assessment. Exposure point concentrations were improperly estimated for upland soils resulting in the overestimation of risk. Due to its overstatement of risk, the final risk assessment cannot be reliably used to develop remedial alternatives or to determine whether there is any necessity to remediate surface soils.

Response: This comment ignores both the conclusions of the risk assessment and EPA's proposed remediation. The EPA human health risk assessment clearly states that conservative estimates were used, and that risks due to exposure to contaminants in upland soils are within EPA's acceptable risk range even using these conservative estimates. EPA has proposed no further remediation to reduce the concentrations of contaminants in site soils. Therefore, the entire discussion of whether the risk estimates for soils are overly conservative is moot.

Two tables in the final risk assessment (Tables 3-2 and 3-3) did in fact contain typographical errors. Corrected tables enclosed with a memo from ICF are provided as Appendix 3 of this Response to Comments. Because none of the risk calculations contained in the assessment were derived from the erroneous values, the errors had no effect on the final conclusions.

United Heckathorn Response to Comments

Appendix 1

**San Francisco Chronicle, October 4, 1994
p. A9**

Clue in Pesticide Link to Breast Cancer

Exposure to some poisons raises level of 'bad' estrogen

Associated Press

New York

Researchers trying to explain the disturbing link between pesticides and breast cancer have discovered that pesticides appear to raise levels of a harmful form of estrogen.

The finding comes as a surprise to the director of the research, who undertook the study expecting to show that pesticides had no effect on estrogen.

"I was wrong," said H. Leon Bradlow, a biochemist with the Strang Cancer Prevention Center at Cornell University Medical School. The study showed that after exposure to pesticides, "your risk ratio is greater than what it was before," Bradlow said yesterday.

Several earlier studies have linked pesticides to an increased

risk of breast cancer, although one study failed to find a link. The new study shows how pesticides may be exerting a harmful effect, Bradlow said.

Penelope Fenner-Crisp, a pharmacologist and pesticide specialist with the Environmental Protection Agency, said the EPA is taking the link between pesticides and hormones very seriously. "We should think about how we might go about encouraging exposure reduction," she said.

The study, which will be published soon in *Environmental Health Perspectives*, a journal of the National Institute of Environmental Health Sciences, builds on Bradlow's previous research showing that there is a "good estrogen" that protects against breast cancer and a "bad estrogen" that is associated with increased risk of the disease.

The researchers exposed human breast cells in the test tube to DDT and other chlorine-containing pesticides. They found that the pesticides' effect on bad estrogen was three to four times as great as that of a known human carcinogen that was used as a comparison.

In a separate study, Bradlow and his colleagues found that women who eat "cruciferous" vegetables — broccoli, cauliflower, brussels sprouts and cabbage — appear to counteract the harmful effects of pesticides. An anti-cancer substance found in these vegetables called indole-3-carbinol was found to increase the ratio of good estrogen to bad estrogen.

Bradlow said a woman who eats such vegetables regularly could significantly reduce her risk of breast cancer, although he cannot yet say precisely how much lower the risk would be.

United Heckathorn Response to Comments

Appendix 2

**NOAA Technical Memorandum NOS ORCA 64
Figures 8, 9 and 10**

NOAA Technical Memorandum NOS ORCA 64



**AN EVALUATION OF THE EXTENT AND MAGNITUDE OF
BIOLOGICAL EFFECTS ASSOCIATED WITH CHEMICAL
CONTAMINANTS IN SAN FRANCISCO BAY, CALIFORNIA**

Seattle, Washington
March 1992

noaa

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

National Ocean Service

DDT
San Francisco Bay Region

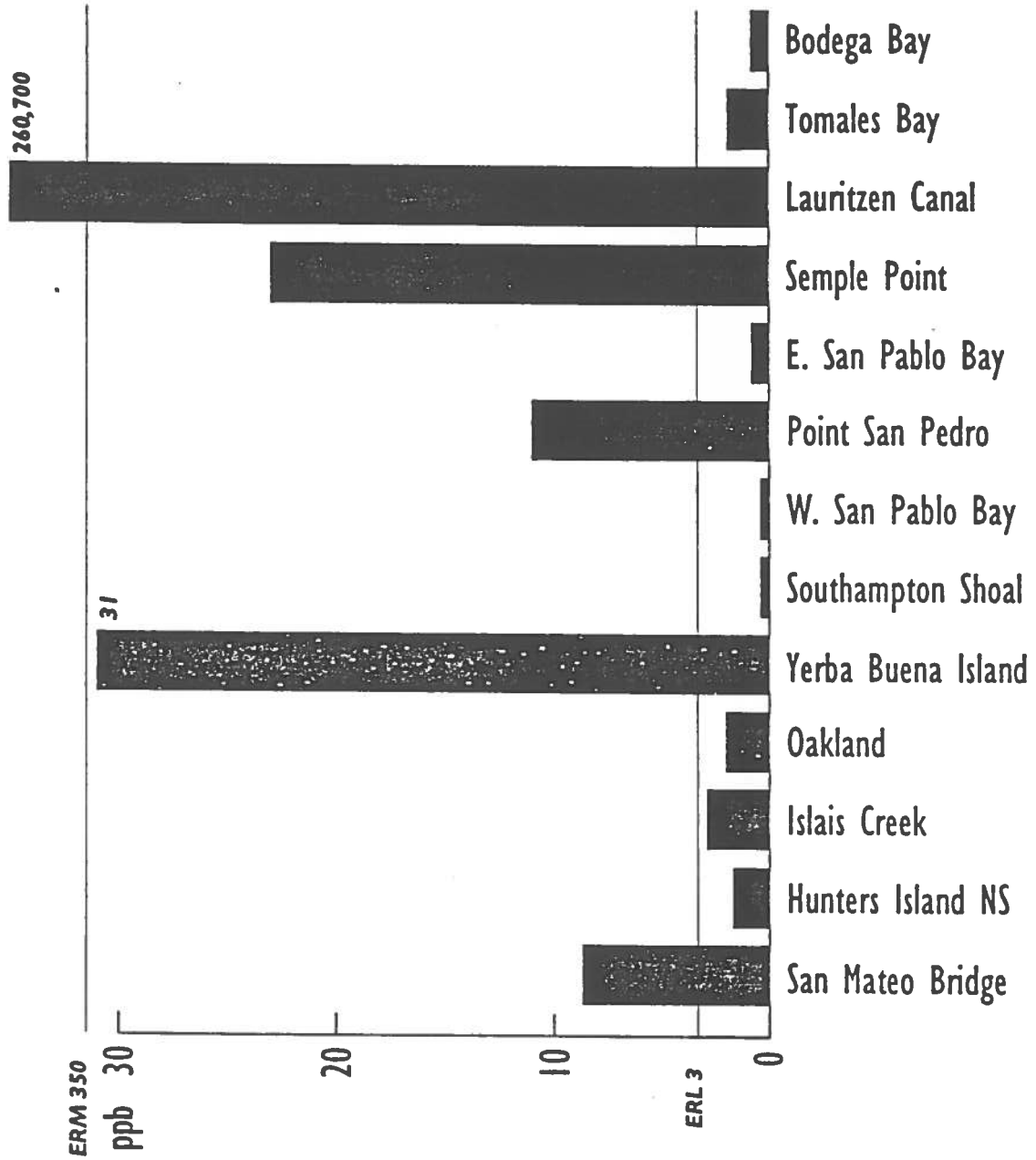


Figure 8. Mean tDDT concentrations at specific sampling sites in San Francisco Bay (from Long et al., 1988) and ERM and ERL values for tDDT (from Long and Morgan, 1990).

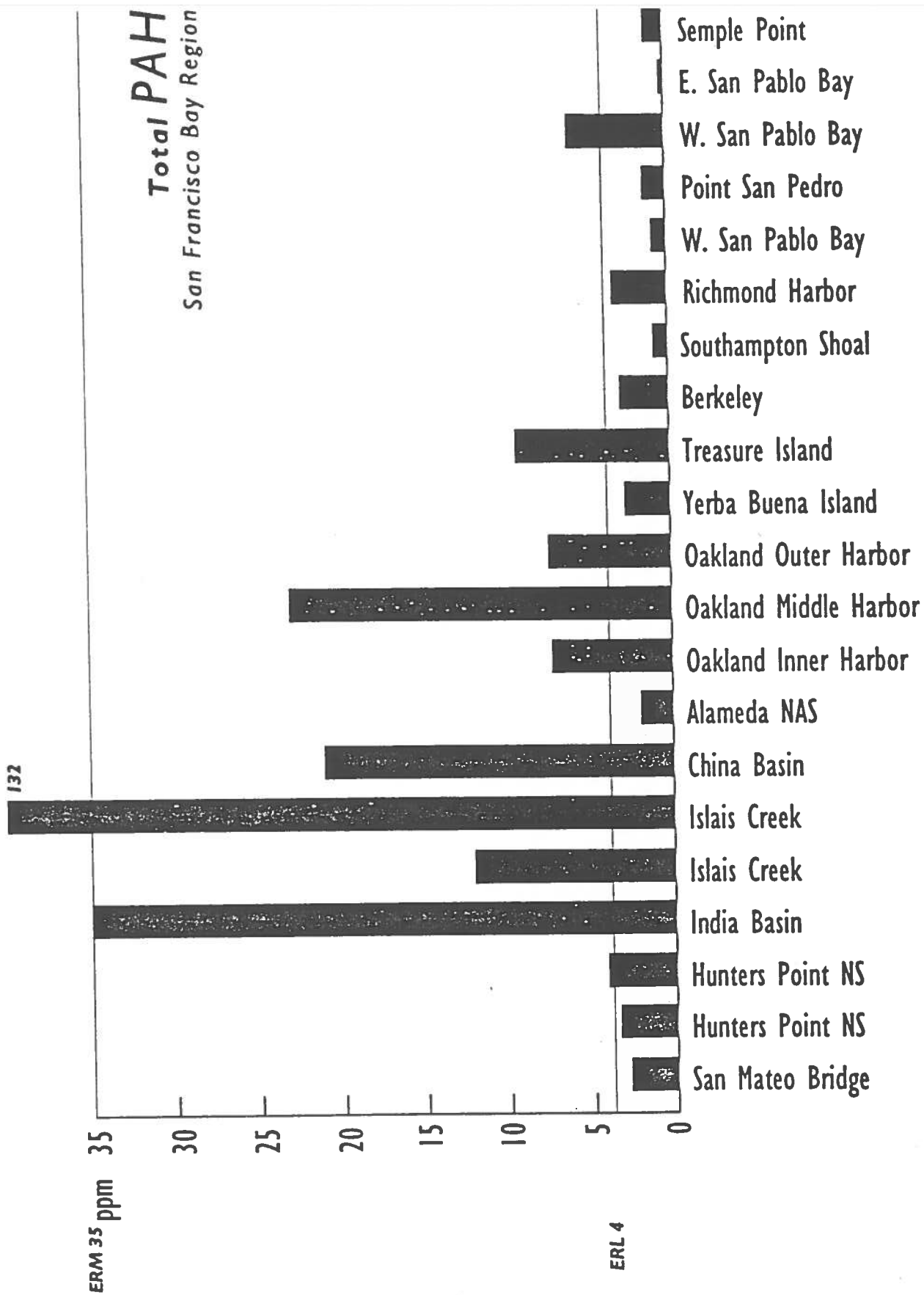


Figure 9. Mean tPAH concentrations (sum of 18 compounds) at specific sampling sites in San Francisco Bay (from Long et al., 1988) and ERL and ERM values for tPAH (from Long and Morgan, 1990).

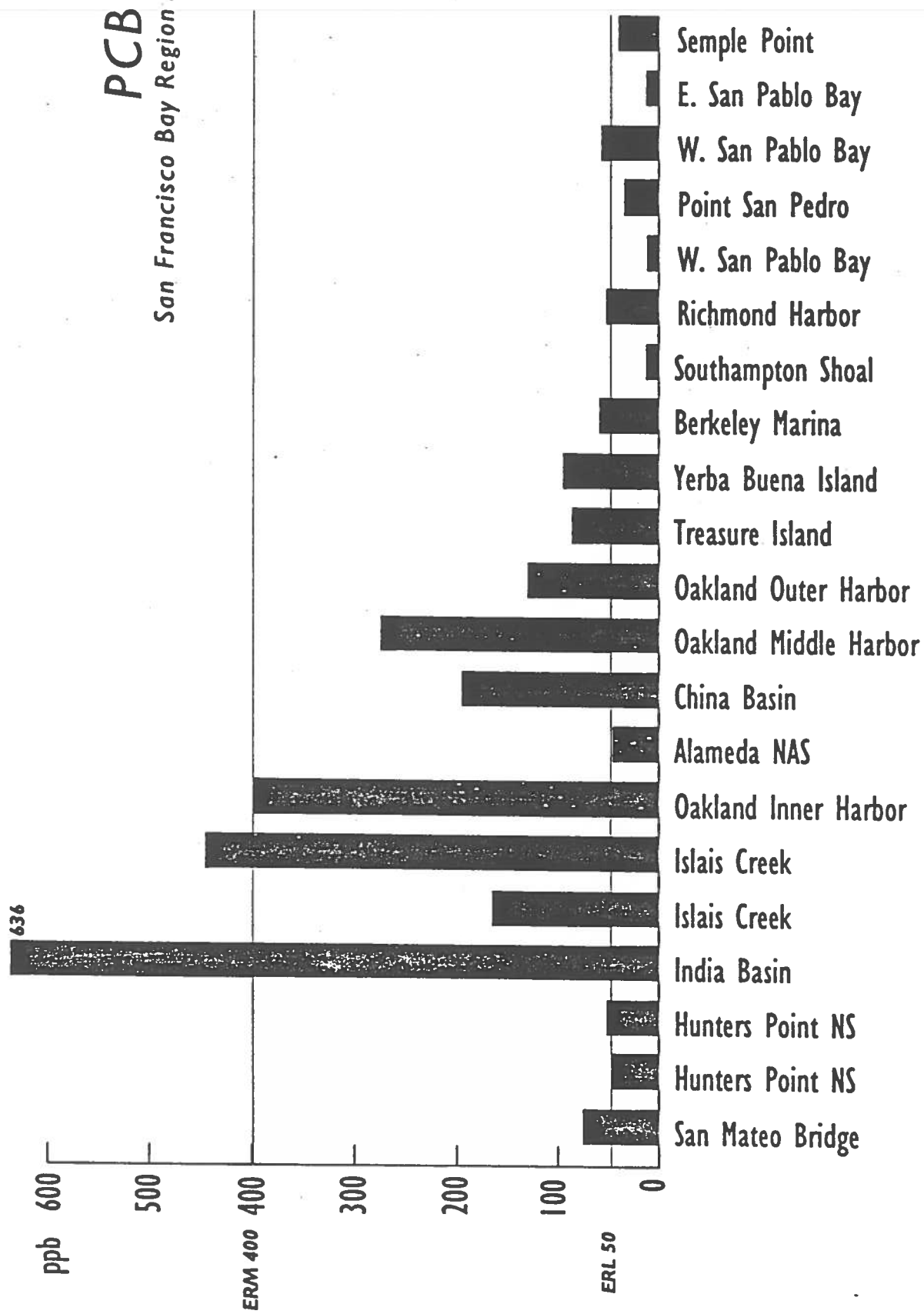


Figure 10. Mean tPCB concentrations at specific sampling sites in San Francisco Bay (from Long et al., 1988) and ERL and ERM values for tPCB (from Long and Morgan, 1990).

United Heckathorn Response to Comments

Appendix 3

**ICF Kaiser Engineers Memorandum
September 7, 1994**

1800 Harrison Street
Oakland, California
94612-2321

510/419-6000



ICF TECHNOLOGY INCORPORATED

MEMORANDUM
September 7, 1994

TO: Andy Lincoff

FROM: D. Wayne Berman

DWB

RE: Corrections to the final, "Human Health Risk Assessment for the United Heckathorn Superfund Site, Richmond, California."

In response to the August 17, 1994 comments from Terra Inc. concerning the values reported in Tables 3-2 and 3-3 of the risk assessment report, it appears that a few minor typographical errors were in fact committed. Corrected tables are attached.

First, regarding the column in Table 3-2 in which 95% UCLs are supposed to have been reported, an incorrect direction command in the underlying spreadsheet to the table resulted in the RME exposure point concentrations being repeated in this column rather than the UCLs.

Note that, in no case are the correct UCLs equal to the corresponding maximum detected values, which are reported in the next column of the table. In some cases the correct UCLs are greater than the maximum detected values but this is not unusual for small or highly variable data sets, particularly when the data are adequately described by a lognormal distribution. Because none of the subsequent calculations performed to complete the risk assessment are based on the UCLs reported in this column, no material changes in the risk assessment resulted from this typographical error.

Regarding the column in Table 3-3 in which RME exposure point concentrations in soil were supposed to have been reproduced, a similar direction error in the underlying spreadsheet caused the 95% UCLs to be reported in this column rather than the RME values. Correcting this column of this table changes a small number of other values in this table; however the changes are minor and none of them affect the overall conclusions drawn from this table. Because none of the other calculations in the rest of the risk assessment are derived from the values reported in the corrected column of Table 3-3, no material changes in the risk assessment resulted from this typographical error.

Please call me if you have any further questions concerning these corrections.

DL

TABLE 3-2
ESTIMATED EXPOSURE POINT CONCENTRATIONS IN SOIL¹

COC	Simplified Maximum Likelihood Estimate of the Arithmetic Mean ² (mg/kg)	Coefficient of Variation (mg/kg)	95% UCL ³ (mg/kg)	Maximum Detected Value (mg/kg)	RME Exposure Point Concentration ⁴ (mg/kg)
Surface Soil (less than equal to 1 foot)					
Aldrin	9.0E-02	15.46	6.6E-01	4.1E+00	6.6E-01
4,4'-DDD	1.1E+01	13.90	3.5E+01	5.3E+01	3.5E+01
4,4'-DDE	1.4E+01	21.49	5.6E+01	7.8E+01	5.6E+01
2,4'-DDT	4.8E+01	32.23	4.4E+02	1.2E+02	1.2E+02
4,4'-DDT	1.6E+02	34.29	7.9E+02	7.0E+02	7.0E+02
DDT (total) ⁵	1.8E+02	25.79	7.7E+02	7.4E+02	7.4E+02
Dieldrin	2.3E+00	60.50	1.7E+02	1.7E+01	1.7E+01
Endrin	4.6E-02	8.44	4.8E-01	1.2E-01	1.2E-01
Lead	5.5E+02	3.14	1.3E+03	4.0E+03	1.3E+03
Subsurface Soil (greater than 1 foot)					
Aldrin	6.2E-01	128.69	1.9E+00	2.1E+01	1.9E+00
4,4'-DDD	5.6E+00	46.84	1.3E+01	2.2E+02	1.3E+01
4,4'-DDE	5.7E+00	106.18	1.5E+01	3.0E+01	1.5E+01
2,4'-DDT	7.4E+00	53.67	1.9E+01	5.3E+01	1.9E+01
4,4'-DDT	1.6E+01	41.83	3.6E+01	2.8E+01	3.6E+01
DDT (total)	2.6E+01	36.80	5.7E+01	3.1E+02	5.7E+01
Dieldrin	6.3E+00	278.36	2.3E+01	2.4E+01	2.3E+01
Endrin	4.7E+00	282.40	1.7E+01	6.6E+02	1.7E+01
Lead	2.9E+02	2.98	9.0E+02	2.8E+03	9.0E+02
Soils at All Depths					
Aldrin	4.6E-01	92.57	1.2E+00	2.1E+01	1.2E+00
4,4'-DDD	8.7E+00	47.61	1.8E+01	2.2E+02	1.8E+01
4,4'-DDE	1.2E+01	127.04	2.9E+01	7.8E+01	2.9E+01
2,4'-DDT	1.5E+01	72.20	3.7E+01	1.2E+02	3.7E+01
4,4'-DDT	4.7E+01	69.45	1.0E+02	7.0E+02	1.0E+02
DDT (total)	6.4E+01	52.91	1.3E+02	7.4E+02	1.3E+02
Dieldrin	5.7E+00	236.55	1.9E+01	2.4E+01	1.9E+01
Endrin	3.1E+00	208.73	1.0E+01	6.6E+02	1.0E+01
Lead	4.4E+02	3.14	8.2E+02	4.0E+03	8.2E+02

¹ The values presented in this table include the changes to the database necessitated by the new data reported in Levine-Fricke (1983) and Weston (1983). Units are in mg/kg (ppm) unless otherwise stated.

² This is a maximum likelihood estimate of the arithmetic mean of the data assuming the data are lognormally distributed. This is assumed to be the best estimate available for the value of the concentration. Even these values, however, are expected to be somewhat conservative.

³ The 95% UCL is based on Lard (1975) as discussed in Gilbert (1987).

⁴ RME exposure point concentration determination is the lesser of the maximum detected value and the 95% UCL. This is expected to represent the reasonable maximum estimate of soil concentrations.

⁵ The representative concentration for total DDT were derived by summing 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. The 4,4'-DDT do not strictly add to the sum of the other two components.

TABLE 3-3
ESTIMATED EMISSION RATES AND AIRBORNE EXPOSURE POINT CONCENTRATIONS
(ASSUMING VARIOUS EMISSION MECHANISMS)

COCs	CS RME Exposure Point Concentration in Soil ¹ (mg/kg)	Q ₁₀ Emission Rates			CA ₁₀ Exposure Point Concentration in Air ²		
		Estimated Chemical-specific Wind Erosion (mg/sec)	Estimated Chemical-specific Vehicular Traffic (mg/sec)	Excavation and Dumping (mg/sec)	Estimated RME Wind Erosion (mg/m ³)	Estimated RME Vehicular Traffic (mg/m ³)	Excavation and Dumping (mg/m ³)
Surface Soil (< 1 foot)							
Aldrin	6.6E-01	2.1E-08	1.5E-04	7.5E-05	3.8E-12	2.7E-08	1.4E-08
4,4'-DDD	3.5E+01	1.1E-06	8.1E-03	4.0E-03	2.1E-10	1.5E-06	7.3E-07
4,4'-DDE	5.6E+01	1.9E-06	1.3E-02	6.4E-03	3.3E-10	2.3E-06	1.2E-06
2,4'-DDT ³	1.2E+02	3.6E-06	2.7E-02	1.4E-02	6.9E-10	4.9E-06	2.4E-06
4,4'-DDT	7.0E+02	2.3E-05	1.6E-01	8.0E-02	4.1E-09	2.9E-05	1.4E-05
DDT (total) ^{3,4,5}	7.4E+02	2.4E-05	1.7E-01	8.4E-02	4.3E-09	3.1E-05	1.5E-05
Dieldrin	1.7E+01	5.3E-07	3.8E-03	1.9E-03	9.6E-11	6.8E-07	3.4E-07
Endrin	1.2E-01	3.9E-09	2.7E-05	1.4E-05	7.0E-13	5.0E-09	2.5E-09
Lead	1.3E+03	4.2E-05	3.0E-01	1.5E-01	7.6E-09	5.4E-05	2.7E-05
Subsurface Soil (> 1 foot)							
Aldrin	1.9E+00	6.1E-08	4.3E-04	2.2E-04	1.1E-11	7.9E-08	3.9E-08
4,4'-DDD	1.3E+01	4.1E-07	2.9E-03	1.4E-03	7.4E-11	5.3E-07	2.6E-07
4,4'-DDE	1.5E+01	4.9E-07	3.5E-03	1.7E-03	8.9E-11	6.3E-07	3.1E-07
2,4'-DDT ³	1.9E+01	6.2E-07	4.4E-03	2.2E-03	1.1E-10	7.9E-07	3.9E-07
4,4'-DDT	3.6E+01	1.2E-06	8.2E-03	4.1E-03	2.1E-10	1.5E-06	7.4E-07
DDT (total) ^{3,4,5}	5.7E+01	1.9E-06	1.3E-02	6.5E-03	3.4E-10	2.4E-06	1.2E-06
Dieldrin	2.3E+01	7.5E-07	5.4E-03	2.7E-03	1.4E-10	9.7E-07	4.8E-07
Endrin	1.7E+01	5.6E-07	4.0E-03	2.0E-03	1.0E-10	7.1E-07	3.6E-07
Lead	9.0E+02	2.9E-05	2.1E-01	1.0E-01	5.3E-09	3.7E-05	1.9E-05
Soil at All Depths							
Aldrin	1.2E+00	3.6E-08	2.7E-04	1.4E-04	7.0E-12	4.9E-08	2.5E-08
4,4'-DDD	1.9E+01	5.7E-07	4.1E-03	2.0E-03	1.0E-10	7.4E-07	3.7E-07
4,4'-DDE	2.9E+01	9.5E-07	6.7E-03	3.3E-03	1.7E-10	1.2E-06	6.0E-07
2,4'-DDT ³	3.7E+01	1.2E-06	8.5E-03	4.2E-03	2.2E-10	1.5E-06	7.7E-07
4,4'-DDT	1.0E+02	3.4E-06	2.4E-02	1.2E-02	6.1E-10	4.3E-06	2.1E-06
DDT (total) ^{3,4,5}	1.3E+02	4.3E-06	3.1E-02	1.5E-02	7.8E-10	5.5E-06	2.7E-06
Dieldrin	1.9E+01	6.0E-07	4.3E-03	2.1E-03	1.1E-10	7.8E-07	3.9E-07
Endrin	1.0E+01	3.2E-07	2.3E-03	1.1E-03	5.8E-11	4.1E-07	2.1E-07
Lead	8.2E+02	2.7E-05	1.9E-01	9.3E-02	4.8E-09	3.4E-05	1.7E-05

Methodology for estimating exposure point concentration in air is presented in Appendix C.

¹ RME Exposure Point Concentration determination: the lesser of the 95% UCL and the Maximum Detected Value. See Table 3-2.

² Exposure Point Concentration in Air (mg/m³) = Chemical-specific PM₁₀ Emission (mg/sec) x 1/(HxWxD) (sec/m³)

³ 2,4'-DDT was analyzed for in 65% of the samples so that sufficient data is available to include this isomer in our risk analysis. However, because approximately 10% of the samples analyzed for 4,4'-DDT were not also analyzed for the 2,4'-DDT isomer, the 2,4'-DDT isomer could not be properly incorporated into the parameter representing total DDT. Thus, 2,4'-DDT is carried through the risk assessment as a separate analyte. In any case, as demonstrated on these tables, the error contributed to risk if the 2,4'-DDT isomer is ignored is less than 30%, which is small compared to other sources of error in risk assessment.

⁴ The representative concentrations for total DDT were derived by summing 4,4'-DDD, 4,4'-DDE and 4,4'-DDT measured in each individual sample and then deriving separate summary statistics for this parameter. Therefore, the sum of the summary statistics representing 4,4'-DDD, 4,4'-DDE and 4,4'-DDT (presented in this table) do not strictly add to the summary statistic presented for total DDT.

⁵ In the event that the total DDT concentration in this table is less than 90% of the samples were analyzed for these isomers. It is expected, however, that the

**Statement of Work for
Upland Cap Remedial Design and Remedial Action at the
United Heckathorn Superfund Site
Richmond, California**

September 28, 1995

1. Purpose.

The purpose of Remedial Design and Remedial Action at the United Heckathorn Site is to implement the remedy selected in the Record of Decision dated October 26, 1994. The goal of the upland cap portion of the remedy is to reduce the potential for future pesticide contamination in the marine environment by containing contaminated soils and preventing erosion.

2. Site Background.

The United Heckathorn Superfund Site in Richmond, California, was used to formulate pesticides from approximately 1947 to 1966. Soils at the Site and sediments in Richmond Harbor were contaminated with various chlorinated pesticides, primarily DDT and dieldrin, as a result of these pesticide formulation activities. At the time of Site listing in 1990, a visible deposit of pesticide residue was present on the Lauritzen Channel embankment. Several response actions have already been taken to cleanup the most contaminated upland areas of the Site, including the Lauritzen Channel embankment. Under EPA Removal Order 90-22, a group of Potentially Responsible Parties (PRPs) excavated the embankment deposit and transported it offsite to a permitted disposal facility. During subsequent actions through 1993 pursuant to the removal order, all known additional upland soil deposits containing high levels of pesticides were removed, as were piles of contaminated soils generated in earlier actions.

A soils database representing current site conditions was compiled in EPA's Human Health Risk Assessment (ICF Technology, 1994) from the previous site studies and removal action reports. A conservative estimate of the remaining mean site soil concentrations of the primary Contaminants of Concern (COCs), DDT (total) and dieldrin, are 64 and 5.7 milligrams per kilogram (mg/kg), respectively. These estimates are conservative because the soils database includes the large number of additional samples which were taken to delineate the hot-spot areas for the removal actions. The actual mean site concentrations are likely to be lower.

DDT at levels exceeding 1 mg/kg in upland soils extends over approximately 5 acres of the northern unpaved portion of the site as shown in Figure 4 of the ROD. The total mass of these upland soils is approximately 95,000 tons (Levine-Fricke, 1993). Confirmation sampling performed during the excavations of the most contaminated areas indicated that the concentrations drop to

nondetectable levels in the younger bay mud immediately below the upland soils, demonstrating that the homogeneous silty-clay bay mud underlying the site is an effective barrier to downward migration of site chemicals. Due to the Site's proximity to San Francisco Bay, the shallow groundwater at the Site is naturally saline and is not a source of drinking water under state or federal law.

3. Description of Remedy.

The selected remedial action for the upland portion of the site include:

- Capping of areas around the former Heckathorn facility.
- A deed restriction or notice limiting use of the Levin-Richmond terminal to the current industrial classification.

Tasks are described in more detail below. It is the responsibility of the Settling Work Defendants to ensure that the Remedial Design addresses the overall project goals and requirements of the Record of Decision.

Capping of Upland Area. The results of the human health risk assessment indicate that the removal actions performed at the site between 1990 and 1993 reduced contaminant concentrations in upland soils to levels that are acceptable for current and expected future commercial or industrial uses. Nevertheless, roughly 95,000 tons of soils over a large area of the site exceed the much lower remedial action goal for marine sediments. Therefore, a remediation goal of erosion prevention was established for upland soils. The cap must be designed, constructed, and operated and maintained to prevent loss of soil from the site caused by wind, rain, or facility activities.

Institutional Controls. The human health risk assessment concluded that the concentrations of COCs in upland soils at the Levin Richmond Terminal had been reduced to acceptable levels for current and expected future industrial uses. This is consistent with the San Francisco Bay Plan under which the area is zoned for port priority or water-related industrial use. In order to provide an additional measure of assurance that the site could not be converted to other use without further study and possibly further remediation, a deed restriction or notice on the property is required as part of the remedy.

The Lauritzen Channel is currently posted with signs warning fishermen that fish and shellfish may be contaminated with DDT and other pesticides. These signs will remain in place until post-remedial monitoring confirms that concentrations of the COCs have been reduced to acceptable levels.

4. Project Documents.

A. RD/RA Workplan.

The Settling Work Defendants shall prepare and submit a draft RD/RA Work Plan within 60 calendar days after signing of the Consent Decree (CD). The Work Plan shall include a description of the activities to be performed and the plans and specifications to be prepared. A schedule for completion of each activity and submittal shall also be included.

Specifically, the Work Plan shall present the following:

- A statement of the problem(s) and potential problem(s) posed by the site and how the objectives of the RD/RA will address the problem(s).
- A background summary setting forth: (1) a brief description of the site; (2) a brief synopsis of the history of the site; (3) a summary of the existing data including physical and chemical characteristics of the contaminants identified and their distribution among the environmental media at the site.
- The Settling Work Defendants's technical approach to each task to be performed, including a detailed description of each task.
- A schedule for completion of each required activity and submission of each deliverable required by this SOW.
- An organizational structure which outlines the responsibilities and authority of all organizations and key personnel involved in the RD/RA. A description of key project personnel's qualifications (project manager, resident engineer, quality assurance official, etc.) shall be provided.

B. Health and Safety Plan.

The Settling Work Defendants shall prepare a site-specific HASP that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures, and a contingency plan in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120. Health and Safety Plans prepared previously for the site may be reviewed to determine whether they are sufficient to satisfy this requirement.

C. Operation and Maintenance.

The purpose of O&M is to protect the integrity of the cap and to evaluate performance. The plan shall describe and analyze potential operating problems such as disturbance by heavy equipment and failure to prevent contaminant releases through stormwater. The Settling Work Defendants shall identify any potential failures and develop corrective action plans.

The Operations and Maintenance manual shall include a Field Sampling Plan (FSP) which will define the sampling and data collection methods that will be used to analyze the stormwater pathway to confirm the long-term effectiveness of the cap. The FSP shall include sampling objectives; sample locations and frequency; sampling equipment and procedures; and sample handling and analysis. A Quality Assurance Project Plan (QAPP) shall also be prepared to describe the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols to shall be used.

The Settling Work Defendants shall review and update the O&M Manual, as necessary, to include as-built drawings. The final O&M manual shall be submitted with the closeout report.

D. Preliminary Design.

Preliminary Design begins with the initial design and ends with the completion of approximately 30 percent of the design effort. At this stage, the Settling Work Defendants shall have field-verified the existing conditions of the site, as necessary.

E. Pre-final/Final Design.

The Prefinal Design shall function as the draft version of the Final Design. The Prefinal Design shall address comments generated from the Preliminary Design Review and clearly show any modifications of the design as a result of incorporation of the comments. After EPA review and comment on the Prefinal Design, the Final Design shall be submitted. All Final Design documents shall be approved by a Professional Engineer registered in California. EPA approval of the Final Design is required before initiating the RA, unless specifically authorized by EPA. The pre-final design shall include a complete set of construction drawings and specifications (general specifications, drawings, and schematics) shall be submitted at the prefinal stage.

F. Closeout Report.

After implementation of the Remedial Action, the Settling Work Defendants shall conduct the necessary inspections to verify completed work and prepare a Remedial Action Report.

5. Schedule

The Settling Work Defendants shall submit deliverables and implement Remedial Action according to the following schedule.

- A. Draft Work Plan
- Draft Health and Safety Plan
- Draft Operations and Maintenance Manual

Draft Deed Restriction

60 days after signing of the Consent Decree or 10 days after EPA's issuance of an authorization to proceed pursuant to Paragraph 10 of the Levin Group RD/RA Consent Decree, whichever is later.

- B. Final Work Plan
Final Health and Safety Plan
Final Deed Restriction

20 days after receiving comments from EPA.

- C. Preliminary Design

45 days after finalization of the workplan.

- D. Pre-final/Final Design

30 days after receiving comment on the Preliminary Design from EPA.

- E. Begin Remedy Implementation

90 days after receiving notice from EPA of completion of marine remediation.

- F. Closeout Report and Final Operations and Maintenance Manual

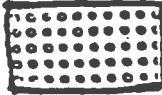
30 days after completion of Remedial Action.

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CONSENT DECREE
APPENDIX C

700617
PAGE 12

THE LAND REFERRED TO HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF CONTRA COSTA, CITY OF RICHMOND, DESCRIBED AS FOLLOWS:

PARCEL 1:



PORTION OF TIDE LAND LOTS 26 AND 27, SECTION 13, PORTION OF TIDE LAND LOTS 6, 7, 10 AND 11, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AND A PORTION OF SWAMP AND OVERFLOW LANDS IN SAID TOWNSHIP AND RANGE, DESCRIBED AS FOLLOWS:

BEGINNING ON THE SOUTH LINE OF THE 3.39 ACRE STRIP OF LAND DESCRIBED IN THE DEED TO THE CITY OF RICHMOND, RECORDED AUGUST 11, 1948, BOOK 1272, OFFICIAL RECORDS, PAGE 161, AT THE NORTHWEST CORNER OF THE 8.938 ACRE PARCEL OF LAND DESCRIBED IN THE DEED TO TIME OIL COMPANY, RECORDED JUNE 23, 1950, BOOK 1580, OFFICIAL RECORDS, PAGE 53; THENCE FROM SAID POINT OF BEGINNING ALONG THE WEST LINES OF SAID 8.938 ACRE PARCEL SOUTH $7^{\circ} 22' 42''$ EAST, 755.15 FEET AND SOUTH $39^{\circ} 35' 54''$ WEST 183.99 FEET TO THE SOUTHWEST CORNER THEREOF; THENCE CONTINUING SOUTH $39^{\circ} 35' 54''$ WEST, 148.21 FEET TO THE SOUTH LINE OF THE PARCEL OF LAND FIRSTLY DESCRIBED IN THE DEED TO PARR-RICHMOND INDUSTRIAL CORPORATION, RECORDED JUNE 1, 1949, BOOK 1394, OFFICIAL RECORDS, PAGE 370; THENCE ALONG THE EXTERIOR BOUNDARY LINES OF SAID PARCEL (1394 OR 370), AS FOLLOWS:

NORTH $50^{\circ} 45' 20''$ WEST, 837.27 FEET; NORTH $0^{\circ} 08'$ EAST, 287.09 FEET; NORTH $41^{\circ} 46'$ EAST, 94.75 FEET; NORTH $4^{\circ} 45'$ EAST, 646.21 FEET; SOUTH $89^{\circ} 50' 50''$ EAST, 75.64 FEET; NORTH $12^{\circ} 47' 24''$ EAST, 231.34 FEET; NORTH $89^{\circ} 55'$ EAST, 39.57 FEET; NORTH $0^{\circ} 05'$ WEST, 309.99 FEET; NORTH $16^{\circ} 00' 31''$ EAST, 60.11 FEET; NORTH $6^{\circ} 09' 11''$ EAST, 121.33 FEET; NORTH $89^{\circ} 55'$ EAST, 8.55 FEET AND NORTH $0^{\circ} 08'$ EAST, 30.82 FEET; THENCE LEAVING SAID EXTERIOR BOUNDARY LINE SOUTH $89^{\circ} 35'$ EAST, 144.10 FEET; THENCE SOUTH $6^{\circ} 53'$ EAST, 49.45 FEET; THENCE SOUTH $5^{\circ} 04'$ WEST, 833 FEET; THENCE SOUTH $84^{\circ} 56'$ EAST, 173.95 FEET TO THE WEST LINE OF SAID 3.39 ACRE PARCEL; THENCE ALONG THE WEST AND SOUTH LINES OF SAID 3.39 ACRE PARCEL, SOUTH $0^{\circ} 31'$ WEST, 373.95 FEET AND SOUTH $89^{\circ} 31'$ EAST, 195.48 FEET TO THE POINT OF BEGINNING.

PARCEL 2:



PORTION OF BLOCK 50 AND A PORTION OF FOURTH STREET AS SHOWN ON THE REVISED MAP OF SANTA FE, FILED AUGUST 24, 1915, IN BOOK 12 OF MAPS, PAGE 280; PORTION OF LOT 42 AS SHOWN ON THE MAP OF SAN PABLO RANCHO FILED MARCH 1, 1894; PORTION OF TIDE LOT 27, SECTION 13 AND A PORTION OF TIDE LOT 6, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON MAP NO. 1 SALT MARSH AND TIDE

LANDS; FILED JUNE 11, 1917, IN RACK MAP NO. 9, IN THE OFFICE OF THE COUNTY RECORDER OF CONTRA COSTA COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING ON THE MOST WESTERN LINE OF THAT CERTAIN STRIP OF LAND CONTAINING 3.39 ACRE, MORE OR LESS, DESCRIBED IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO CITY OF RICHMOND, RECORDED AUGUST 11, 1948, IN BOOK 1272 OF OFFICIAL RECORDS, PAGE 161, AT THE EASTERN TERMINUS OF THE LINE GIVEN AS "NORTH 84° 56' WEST, 173.95 FEET" THE BEARING OF SAID LINE BEING TAKEN AS NORTH 83° 58' 39" WEST FOR THE PURPOSE OF THIS DESCRIPTION, IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO PARR-RICHMOND TERMINAL COMPANY, RECORDED DECEMBER 30, 1955, IN BOOK 2681 OF OFFICIAL RECORDS, PAGE 353; THENCE FROM SAID POINT OF BEGINNING ALONG THE EXTERIOR LINES OF SAID PARCEL (2681 OR 353) AS FOLLOWS:

NORTH 83° 58' 39" WEST, 173.95 FEET; NORTH 6° 01' 21" EAST, 833.81 FEET; NORTH 5° 55' 39" WEST, 49.45 FEET AND NORTH 88° 37' 39" WEST, 18.85 FEET; THENCE NORTH 4° 14' 09" WEST, 44.61 FEET; THENCE NORTHERLY ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 360 FEET A ARC DISTANCE OF 51.31 FEET; THENCE NORTH 3° 55' 51" EAST, 88.52 FEET TO THE SOUTH LINE OF CUTTING BOULEVARD; THENCE SOUTH 88° 39' 09" EAST ALONG SAID SOUTH LINE 24.79 FEET TO THE SOUTH LINE OF THE PARCEL OF LAND DESCRIBED AS PARCEL ONE IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO SOUTHERN PACIFIC RAILROAD COMPANY, RECORDED AUGUST 7, 1953, IN BOOK 2172 OF OFFICIAL RECORDS, PAGE 514; THENCE ALONG SAID SOUTH LINE AS FOLLOWS:

SOUTH 83° 58' 13" EAST, 68.37 FEET; EASTERLY ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 291.90 FEET A ARC DISTANCE OF 35.37 FEET AND SOUTH 73° 32' 21" EAST, 7.49 FEET TO THE EXTENSION OF THE MOST WESTERN LINE OF SAID CITY OF RICHMOND PARCEL (1272 OR 161); THENCE SOUTH 1° 28' 21" WEST ALONG SAID EXTENSION AND ALONG SAID WESTERN LINE 1057.71 FEET TO THE POINT OF BEGINNING.

PARCEL 4:



A PORTION OF AMENDMENT TO MAP OF ELLIS LANDING, FILED OCTOBER 28, 1917, IN BOOK 11 OF MAPS, PAGE 247; AND A PORTION OF TIDE LOTS 5 AND 12, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON MAP NO. 1, SALT MARSH AND TIDE LANDS, FILED JUNE 11, 1917, SAID MAPS BEING FILED IN THE OFFICE OF THE COUNTY RECORDER OF CONTRA COSTA COUNTY AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WESTERN LINE OF EIGHTH STREET AS SAID STREET IS SHOWN ON SAID AMENDMENT TO MAP OF ELLIS LANDING, SAID POINT

BEING ALSO THE SOUTHEAST CORNER OF THE 3.39 ACRE STRIP DESCRIBED IN DEED FROM PARR RICHMOND INDUSTRIAL CORPORATION TO THE CITY OF RICHMOND FOR STREET PURPOSES, (SAID PORTION OF SAID STRIP BEING - COMMONLY CALLED WRIGHT AVENUE), RECORDED AUGUST 11, 1948, IN BOOK 1272 OF OFFICIAL RECORDS, PAGE 161; THENCE SOUTH $1^{\circ} 26' 21''$ WEST ALONG THE WESTERN LINE OF SAID EIGHTH STREET AND ITS SOUTHERLY PROJECTION 1229.02 FEET TO THE SOUTHERLY LINE OF DOCK AVENUE AS SAID DOCK AVENUE IS SHOWN ON SAID AMENDMENT TO MAP OF ELLIS LANDING; THENCE SOUTH $62^{\circ} 53' 39''$ EAST ALONG SAID SOUTHERLY LINE OF DOCK AVENUE, 15.76 FEET TO THE NORTHERN CORNER OF THE TRACT OF LAND DESCRIBED AS PARCEL ONE IN THE DEED FROM ELLIS LANDING AND DOCK CO., A CORPORATION, TO THE CITY OF RICHMOND, DATED FEBRUARY 10, 1926, RECORDED APRIL 22, 1926, IN BOOK 29 OF OFFICIAL RECORDS, PAGE 283; THENCE SOUTH $4^{\circ} 19' 34''$ EAST ALONG THE WEST LINE OF SAID LAST MENTIONED PARCEL AND ALONG THE WEST LINE OF PARCEL TWO DESCRIBED IN SAID DEED (29 OR 283), 120.30 FEET TO THE NORTHERLY U.S. PIERHEAD AND BULKHEAD LINE OF SAID RICHMOND INNER HARBOR; THENCE NORTH $71^{\circ} 04' 25''$ WEST ALONG SAID NORTHERLY LINE 467 FEET TO THE SOUTHERLY EXTENSION OF THE EASTERLY LINE OF THE PARCEL OF LAND DESCRIBED IN DEED FROM PARR RICHMOND INDUSTRIAL CORPORATION TO TIME OIL CO., DATED JUNE 9, 1950 AND RECORDED JUNE 23, 1950, IN BOOK 1580 OF OFFICIAL RECORDS, PAGE 553; THENCE NORTH $2^{\circ} 38' 09''$ WEST ALONG SAID SOUTHERLY EXTENSION AND SAID EASTERLY LINE, 1218.26 FEET TO THE SOUTHERLY LINE OF THE SAID 3.39 ACRE STRIP (1272 OR 161); THENCE SOUTH $88^{\circ} 33' 39''$ EAST ALONG SAID SOUTHERLY LINE, 505.76 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM:

THE PARCEL OF LAND DESCRIBED IN THE DEED TO TIME OIL CO., RECORDED NOVEMBER 23, 1966, BOOK 5250, OFFICIAL RECORDS, PAGE 411.

PARCEL 6:



BEGINNING AT THE NORTHWESTERN CORNER OF THE LAND DESIGNATED AS PARCEL 2 IN THE QUIT CLAIM DEED TO PARR-RICHMOND INDUSTRIAL CORPORATION, RECORDED JUNE 1, 1949 IN BOOK 1394 OF OFFICIAL RECORDS OF CONTRA COSTA COUNTY, PAGE 370; RUNNING THENCE ALONG THE NORTHERN LINE OF SAID LAND, BEING THE SOUTHERN LINE OF CUTTING BOULEVARD, EASTERLY, 88.61 FEET TO THE EASTERN LINE OF THE LAND SECONDLY DESCRIBED IN THE DEED TO PARR-RICHMOND TERMINAL CORPORATION, RECORDED DECEMBER 30, 1953, IN BOOK 2681 OF OFFICIAL RECORDS OF CONTRA COSTA COUNTY, PAGE 353; THENCE ALONG THE LAST NAMED LINE SOUTH $1^{\circ} 56'$ WEST, SAID BEARINGS USED FOR THE PURPOSE OF THIS DESCRIPTION, 139.51 FEET AND SOUTH $6^{\circ} 53'$ WEST 38.59 FEET TO THE NORTHERN LINE OF THE LAND FIRSTLY DESCRIBED IN SAID LAST MENTIONED DEED; THENCE ALONG THE LAST NAMED LINE NORTH $89^{\circ} 34'$ WEST 144.10 FEET TO THE WESTERN LINE OF SAID LAND FIRST MENTIONED 1394 OR 370; AND THENCE ALONG THE LAST NAMED LINE NORTH 83 FEET AND NORTH $39^{\circ} 53'$ EAST 84.13 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM:

THAT PORTION THEREOF LYING WITHIN THE LINES OF THE PARCEL OF LAND DESCRIBED AS PARCEL ONE IN THE DEED TO PARR-RICHMOND TERMINAL COMPANY, RECORDED OCTOBER 4, 1951, BOOK 3966, OFFICIAL RECORDS, PAGE 474

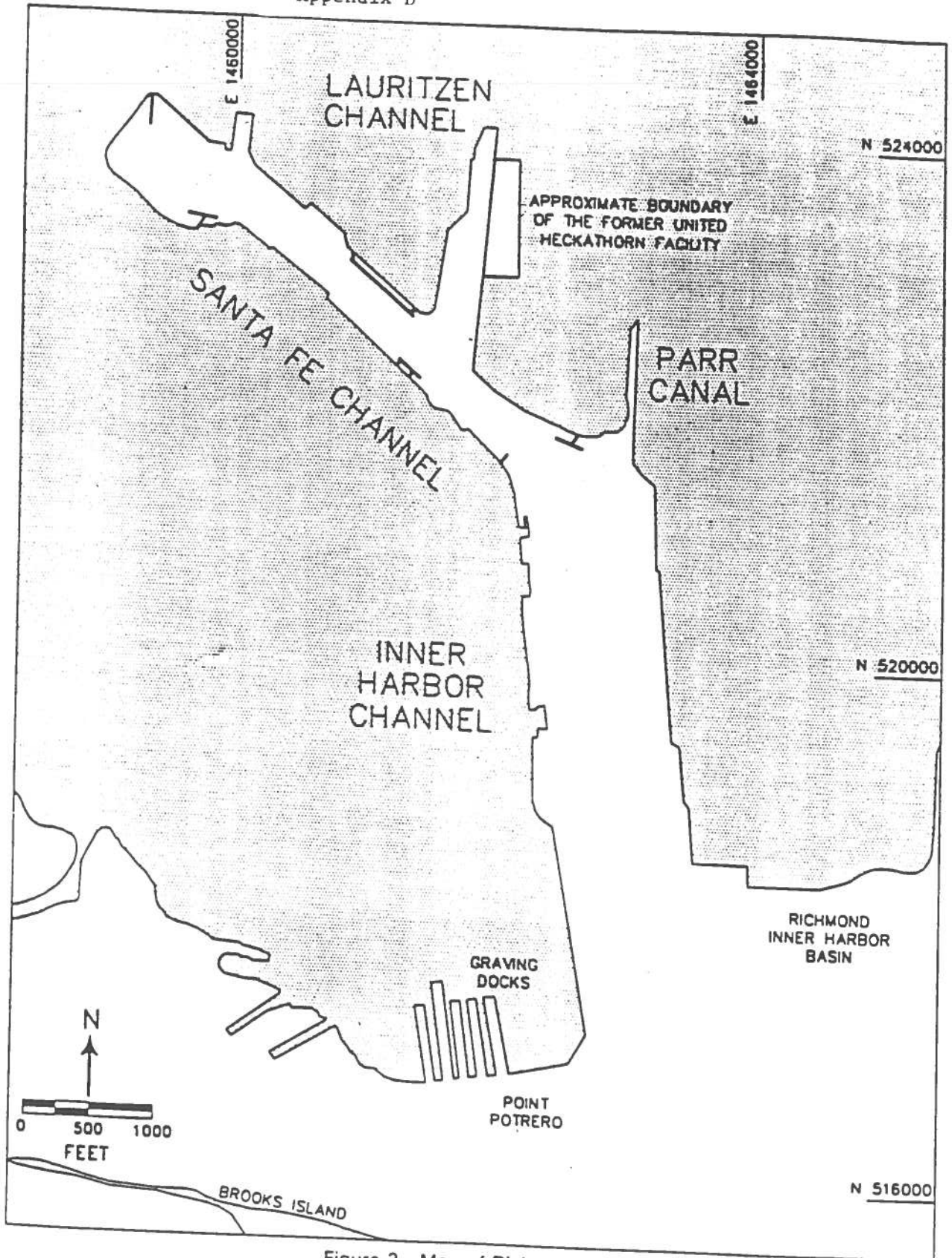


Figure 2. Map of Richmond Harbor.

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APPENDIX E

Recording Requested By:
Keith Howard, Cooper White & Cooper
1333 North California Blvd., Suite 450
Walnut Creek, CA 94596

When Recorded, Mail To:
Keith Howard, Cooper White & Cooper
1333 North California Blvd., Suite 450
Walnut Creek, CA 94596

COVENANT

TO RESTRICT USE OF PROPERTY

Levin Enterprises, Inc. - Richmond Site

This Covenant and Agreement ("Covenant") is made on the ___ day of May 1996, by Levin Enterprises, Inc. ("Covenantor"), who is the owner of record of certain Property situated in the City of Richmond, County of Contra Costa, State of California, described in Exhibit "A" attached hereto and incorporated herein by this reference ("the Property"), with reference to the following facts:

- A. The Property contains hazardous substances;
- B. Portions of the Property have been designated by the United States Environmental Protection Agency as a Superfund site on the National Priorities' List. Potentially responsible parties at the site have been identified by the Environmental Protection Agency, and such parties have entered into a series of four Consent Decrees with the United States providing for the

remediation of the Site in accordance with the United States Environmental Protection Agency's Record of Decision executed on October 26, 1994 (ROD).

Covenantor has entered into such a Consent Decree with the United States in an action entitled United States of America, Plaintiff vs. Montrose Chemical Corporation of California, et al., Defendants, No. _____

(Consent Decree) in the United States District Court, Northern District of California,. (Hereinafter referred to as Covenantor Consent Decree).

B.1. Contamination of the Property. Portions of the soil on the Property and adjoining underwater sediments have become contaminated with hazardous substances, including Dichlorodiphenylchloroethane (DDT), Dichlorodiphenyl-dechloroethylene (DDE), and Dieldrin. Remedial activities that have occurred at the Property and that will occur pursuant to the above-referenced Consent Decrees are designed to eliminate any significant risk to human health and/or the environment from the above-referenced contaminants.

B.2. Surrounding Land use and Population Potentially Affected. Land use in the immediate vicinity of the Property is industrial. The nearest residential area is approximately one quarter of a mile to the Northeast of the Property.

C. Covenantor desires and intends that in order to protect

the present or future public health and safety, the Property shall be used in such a manner as to avoid potential harm to persons or Property which may result from hazardous substances which have been deposited on portions of the Property.

ARTICLE I

GENERAL PROVISIONS

- 1.01 Provisions to Run With the Land. This Covenant sets forth protective provisions, covenants, restrictions and conditions (collectively referred to as "Restrictions") upon and subject to which the Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered and/or conveyed. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Property, and shall apply to, inure to the benefit of and bind the respective successors in interest thereof. Each and all of the Restrictions are imposed upon the entire Property unless expressly stated as applicable to a specific portion of the Property. Each and all of the restrictions are for the benefit of and enforceable by the United States Environmental Protection Agency.
- 1.02 Concurrence of Owners Presumed. All purchasers, lessees, or possessors of any portion of the Property shall be deemed by their purchase, leasing, or possession of such Property, to be in accord with the foregoing and to agree for and among

themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of future Owners and Occupants and that their interest in the Property Shall be subject to the Restrictions contained herein.

1.03 Notice of Entry of Consent Decree On _____ 1996 the Covenantor Consent Decree was entered in the United States District Court, Northern District of California. A copy of the Covenantor Consent Decree is available for inspection at the Property subject to this Covenant.

1.04 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein and in the Covenantor Consent Decree shall be incorporated by reference in each and all deeds and leases of any portion of the Property.

ARTICLE II

DEVELOPMENT, USE AND CONVEYANCE OF THE PROPERTY

2.01 Restrictions on Development and Use. Covenantor promises to restrict the use of that portion of the Property as described in Exhibit B as follows:

- a. Development of the Property shall be restricted to commercial or industrial use.
- b. No residence for human habitation shall be permitted on the Property.
- c. No hospitals shall be permitted on the Property.
- d. No schools for persons under 18 years of age shall be permitted on the Property.
- e. No day care centers for children shall be permitted on

the Property.

2.02 Conveyance of Property. The Covenantor shall provide a thirty (30) day advance notice to the United States Environmental Agency of any lease of the entire Property or other conveyance of the Property or an interest in the Property to a third person.

2.03 Notice in Agreements. Covenantor shall execute a written instrument which shall accompany all purchase, lease, sublease, or rental agreements relating to the Property. The instrument shall contain the following statement:

"The land described herein contains hazardous substances and therefore is subject to a Covenant to Restrict Use of Property which has been recorded. This statement is not a declaration that a hazard exists."

ARTICLE III

ACCESS

3.01 Notice of Obligation to Provide Access. Beginning on June 1, 1996, the Covenantor agrees to provide access at all reasonable times to the Site and, to the extent access to the Property is controlled by Covenantor, any other Property to which access is required for the implementation of the response actions called for in the ROD. Such access shall be provided to the United States and its representatives, (including EPA and its contractors); the Supervising Contractor and its employees, agents and subcontractors, and

technical representatives of any potentially responsible party performing response actions at the Site pursuant to an EPA order or agreement. Access shall be for the purposes of conducting any activity related to the Consent Decree including, but not limited to:

- a. Monitoring the Work;
- b. Verifying any data or information submitted to the United States;
- c. Conducting investigations relating to contamination at or near the Site;
- d. Obtaining samples;
- e. Assessing the need for, planning, or implementing additional response actions at or near the Site;
- f. Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Settling Defendants or their agents; and
- g. Assessing Covenantor's compliance with this Consent Decree, or assessing other potentially responsible parties' compliance with an EPA order or agreement.

IV.

MISCELLANEOUS

4.01 Partial Invalidity. If any portion of the Restriction or terms set forth herein is determined to be involved for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

4.02 Recordation. This instrument shall be executed by the Covenantor and shall be recorded by the Covenantor in the County

of Contra Costa within ten (10) days of the date of entry of the
Covenantor Consent Decree.

IN WITNESS WHEREOF, the parties execute this Covenant as of the
date set forth above.

OWNER:

By: _____

Title: _____

Date: _____

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

On this the ____ day of _____, 1996, before me, the
undersigned Notary Public, personally appeared
_____, personally known to me (or proved
to me on the basis of satisfactory evidence) to be the person
whose name is subscribed to the within instrument and
acknowledged that he/she executed the same in his/her authorized
capacity, and that by his/her signature on the instrument the
person or the entity upon behalf of which the person acted,
executed the instrument.

WITNESS my hand and official seal.

Notary's Signature

137313.1

THE LAND REFERRED TO HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF CONTRA COSTA, CITY OF RICHMOND, DESCRIBED AS FOLLOWS:

PARCEL 1:



PORTION OF TIDE LAND LOTS 26 AND 27, SECTION 13, PORTION OF TIDE LAND LOTS 6, 7, 10 AND 11, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AND A PORTION OF SWAMP AND OVERFLOW LANDS IN SAID TOWNSHIP AND RANGE, DESCRIBED AS FOLLOWS:

BEGINNING ON THE SOUTH LINE OF THE 3.39 ACRE STRIP OF LAND DESCRIBED IN THE DEED TO THE CITY OF RICHMOND, RECORDED AUGUST 11, 1948, BOOK 1272, OFFICIAL RECORDS, PAGE 161, AT THE NORTHWEST CORNER OF THE 8.9 ACRE PARCEL OF LAND DESCRIBED IN THE DEED TO TIME OIL COMPANY, RECORDED JUNE 23, 1950, BOOK 1580, OFFICIAL RECORDS, PAGE 53; THENCE FROM SAID POINT OF BEGINNING ALONG THE WEST LINES OF SAID 8.938 ACRE PARCEL SOUTH $7^{\circ} 22' 42''$ EAST, 755.15 FEET AND SOUTH $39^{\circ} 35' 54''$ WEST 183.99 FEET TO THE SOUTHWEST CORNER THEREOF; THENCE CONTINUING SOUTH $39^{\circ} 35' 54''$ WEST, 148.21 FEET TO THE SOUTH LINE OF THE PARCEL OF LAND FIRSTLY DESCRIBED IN THE DEED TO PARR-RICHMOND INDUSTRIAL CORPORATION, RECORDED JUNE 1, 1949, BOOK 1394, OFFICIAL RECORDS, PAGE 370; THENCE ALONG THE EXTERIOR BOUNDARY LINES OF SAID PARCEL (1394 OR 370), AS FOLLOWS:

NORTH $50^{\circ} 45' 20''$ WEST, 837.27 FEET; NORTH $0^{\circ} 08'$ EAST, 287.09 FEET; NORTH $41^{\circ} 46'$ EAST, 94.75 FEET; NORTH $4^{\circ} 45'$ EAST, 646.21 FEET; SOUTH $89^{\circ} 50' 50''$ EAST, 75.64 FEET; NORTH $12^{\circ} 47' 24''$ EAST, 231.34 FEET; NORTH $89^{\circ} 55'$ EAST, 39.57 FEET; NORTH $0^{\circ} 05'$ WEST, 309.99 FEET; NORTH $16^{\circ} 00' 31''$ EAST, 60.11 FEET; NORTH $6^{\circ} 09' 11''$ EAST, 121.33 FEET; NORTH $89^{\circ} 55'$ EAST, 8.55 FEET AND NORTH $0^{\circ} 08'$ EAST, 30.82 FEET; THENCE LEAVING SAID EXTERIOR BOUNDARY LINE SOUTH $89^{\circ} 35'$ EAST, 144.10 FEET; THENCE SOUTH $6^{\circ} 53'$ EAST, 49.45 FEET; THENCE SOUTH $5^{\circ} 04'$ WEST, 833. FEET; THENCE SOUTH $84^{\circ} 56'$ EAST, 173.95 FEET TO THE WEST LINE OF SAID 3.39 ACRE PARCEL; THENCE ALONG THE WEST AND SOUTH LINES OF SAID 3.39 ACRE PARCEL, SOUTH $0^{\circ} 31'$ WEST, 373.95 FEET AND SOUTH $89^{\circ} 31'$ EAST, 195.48 FEET TO THE POINT OF BEGINNING.

PARCEL 2:



PORTION OF BLOCK 50 AND A PORTION OF FOURTH STREET AS SHOWN ON THE REVISED MAP OF SANTA FE, FILED AUGUST 24, 1915, IN BOOK 12 OF MAPS, PAGE 280; PORTION OF LOT 42 AS SHOWN ON THE MAP OF SAN PABLO RANCHO, FILED MARCH 1, 1894; PORTION OF TIDE LOT 27, SECTION 13 AND A PORTION OF TIDE LOT 6, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON MAP NO. 1 SALT MARSH AND TIDE

LANDS; FILED JUNE 11, 1917, IN RACK MAP NO. 9, IN THE OFFICE OF THE COUNTY RECORDER OF CONTRA COSTA COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING ON THE MOST WESTERN LINE OF THAT CERTAIN STRIP OF LAND CONTAINING 3.39 ACRE, MORE OR LESS, DESCRIBED IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO CITY OF RICHMOND, RECORDED AUGUST 11, 1948, IN BOOK 1272 OF OFFICIAL RECORDS, PAGE 161, AT THE EASTERN TERMINUS OF THE LINE GIVEN AS "NORTH 84° 56' WEST, 173.95 FEET" THE BEARING OF SAID LINE BEING TAKEN AS NORTH 83° 58' 39" WEST FOR THE PURPOSE OF THIS DESCRIPTION, IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO PARR-RICHMOND TERMINAL COMPANY, RECORDED DECEMBER 30, 1955, IN BOOK 2681 OF OFFICIAL RECORDS, PAGE 353; THENCE FROM SAID POINT OF BEGINNING ALONG THE EXTERIOR LINES OF SAID PARCEL (2681 OR 353) AS FOLLOWS:

NORTH 83° 58' 39" WEST, 173.95 FEET; NORTH 6° 01' 21" EAST, 833.81 FEET; NORTH 5° 55' 39" WEST, 49.45 FEET AND NORTH 88° 37' 39" WEST, 18.85 FEET; THENCE NORTH 4° 14' 09" WEST, 44.61 FEET; THENCE NORTHERLY ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 360 FEET AN ARC DISTANCE OF 51.31 FEET; THENCE NORTH 3° 55' 51" EAST, 88.52 FEET TO THE SOUTH LINE OF CUTTING BOULEVARD; THENCE SOUTH 88° 39' 09" EAST ALONG SAID SOUTH LINE 24.79 FEET TO THE SOUTH LINE OF THE PARCEL OF LAND DESCRIBED AS PARCEL ONE IN THE DEED FROM PARR-RICHMOND INDUSTRIAL CORPORATION TO SOUTHERN PACIFIC RAILROAD COMPANY, RECORDED AUGUST 7, 1953, IN BOOK 2172 OF OFFICIAL RECORDS, PAGE 514; THENCE ALONG SAID SOUTH LINE AS FOLLOWS:

SOUTH 83° 58' 13" EAST, 68.37 FEET; EASTERLY ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 291.90 FEET OF 35.37 FEET AND SOUTH 73° 32' 21" EAST, 7.49 FEET TO THE EXTENSION NORTH 1° 28' 21" EAST AT THE MOST WESTERN LINE OF SAID CITY OF RICHMOND PARCEL (1272 OR 161); THENCE SOUTH 1° 28' 21" WEST ALONG SAID EXTENSION AND ALONG SAID WESTERN LINE 1057.71 FEET TO THE POINT OF BEGINNING.

PARCEL 4:



A PORTION OF AMENDMENT TO MAP OF ELLIS LANDING, FILED OCTOBER 28, 1913, IN BOOK 11 OF MAPS, PAGE 247; AND A PORTION OF TIDE LOTS 5 AND 12, SECTION 24, TOWNSHIP 1 NORTH, RANGE 5 WEST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON MAP NO. 1, SALT MARSH AND TIDE LANDS, FILED JUNE 11, 1917, SAID MAPS BEING FILED IN THE OFFICE OF THE COUNTY RECORDER OF CONTRA COSTA COUNTY AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WESTERN LINE OF EIGHTH STREET AS SAID STREET IS SHOWN ON SAID AMENDMENT TO MAP OF ELLIS LANDING, SAID POINT

BEING ALSO THE SOUTHEAST CORNER OF THE 3.39 ACRE STRIP DESCRIBED IN DEED FROM PARR RICHMOND INDUSTRIAL CORPORATION TO THE CITY OF RICHMOND FOR STREET PURPOSES, (SAID PORTION OF SAID STRIP BEING COMMONLY CALLED WRIGHT AVENUE), RECORDED AUGUST 11, 1948, IN BOOK 1272 OF OFFICIAL RECORDS, PAGE 161; THENCE SOUTH $1^{\circ} 26' 21''$ WEST ALONG THE WESTERN LINE OF SAID EIGHTH STREET AND ITS SOUTHERLY PROJECTION 1229.02 FEET TO THE SOUTHERLY LINE OF DOCK AVENUE AS SAID DOCK AVENUE IS SHOWN ON SAID AMENDMENT TO MAP OF ELLIS LANDING; THENCE SOUTH $62^{\circ} 53' 39''$ EAST ALONG SAID SOUTHERLY LINE OF DOCK AVENUE, 15.76 FEET TO THE NORTHERN CORNER OF THE TRACT OF LAND DESCRIBED AS PARCEL ONE IN THE DEED FROM ELLIS LANDING AND DOCK CO., A CORPORATION, TO THE CITY OF RICHMOND, DATED FEBRUARY 10, 1926, RECORDED APRIL 22, 1926, IN BOOK 29 OF OFFICIAL RECORDS, PAGE 283; THENCE SOUTH $4^{\circ} 19' 34''$ EAST ALONG THE WEST LINE OF SAID LAST MENTIONED PARCEL AND ALONG THE WEST LINE OF PARCEL TWO DESCRIBED IN SAID DEED (29 OR 283), 120.30 FEET TO THE NORTHERLY U.S. PIERHEAD AND BULKHEAD LINE OF SAID RICHMOND INNER HARBOR; THENCE NORTH $71^{\circ} 04' 25''$ WEST ALONG SAID NORTHERLY LINE 467.1 FEET TO THE SOUTHERLY EXTENSION OF THE EASTERLY LINE OF THE PARCEL OF LAND DESCRIBED IN DEED FROM PARR RICHMOND INDUSTRIAL CORPORATION TO TIME OIL CO., DATED JUNE 9, 1950 AND RECORDED JUNE 23, 1950, IN BOOK 1580 OF OFFICIAL RECORDS, PAGE 553; THENCE NORTH $2^{\circ} 38' 09''$ WEST ALONG SAID SOUTHERLY EXTENSION AND SAID EASTERLY LINE, 1218.26 FEET TO THE SOUTHERLY LINE OF THE SAID 3.39 ACRE STRIP (1272 OR 161); THENCE SOUTH $88^{\circ} 33' 39''$ EAST ALONG SAID SOUTHERLY LINE, 505.76 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM:

THE PARCEL OF LAND DESCRIBED IN THE DEED TO TIME OIL CO., RECORDED NOVEMBER 23, 1966, BOOK 5250, OFFICIAL RECORDS, PAGE 411.

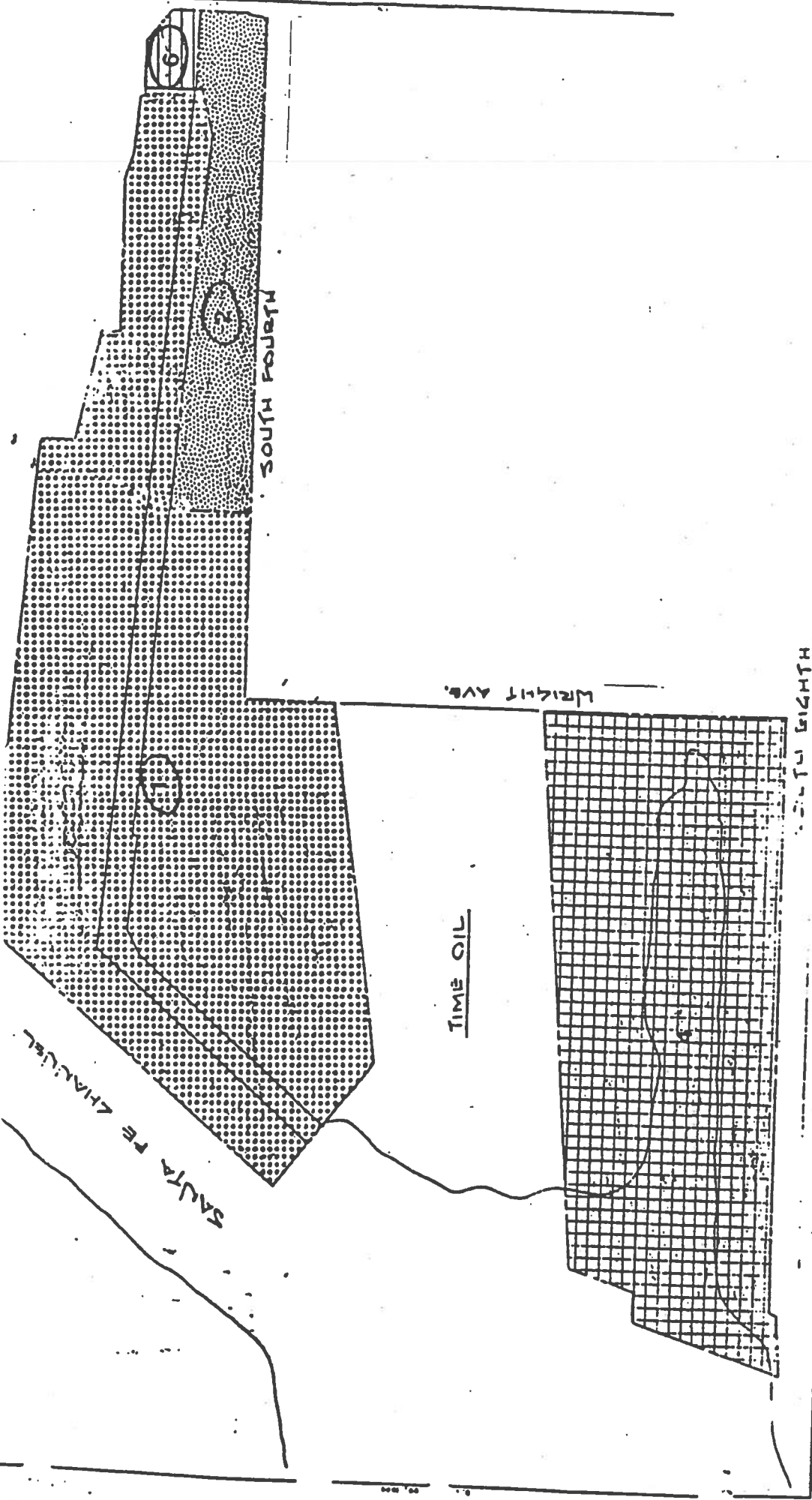
PARCEL 6:



BEGINNING AT THE NORTHWESTERN CORNER OF THE LAND DESIGNATED AS PARCEL 2 IN THE QUIT CLAIM DEED TO PARR-RICHMOND INDUSTRIAL CORPORATION, RECORDED JUNE 1, 1949 IN BOOK 1394 OF OFFICIAL RECORDS OF CONTRA COSTA COUNTY, PAGE 370; RUNNING THENCE ALONG THE NORTHERN LINE OF SAID LAND, BEING THE SOUTHERN LINE OF CUTTING BOULEVARD, EASTERLY, 88.61 FEET TO THE EASTERN LINE OF THE LAND SECONDLY DESCRIBED IN THE DEED TO PARR-RICHMOND TERMINAL CORPORATION, RECORDED DECEMBER 30, 1953, IN BOOK 2681 OF OFFICIAL RECORDS OF CONTRA COSTA COUNTY, PAGE 353; THENCE ALONG THE LAST NAMED LINE SOUTH $1^{\circ} 56'$ WEST, SAID BEARINGS USED FOR THE PURPOSE OF THIS DESCRIPTION, 139.51 FEET AND SOUTH $6^{\circ} 53'$ WEST 38.59 FEET TO THE NORTHERN LINE OF THE LAND FIRSTLY DESCRIBED IN SAID LAST MENTIONED DEED; THENCE ALONG THE LAST NAMED LINE NORTH $89^{\circ} 34'$ WEST 144.10 FEET TO THE WESTERN LINE OF SAID LAND FIRST MENTIONED 1394 OR 370; AND THENCE ALONG THE LAST NAMED LINE NORTH 83 FEET AND NORTH $39^{\circ} 53'$ EAST 84.13 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM:

THAT PORTION THEREOF LYING WITHIN THE LINES OF THE PARCEL OF LAND DESCRIBED AS PARCEL ONE IN THE DEED TO PARR-RICHMOND TERMINAL COMPANY, RECORDED OCTOBER 4, 1951, BOOK 3966, OFFICIAL RECORDS, PAGE 474.



DESIGN	SCALE 1" = 20'
DRAWN BY	DATE 11-6-8
CHECK	BY
DATE	DWA
	NO
	NO

LEVIN RICHMOND TERMINAL CORP. RICHMOND

PARCEL MAP

Levin Group Consent Decree
Appendix F

