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12 UNITED STATES DISTRICT COURT  
 13 CENTRAL DISTRICT OF CALIFORNIA  
 14 WESTERN DIVISION

15 -----  
 16 UNITED STATES OF AMERICA, and the )  
 17 CALIFORNIA DEPARTMENT OF TOXIC )  
 18 SUBSTANCES CONTROL, )  
 19 )  
 20 Plaintiffs, )  
 21 v. ) Civil Action No.  
 22 SHELL OIL COMPANY, ) 2:15-cv-07619-R (AGRx)  
 23 )  
 24 ) CONSENT DECREE  
 25 ) DEL AMO FACILITY  
 26 ) SUPERFUND SITE  
 27 ) SOIL/NAPL OPERABLE UNIT  
 28 ) (OU1)  
 -----

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1 I. BACKGROUND

2 A. The United States of America (“United States”), on behalf of the  
3 Administrator of the United States Environmental Protection Agency (“EPA”),  
4 filed a complaint in this matter pursuant to Sections 106 and 107 of the  
5 Comprehensive Environmental Response, Compensation, and Liability Act  
6 (“CERCLA”), 42 U.S.C. §§ 9606, 9607.  
7  
8

9 B. The United States in its complaint seeks, *inter alia*: (1) reimbursement  
10 of costs incurred by EPA and the Department of Justice (“DOJ”) for response  
11 actions at the Del Amo Facility Superfund Site, in Los Angeles, California (“Site,”  
12 more particularly described in Section IV hereto), together with accrued interest;  
13 and (2) performance of response actions by the Defendant at the Soil and Non-  
14 Aqueous Phase Liquid (“NAPL”) Operable Unit (“Operable Unit 1” or “OU1”) of  
15 the Del Amo Facility Superfund Site consistent with the National Contingency  
16 Plan, 40 C.F.R. Part 300 (“NCP”).  
17  
18  
19  
20

21 C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA,  
22 42 U.S.C. § 9621(f)(1)(F), EPA notified the State of California (the “State”) on  
23 November 29, 2011, of negotiations with potentially responsible parties (“PRPs”)  
24 regarding the implementation of the remedial design and remedial action for  
25 Operable Unit 1 of the Site, and EPA has provided the State with an opportunity to  
26 participate in such negotiations and be a party to this Consent Decree.  
27  
28

1           D.     The State of California Department of Toxic Substances Control  
2 (“DTSC”) has also filed a complaint against the Settling Defendant and the Settling  
3  
4 Federal Agency in this Court alleging that the Settling Defendant and the Settling  
5 Federal Agency are liable to DTSC under Section 107 of CERCLA, 42 U.S.C. §  
6  
7 9607, for reimbursement of costs it has incurred, and will incur, for response  
8  
9 actions at OU1 of the Del Amo Facility Superfund Site together with accrued  
10  
11 interest. Plaintiffs intend to file a motion in this Court to consolidate the separate  
12  
13 actions described in Paragraphs B and D of this Consent Decree.

14           E.     In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C.  
15 § 9622(j)(1), EPA notified the National Oceanic and Atmospheric Administration  
16  
17 and the United States Fish and Wildlife Service on June 13, 2012, of negotiations  
18  
19 with PRPs regarding the release of hazardous substances that may have resulted in  
20  
21 injury to the natural resources under federal trusteeship and encouraged the trustees  
22  
23 to participate in the negotiation of this Consent Decree.

24           F.     The defendant that has entered into this Consent Decree, Shell Oil  
25  
26 Company (“Settling Defendant”), does not admit any liability to Plaintiffs arising  
27  
28 out of the transactions or occurrences alleged in the complaints, nor does it  
acknowledge that the release or threatened release of hazardous substance(s) at or

///

///

1 from the Site constitutes an imminent and substantial endangerment to the public  
2 health or welfare or the environment. Settling Federal Agency does not admit any  
3 liability arising out of the transactions or occurrences alleged in any counterclaim  
4 asserted by Settling Defendant or any claim by DTSC.  
5

6  
7 G. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed  
8 the Site on the National Priorities List (“NPL”), set forth at 40 C.F.R. Part 300,  
9 Appendix B, by publication in the Federal Register on September 7, 2002, 67 Fed.  
10 Reg. 56,760.  
11

12  
13 H. In response to a release or a substantial threat of a release of a  
14 hazardous substance(s) at or from the Site, Shell Oil Company and Dow Chemical  
15 Company, respondents under an Administrative Order on Consent (“AOC  
16 Respondents”), commenced on May 7, 1992, a Remedial Investigation and  
17 Feasibility Study (“RI/FS”) for the Site pursuant to 40 C.F.R. § 300.430.  
18

19  
20 I. AOC Respondents completed a Remedial Investigation (“RI”) Report  
21 on July 7, 2007, and AOC Respondents completed a Feasibility Study (“FS”)   
22 Report on January 15, 2010.  
23

24  
25 J. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA  
26 published notice of the completion of the FS and of the proposed plan for remedial  
27 action on June 15, 2010, in a major local newspaper of general circulation. EPA  
28

1 provided an opportunity for written and oral comments from the public on the  
2 proposed plan for remedial action. A copy of the transcript of the public meeting  
3 is available to the public as part of the administrative record upon which the  
4 Assistant Director, Superfund Division, EPA Region IX, based the selection of the  
5 response action.  
6  
7

8 K. The decision by EPA on the remedial action to be implemented at  
9 Operable Unit 1 is embodied in a final Record of Decision (“ROD”), executed on  
10 September 30, 2011, on which DTSC has given its concurrence. The ROD  
11 includes a responsiveness summary to the public comments. Notice of the final  
12 plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C.  
13 § 9617(b). EPA supplemented the ROD with a Memorandum to File dated July  
14 26, 2013.  
15  
16  
17

18 L. Based on the information presently available to EPA and DTSC, EPA  
19 and DTSC believe that the Work will be properly and promptly conducted by  
20 Settling Defendant if conducted in accordance with the requirements of this  
21 Consent Decree and its appendices.  
22  
23

24 M. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C.  
25 § 9613(j), the remedy set forth in the ROD and the Work to be performed by  
26 Settling Defendant shall constitute a response action taken or ordered by the  
27  
28

1 President for which judicial review shall be limited to the administrative record.

2  
3 N. During the 1940s and 1950s, the Defense Plant Corporation (“DPC”)  
4 and the Rubber Reserve Company (“RRC”) owned all or part of the Site and were  
5 involved in activities relating to the possible generation, disposal, and release of  
6 hazardous substances into the environment at and from the Site. The General  
7 Services Administration (“GSA”) inherited any potential CERCLA liability  
8 attributed to DPC and RRC activities through Reorganization Plan No. 1, June 30,  
9 1957, 22 Fed. Reg. 4633; and as directed by the Reorganization Act of 1949, 63  
10 Stat. 203, 5 U.S.C. § 901. It is because of this presidential and legislative  
11 delegation of responsibility that GSA is the Settling Federal Agency in this  
12 Consent Decree.  
13  
14  
15  
16

17 O. The Site also includes Operable Unit 2 (“OU2”), known as the Waste  
18 Pits OU, for which a remedial action was selected by EPA in the Del Amo Waste  
19 Pits Operable Unit Record of Decision on September 5, 1997, and Operable Unit 3  
20 (“OU3”), known as the Dual Site Groundwater OU, for which a remedial action  
21 was selected by EPA in the Dual Site Groundwater Operable Unit Del Amo and  
22 Montrose Chemical Superfund Sites Record of Decision, on March 1, 1999.  
23  
24  
25

26 P. The Parties recognize, and the Court by entering this Consent Decree  
27 finds, that this Consent Decree has been negotiated by the Parties in good faith and  
28



1 implementation of this Consent Decree will expedite the cleanup of the Site and  
2 will avoid prolonged and complicated litigation between the Parties, and that this  
3 Consent Decree is fair, reasonable, and in the public interest.  
4

5 NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:  
6

7 II. JURISDICTION  
8

9 1. This Court has jurisdiction over the subject matter of this action  
10 pursuant to 28 U.S.C. §§ 1331, 1367, and 1345, and 42 U.S.C. §§ 9606, 9607, and  
11 9613(b). This Court also has personal jurisdiction over Settling Defendant. Solely  
12 for the purposes of this Consent Decree and the underlying complaints, Settling  
13 Defendant waives all objections and defenses that it may have to jurisdiction of the  
14 Court or to venue in this District. Settling Defendant shall not challenge the terms  
15 of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent  
16 Decree.  
17  
18  
19

20 III. PARTIES BOUND  
21

22 2. This Consent Decree applies to and is binding upon the United States  
23 and DTSC and upon Settling Defendant and its successors, and assigns. Any  
24 change in ownership or corporate status of Settling Defendant including, but not  
25 limited to, any transfer of assets or real or personal property, shall in no way alter  
26 Settling Defendant's responsibilities under this Consent Decree.  
27  
28



1 “2014 Settlement Agreement” shall mean the 2014 Settlement Agreement  
2 and Order on Consent entered in *Shell Oil Company v. United States*, Civil Case  
3 No. 93-4584 MRP (C.D. Cal.).  
4

5 “CERCLA” shall mean the Comprehensive Environmental Response,  
6 Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.  
7

8 “Consent Decree” shall mean this Consent Decree and all appendices  
9 attached hereto (listed in Section XXVIII). In the event of conflict between this  
10 Consent Decree and any appendix, this Consent Decree shall control.  
11  
12

13 “Day” or “day” shall mean a calendar day unless expressly stated to be a  
14 working day. The term “working day” shall mean a day other than a Saturday,  
15 Sunday, or federal or state holiday. In computing any period of time under this  
16 Consent Decree, where the last day would fall on a Saturday, Sunday, or federal or  
17 state holiday, the period shall run until the close of business of the next working  
18 day.  
19  
20  
21

22 “Del Amo Superfund Site Special Account” shall mean the special account,  
23 within the EPA Hazardous Substance Superfund, established for the Del Amo  
24 Superfund Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C.  
25 § 9622(b)(3).  
26  
27  
28

1 “DOJ” shall mean the United States Department of Justice and its successor  
2 departments, agencies, or instrumentalities.  
3

4 “DTSC” shall mean the California Department of Toxic Substances Control,  
5 and its successor departments, agencies, or instrumentalities.  
6

7 “DTSC Future Response Costs” shall mean all costs, including, but not  
8 limited to, direct and indirect costs, that the DTSC incurs in reviewing or  
9 developing plans, reports, and other deliverables submitted pursuant to this  
10 Consent Decree, in overseeing implementation of the Work, or otherwise  
11 implementing, overseeing, or enforcing this Consent Decree, including, but not  
12 limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs  
13 incurred pursuant to Sections VII (Remedy Review), IX (Access and Institutional  
14 Controls) (including, but not limited to, the cost of attorney time and any monies  
15 paid to secure access and/or to secure, implement, monitor, maintain, or enforce  
16 Institutional Controls including, but not limited to, the amount paid as just  
17 compensation for a property interest), and XV (Emergency Response),  
18 Paragraph 45 (Funding for Work Takeover), and Section XXIX (Community  
19 Involvement). DTSC Future Response Costs shall also include all Interest on those  
20 DTSC Past Response Costs that has accrued pursuant to 42 U.S.C. § 9607(a)  
21 during the period from September 30, 2013 to the Effective Date.  
22  
23  
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1 “DTSC Past Response Costs” shall mean all costs, including, but not limited  
2 to, direct and indirect costs, that DTSC paid at or in connection with Operable Unit  
3  
4 1 through September 30, 2013.

5 “Effective Date” shall mean the date upon which this Consent Decree is  
6  
7 entered by the Court as recorded on the Court docket, or, if the Court instead issues  
8  
9 an order approving the Consent Decree, the date such order is recorded on the  
10  
11 Court docket.

12 “EPA” shall mean the United States Environmental Protection Agency and  
13  
14 its successor departments, agencies, or instrumentalities.

15 “EPA Hazardous Substance Superfund” shall mean the Hazardous  
16  
17 Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

18 “Future Response Costs” shall mean all costs, including, but not limited to,  
19  
20 direct and indirect costs, that the United States incurs in reviewing or developing  
21  
22 plans, reports, and other deliverables submitted pursuant to this Consent Decree, in  
23  
24 overseeing implementation of the Work, or otherwise implementing, overseeing, or  
25  
26 enforcing this Consent Decree, including, but not limited to, payroll costs,  
27  
28 contractor costs, travel costs, laboratory costs, the costs incurred pursuant to  
Sections VII (Remedy Review), IX (Access and Institutional Controls) (including,  
but not limited to, the cost of attorney time and any monies paid to secure access

1 and/or to secure, implement, monitor, maintain, or enforce Institutional Controls  
2 including, but not limited to, the amount paid as just compensation for a property  
3 interest), and XV (Emergency Response), Paragraph 45 (Funding for Work  
4 Takeover), and Section XXIX (Community Involvement). Future Response Costs  
5 shall also include all Interim Response Costs, and all Interest on those Past  
6 Response Costs Settling Defendant has agreed to pay under this Consent Decree  
7 that has accrued pursuant to 42 U.S.C. § 9607(a) during the period from April 1,  
8 2013 to the Effective Date.  
9  
10  
11

12 “Institutional Controls” or “ICs” shall mean Proprietary Controls and state  
13 or local laws, regulations, ordinances, zoning restrictions, or other governmental  
14 controls, or notices that: (a) limit land, water, and/or resource use to minimize the  
15 potential for human exposure to Waste Material at or in connection with the Site;  
16 (b) limit land, water, and/or resource use to implement, ensure non-interference  
17 with, or ensure the protectiveness of the Remedial Action; and/or (c) provide  
18 information intended to modify or guide human behavior at or in connection with  
19 the Site.  
20  
21  
22  
23

24 “Institutional Control Implementation and Assurance Plan” or “ICIAP” shall  
25 mean the plan for implementing, maintaining, monitoring, and reporting on the  
26 Institutional Controls set forth in the ROD, prepared in accordance with the  
27 Statement of Work (“SOW”).  
28

1 “Interim Response Costs” shall mean all costs, including, but not limited to,  
2 direct and indirect costs, (a) paid by the United States in connection with Operable  
3 Unit 1 between September 30, 2011 and the Effective Date, or (b) incurred prior to  
4 the Effective Date but paid after that date.  
5

6  
7 “Interest” shall mean interest at the rate specified for interest on investments  
8 of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507,  
9 compounded annually on October 1 of each year, in accordance with 42 U.S.C.  
10 § 9607(a). The applicable rate of interest shall be the rate in effect at the time the  
11 interest accrues. The rate of interest is subject to change on October 1 of each  
12 year.  
13  
14

15  
16 “National Contingency Plan” or “NCP” shall mean the National Oil and  
17 Hazardous Substances Pollution Contingency Plan promulgated pursuant to  
18 Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and  
19 any amendments thereto.  
20

21  
22 “Operable Unit 1” or “OU1” shall mean the Soil and NAPL Operable Unit  
23 of the Del Amo Superfund Site, but not including the areas reflected in the ROD as  
24 Properties 29 and 34.  
25

26 “Operation and Maintenance” or “O&M” shall mean all activities required  
27 to maintain the effectiveness of the Remedial Action as required under the  
28

1 Operation and Maintenance Plan approved or developed by EPA pursuant to  
2 Section VI (Performance of the Work by Settling Defendant) and the SOW, and  
3 maintenance, monitoring, and enforcement of Institutional Controls as provided in  
4 the ICIAP.  
5

6  
7 “Paragraph” shall mean a portion of this Consent Decree identified by an  
8 Arabic numeral or an upper or lower case letter.  
9

10 “Parties” shall mean the United States, DTSC, and Settling Defendant.  
11

12 “Past Response Costs” shall mean all costs, including, but not limited to,  
13 direct and indirect costs, that the United States paid at or in connection with the  
14 Site, except for OU3, through September 30, 2011, plus Interest on all such costs  
15 that has accrued pursuant to 42 U.S.C. § 9607(a) through such date.  
16

17  
18 “Performance Standards” shall mean the cleanup standards and other  
19 measures of achievement of the goals of the Remedial Action, set forth in the ROD  
20 and the SOW and any modified standards established pursuant to this Consent  
21 Decree.  
22

23  
24 “Plaintiffs” shall mean the United States and DTSC.

25  
26 “Proprietary Controls” shall mean easements or covenants running with the  
27 land that (a) limit land, water, or resource use and/or provide access rights and (b)  
28



1 are created pursuant to common law or statutory law by an instrument that is  
2 recorded in the appropriate land records office.  
3

4 “RCRA” shall mean the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992  
5 (also known as the Resource Conservation and Recovery Act).  
6

7 “Record of Decision” or “ROD” shall mean the EPA Record of Decision  
8 relating to the Soil and NAPL Operable Unit at the Site signed on September 30,  
9 2011, by the Assistant Director, Superfund Division, EPA Region IX, and all  
10 attachments thereto, and revised as per Memo to File dated July 26, 2013. The  
11 ROD is attached as Appendix A.  
12  
13

14 “Remedial Action” shall mean all activities Settling Defendant is required to  
15 perform under the Consent Decree to implement the ROD, in accordance with the  
16 SOW, the final approved remedial design submission, the approved Remedial  
17 Action Work Plan, and other plans approved by EPA, including implementation of  
18 Institutional Controls, until the Performance Standards are met, and excluding  
19 performance of the Remedial Design, O&M, and the activities required under  
20 Section XXV (Retention of Records).  
21  
22  
23

24 “Remedial Action Work Plan” shall mean the document developed pursuant  
25 to Paragraph 11 (Remedial Action) and approved by EPA, and any modifications  
26 thereto.  
27  
28

1 “Remedial Design” shall mean those activities to be undertaken by Settling  
2 Defendant to develop the final plans and specifications for the Remedial Action  
3 pursuant to the Remedial Design Work Plan.  
4

5 “Remedial Design Work Plan” shall mean the document developed pursuant  
6 to Paragraph 10 (Remedial Design) and approved by EPA, and any modifications  
7 thereto.  
8

9  
10 “Section” shall mean a portion of this Consent Decree identified by a Roman  
11 numeral.  
12

13 “Settling Defendant” shall mean Shell Oil Company.  
14

15 “Settling Defendant’s Future Response Costs” shall mean all necessary  
16 response costs Settling Defendant incurs in implementing this Consent Decree,  
17 including, but not limited to, the costs incurred pursuant to Section VI  
18 (Performance of the Work by Settling Defendant), Section VII (Remedy Review),  
19 Section IX (Access and Institutional Controls), and Section XIII (Performance  
20 Guarantee).  
21  
22

23 “Settling Defendant’s Past Response Costs” shall mean all necessary  
24 response costs Settling Defendant has incurred in connection with Operable Unit 1  
25 through December 31, 2012.  
26  
27  
28

1 “Settling Federal Agency” shall mean the General Services Administration  
2 (“GSA”) and its successor departments, agencies, or instrumentalities.  
3

4 “Site” shall mean the Del Amo Facility Superfund Site, encompassing  
5 approximately 280 acres, which includes the former location of a synthetic rubber  
6 plant, located in the Harbor Gateway area of Los Angeles, California, and depicted  
7 generally on the map attached as Appendix C.  
8

9  
10 “State” shall mean the State of California.  
11

12 “Statement of Work” or “SOW” shall mean the statement of work for  
13 implementation of the Remedial Design, Remedial Action, and O&M at Operable  
14 Unit 1, as set forth in Appendix B to this Consent Decree and any modifications  
15 made in accordance with this Consent Decree.  
16

17  
18 “Supervising Contractor” shall mean the principal contractor retained by  
19 Settling Defendant to supervise and direct the implementation of the Work under  
20 this Consent Decree.  
21

22 “United States” shall mean the United States of America and each  
23 department, agency, and instrumentality of the United States, including EPA and  
24 the Settling Federal Agency.  
25

26  
27 “Waste Material” shall mean (1) any “hazardous substance” under  
28 Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or

1 contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any  
2 “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (4) any  
3  
4 “hazardous substance” under California Health and Safety Code Section 25316.

5 “Work” shall mean all activities and obligations Settling Defendant is  
6  
7 required to perform under this Consent Decree, except the activities required under  
8  
9 Section XXV (Retention of Records).

10 V. GENERAL PROVISIONS

11  
12 5. Objectives of the Parties. The objectives of the Parties in entering  
13 into this Consent Decree are to protect public health or welfare or the environment  
14 by the design and implementation of response actions at Operable Unit 1 by  
15 Settling Defendant, to pay response costs of the Plaintiffs, to acknowledge Settling  
16 Federal Agency’s obligation to pay (through reimbursement to Settling Defendant  
17 under the 2014 Settlement Agreement) a portion of Plaintiffs’ response costs and  
18 other recoverable response costs incurred by Settling Defendant hereunder, and to  
19 resolve the claims of Plaintiffs against Settling Defendant and the claims of DTSC  
20 and Settling Defendant that have been or could have been asserted against the  
21 United States with regard to Operable Unit 1 as provided in this Consent Decree.  
22  
23  
24  
25

26 6. Commitments by Settling Defendant and Settling Federal Agency.  
27 Settling Defendant shall finance and perform the Work in accordance with this  
28

1 Consent Decree, the ROD, the SOW, and all work plans and other plans, standards,  
2 specifications, and schedules set forth in this Consent Decree or developed by  
3  
4 Settling Defendant and approved by EPA, after reasonable opportunity for review  
5 and comment by DTSC, pursuant to this Consent Decree. Settling Defendant shall  
6  
7 pay the United States for Past Response Costs and Future Response Costs, and  
8  
9 Settling Defendant shall pay DTSC for the DTSC Past Response Costs and DTSC  
10  
11 Future Response Costs, as provided in this Consent Decree. Settling Federal  
12  
13 Agency shall reimburse Settling Defendant for a portion of: Past Response Costs  
14  
15 and Future Response Costs, DTSC Past Response Costs and DTSC Future  
16  
17 Response Costs, and Settling Defendant's Future Response Costs, pursuant to the  
18  
19 2014 Settlement Agreement.

17       7.     Compliance With Applicable Law. All activities undertaken by  
18  
19 Settling Defendant pursuant to this Consent Decree shall be performed in  
20  
21 accordance with the requirements of all applicable federal and state laws and  
22  
23 regulations. Settling Defendant must also comply with all applicable or relevant  
24  
25 and appropriate requirements of all federal and state environmental laws as set  
26  
27 forth in the ROD and the SOW. The activities conducted pursuant to this Consent  
28  
Decree, if approved by EPA, shall be deemed to be consistent with the NCP.

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8. Permits.

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-Site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-Site requires a federal or state permit or approval, Settling Defendant shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. Settling Defendant may seek relief under the provisions of Section XVIII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in Paragraph 8.a and required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

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

1 VI. PERFORMANCE OF THE WORK BY SETTLING DEFENDANT

2  
3 9. Selection of Supervising Contractor.

4 a. All aspects of the Work to be performed by Settling Defendant  
5  
6 pursuant to Sections VI (Performance of the Work by Settling Defendant), VII  
7 (Remedy Review), VIII (Quality Assurance, Sampling, and Data Analysis),  
8  
9 IX (Access and Institutional Controls), and XV (Emergency Response) shall be  
10 under the direction and supervision of the Supervising Contractor, the selection of  
11  
12 which shall be subject to disapproval by EPA after a reasonable opportunity for  
13 review and comment by DTSC. Within ten days after the lodging of this Consent  
14 Decree, Settling Defendant shall notify EPA and DTSC in writing of the name,  
15  
16 title, and qualifications of any contractor proposed to be the Supervising  
17 Contractor. With respect to any contractor proposed to be Supervising Contractor,  
18  
19 Settling Defendant shall demonstrate that the proposed contractor has a quality  
20 assurance system that complies with ANSI/ASQC E4-1994, "Specifications and  
21 Guidelines for Quality Systems for Environmental Data Collection and  
22  
23 Environmental Technology Programs" (American National Standard, January  
24 5, 1995), by submitting a copy of the proposed contractor's Quality Management  
25 Plan ("QMP"). The QMP should be prepared in accordance with "EPA  
26 Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002,  
27  
28 March 2001, reissued May 2006) or equivalent documentation as determined by

1 EPA. EPA will issue a notice of disapproval or an authorization to proceed  
2 regarding hiring of the proposed contractor. If at any time thereafter, Settling  
3 Defendant proposes to change a Supervising Contractor, Settling Defendant shall  
4 give such notice to EPA and DTSC and must obtain an authorization to proceed  
5 from EPA, after a reasonable opportunity for review and comment by DTSC,  
6 before the new Supervising Contractor performs, directs, or supervises any Work  
7 under this Consent Decree. Settling Defendant shall demonstrate that the proposed  
8 replacement contractor has a quality assurance system that complies with  
9 ANSI/ASQC E4-1994, “Specifications and Guidelines for Quality Systems for  
10 Environmental Data Collection and Environmental Technology Programs”  
11 (American National Standard, January 5, 1995), by submitting a copy of the  
12 proposed contractor’s QMP. The QMP should be prepared in accordance with  
13 “EPA Requirements for Quality Management Plans (QA/R-2)” (EPA/240/B-  
14 01/002, March 2001, reissued May 2006) or equivalent documentation as  
15 determined by EPA.  
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21

22           b. If EPA disapproves a proposed Supervising Contractor, EPA  
23 will notify Settling Defendant in writing. Settling Defendant shall submit to EPA  
24 and DTSC a list of contractors, including the qualifications of each contractor that  
25 would be acceptable to them, within 30 days after receipt of EPA’s disapproval of  
26 the contractor previously proposed. EPA will provide written notice of the names  
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1 of any contractor(s) that it disapproves and an authorization to proceed with  
2 respect to any of the other contractors. Settling Defendant may select any  
3 contractor from that list that is not disapproved and shall notify EPA and DTSC of  
4 the name of the contractor selected within 21 days after EPA's authorization to  
5 proceed.  
6  
7

8 c. If EPA fails to provide written notice of its authorization to  
9 proceed or disapproval as provided in this Paragraph and this failure prevents  
10 Settling Defendant from meeting one or more deadlines in a plan approved by EPA  
11 pursuant to this Consent Decree, Settling Defendant may seek relief under Section  
12 XVIII (Force Majeure).  
13  
14

15  
16 10. Remedial Design.

17 a. Within 90 days after EPA's issuance of an authorization to  
18 proceed pursuant to Paragraph 9 (Selection of Supervising Contractor), Settling  
19 Defendant shall submit to EPA and DTSC a work plan for the design of the  
20 Remedial Action at Operable Unit 1 ("Remedial Design Work Plan"). The  
21 Remedial Design Work Plan shall provide for design of the remedy set forth in the  
22 ROD, in accordance with the SOW and for achievement of the Performance  
23 Standards and other requirements set forth in the ROD, this Consent Decree,  
24 and/or the SOW. Upon its approval by EPA, after a reasonable opportunity for  
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1 review and comment by DTSC, the Remedial Design Work Plan shall be  
2 incorporated into and enforceable under this Consent Decree. Within 30 days after  
3  
4 EPA's approval of the Remedial Design Work Plan, Settling Defendant shall  
5 submit to EPA and DTSC a Health and Safety Plan/Contingency Plan for field  
6  
7 design activities that conforms to the applicable Occupational Safety and Health  
8 Administration and EPA requirements including, but not limited to, 29 C.F.R.  
9 § 1910.120. Also within 120 days after EPA's approval of the Remedial Design  
10  
11 Work Plan, Settling Defendant shall submit to EPA and DTSC the Pre-Design  
12 Investigation Work Plan.

13  
14 b. The Remedial Design Work Plan shall include plans and  
15 schedules for implementation of all remedial design and pre-design tasks identified  
16  
17 in the SOW, including, but not limited to, plans and schedules for the completion  
18 of:

- 19  
20 (1) Pre-Design Investigation Work Plan(s) and Report(s)  
21 (including, but not limited to, a Quality Assurance Project Plan in  
22 accordance with Section VIII (Quality Assurance, Sampling, and Data  
23 Analysis)). Pre-design investigation activities will include activities  
24 necessary to assess the area receiving a remedial component;  
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1 (2) bench/pilot study work plan(s) and report(s) to address  
2 data gaps and/or obtain new data to allow pre-design activities to proceed;  
3

4 (3) work-specific health and safety plans for any design  
5 investigation field work;  
6

7 (4) an Institutional Controls Implementation and Assurance  
8 Plan (“ICIAP”);  
9

10 (5) a preliminary design submission; and  
11

12 (6) a pre-final and final design.  
13

14 In addition, the Remedial Design Work Plan shall include a schedule  
15 for completion of the Remedial Action Work Plan.  
16

17 c. Upon approval of the Remedial Design Work Plan by EPA,  
18 after a reasonable opportunity for review and comment by DTSC, and submission  
19 of the Health and Safety Plan/Contingency Plan for all field activities to EPA and  
20 DTSC, Settling Defendant shall implement the Remedial Design Work Plan.  
21 Settling Defendant shall submit to EPA and DTSC all plans, reports, and other  
22 deliverables required under the approved Remedial Design Work Plan in  
23 accordance with the approved schedule for review and approval pursuant to  
24 Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Unless  
25 otherwise directed by EPA, Settling Defendant shall not commence further  
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1 Remedial Design activities at Operable Unit 1 prior to approval of the Remedial  
2 Design Work Plan.  
3

4 d. The preliminary design submission shall include, at a  
5 minimum, the following: (1) design criteria; (2) results of bench/pilot studies;  
6 (3) results of pre-design investigation and pre-design work; (4) value engineering  
7 analysis; (5) sustainability evaluation; (6) project delivery strategy; (7) preliminary  
8 plans, drawings, and sketches; (8) required specifications in outline form; and  
9 (9) preliminary construction schedule.  
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11

12 e. The pre-final/final design submission shall include, at a  
13 minimum, the following: (1) final plans and specifications; (2) Operation and  
14 Maintenance Plan; (3) Construction Quality Assurance Plan (“CQAP”); and (4)  
15 schedule. The CQAP, which shall detail the approach to quality assurance during  
16 construction activities at Operable Unit 1, shall specify a quality assurance official,  
17 independent of the Supervising Contractor, to conduct a quality assurance program  
18 during the construction phase of the project.  
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22

23 11. Remedial Action.

24 a. Within 120 days after the approval of the final design  
25 submission, Settling Defendant shall submit to EPA and DTSC a work plan for the  
26 performance of the Remedial Action at Operable Unit 1 (“Remedial Action Work  
27  
28

1 Plan”). The Remedial Action Work Plan shall provide for construction and  
2 implementation of the remedy set forth in the ROD and achievement of the  
3  
4 Performance Standards, in accordance with this Consent Decree, the ROD, the  
5 SOW and the plans and specifications developed in accordance with the Remedial  
6 Design Work Plan and approved by EPA. Upon its approval by EPA, after a  
7 reasonable opportunity for review and comment by DTSC, the Remedial Action  
8 Work Plan shall be incorporated into and enforceable under this Consent Decree.  
9  
10 As part of the Remedial Action Work Plan, Settling Defendant shall include a  
11 discussion of, and schedule for, submission of associated deliverables (see Section  
12 VI.A.2. of the SOW).  
13  
14

15           b.       The Remedial Action Work Plan shall include the following:  
16

- 17                   (1)    schedule for completion of the Remedial Action;  
18  
19                   (2)    method for selection of the contractor;  
20  
21                   (3)    schedule for developing and submitting any other  
22 required Remedial Action plans;  
23  
24                   (4)    methods for satisfying permitting requirements, if  
25 applicable;  
26  
27                   (5)    schedule for finalizing the Operation and Maintenance  
28 Plan;

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- (6) identified members of the Remedial Action team;
- (7) schedule for preparation of a site-wide management plan;
- (8) schedule for preparation of a performance monitoring and evaluation plan;
- (9) schedule for preparation of construction-specific health and safety plans/contingency plans;
- (10) schedule for finalizing a CQAP; and
- (11) schedule for preparation of a waste transportation and off-site disposal plan.

c. Upon approval of the Remedial Action Work Plan by EPA, after a reasonable opportunity for review and comment by DTSC, Settling Defendant shall implement the activities required under the Remedial Action Work Plan. Settling Defendant shall submit to EPA and DTSC all reports and other deliverables required under the approved Remedial Action Work Plan in accordance with the approved schedule for review and approval pursuant to Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Unless otherwise directed by EPA, Settling Defendant shall not commence physical Remedial Action activities at Operable Unit 1 prior to approval of the Remedial Action Work Plan.

1           12.    Settling Defendant shall continue to implement the Remedial Action  
2 until the Performance Standards are achieved. Settling Defendant shall implement  
3 O&M for so long thereafter as is required by this Consent Decree and the SOW.  
4

5           13.    Modification of SOW or Related Work Plans.  
6

7           a.     If EPA, following reasonable opportunity for review and  
8 comment by DTSC, determines that it is necessary to modify the work specified in  
9 the SOW and/or in work plans developed pursuant to the SOW to achieve and  
10 maintain the Performance Standards or to carry out and maintain the effectiveness  
11 of the remedy set forth in the ROD, and such modification is consistent with the  
12 scope of the remedy set forth in the ROD, then EPA may issue such modification  
13 in writing and shall notify Settling Defendant of such modification. For the  
14 purposes of this Paragraph and Paragraphs 47 (Completion of the Remedial  
15 Action) and 48 (Completion of the Work) only, the “scope of the remedy set forth  
16 in the ROD” is composed of the ROD requirements, including but not limited to  
17 the following elements, as described more specifically in the ROD: institutional  
18 controls (“ICs”), including informational outreach and building permit review for  
19 all of OU1, a General Plan footnote and restrictive covenants for Areas 2, 4-17, 19,  
20 20, 22-24, 28, 30, 32, 33, 35, and 36; capping for VOC- and non-VOC-impacted  
21 shallow outdoor soils on properties 2, 16, 28, and 35; building engineering controls  
22 (“BECs”) at property 16; soil vapor extraction (“SVE”) for VOC-impacted outdoor  
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1 shallow soils at properties 6, 11, and 23, and for VOC-impacted soil under the  
2 building on property 23; SVE for vadose zone soil in NAPL Source Area SA-6,  
3 located on property 23, a NAPL-impacted groundwater contamination source area;  
4 in situ chemical oxidation (“ISCO”) and SVE for deep soil and groundwater in  
5 NAPL source areas SA-3, SA-11, and SA-12; and excavation and off-site disposal,  
6 or ICs and capping, SVE, or BECs, for areas of Site-related contamination, as  
7 described in Section 12.2.8 of the ROD, that are encountered after the Effective  
8 Date of this Consent Decree. If Settling Defendant objects to the modification it  
9 may, within 30 days after EPA’s notification, seek dispute resolution under  
10 Paragraph 68 (Record Review).

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15           b.       The SOW and/or related work plans shall be modified: (1) in  
16 accordance with the modification issued by EPA; or (2) if Settling Defendant  
17 invokes dispute resolution, in accordance with the final resolution of the dispute.  
18 The modification shall be incorporated into and enforceable under this Consent  
19 Decree, and Settling Defendant shall implement all work required by such  
20 modification. Settling Defendant shall incorporate the modification into the  
21 Remedial Design or Remedial Action Work Plan under Paragraph 10 (Remedial  
22 Design) or Paragraph 11 (Remedial Action), as appropriate.  
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1           c.       Nothing in this Paragraph shall be construed to limit EPA's  
2 authority to require performance of further response actions as otherwise provided  
3 in this Consent Decree.  
4

5           d.       Nothing in this Paragraph shall be construed to limit the State's  
6 authority to require performance of further response actions as provided by  
7 California or federal law.  
8

9  
10         14.     Nothing in this Consent Decree, the SOW, or the Remedial Design or  
11 Remedial Action Work Plans constitutes a warranty or representation of any kind  
12 by Plaintiffs that compliance with the work requirements set forth in the SOW and  
13 the Work Plans will achieve the Performance Standards.  
14

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16         15.     Off-Site Shipment of Waste Material.  
17

18           a.       Settling Defendant may ship Waste Material from the Site to an  
19 off-Site facility only if it verifies, prior to any shipment, that the off-Site facility is  
20 operating in compliance with the requirements of Section 121(d)(3) of CERCLA,  
21 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440, by obtaining a determination  
22 from EPA that the proposed receiving facility is operating in compliance with  
23 42 U.S.C. § 9621(d)(3) and 40 C.F.R. § 300.440.  
24

25  
26           b.       Settling Defendant may ship Waste Material from the Site to an  
27 out-of-state waste management facility only if, prior to any shipment, it provides  
28

1 written notice to the appropriate state environmental official in the receiving  
2 facility's state and to the EPA Project Coordinator. This notice requirement shall  
3 not apply to any off-Site shipments when the total quantity of all such shipments  
4 will not exceed ten cubic yards. The written notice shall include the following  
5 information, if available: (1) the name and location of the receiving facility; (2) the  
6 type and quantity of Waste Material to be shipped; (3) the schedule for the  
7 shipment; and (4) the method of transportation. Settling Defendant also shall  
8 notify the state environmental official referenced above and the EPA Project  
9 Coordinator of any major changes in the shipment plan, such as a decision to ship  
10 the Waste Material to a different out-of-state facility. Settling Defendant shall  
11 provide the written notice after the award of the contract for Remedial Action  
12 construction and before the Waste Material is shipped.  
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## 18 VII. REMEDY REVIEW

19  
20 16. Periodic Review. Settling Defendant shall conduct any studies and  
21 investigations that EPA requests in order to permit EPA to conduct reviews of  
22 whether the Remedial Action is protective of human health and the environment at  
23 least every five years as required by Section 121(c) of CERCLA, 42 U.S.C.  
24 § 9621(c), and any applicable regulations.  
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1           17.    EPA Selection of Further Response Actions.  If EPA determines, at  
2 any time, that the Remedial Action is not protective of human health and the  
3 environment, EPA may select further response actions for the Site in accordance  
4 with the requirements of CERCLA and the NCP.  
5

6  
7           18.    Opportunity to Comment.  Settling Defendant and, if required by  
8 Sections 113(k)(2) or 117 of CERCLA, 42 U.S.C. § 9613(k)(2) or 9617, the public,  
9 will be provided with an opportunity to comment on any further response actions  
10 proposed by EPA as a result of the review conducted pursuant to Section 121(c) of  
11 CERCLA and to submit written comments for the record during the comment  
12 period.  
13  
14

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16           VIII.  QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

17           19.    Quality Assurance.

18  
19           a.       Settling Defendant shall use quality assurance, quality control,  
20 and chain of custody procedures for all treatability, design, compliance, and  
21 monitoring samples in accordance with “EPA Requirements for Quality Assurance  
22 Project Plans (QA/R5)” (EPA/240/B-01/003, March 2001, reissued May 2006),  
23 “Guidance for Quality Assurance Project Plans (QA/G-5)” (EPA/240/R-02/009,  
24 December 2002), and subsequent amendments to such guidelines upon notification  
25  
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1 by EPA to Settling Defendant of such amendment. Amended guidelines shall  
2 apply only to procedures conducted after such notification.  
3

4           b. Prior to the commencement of any monitoring project under  
5 this Consent Decree, Settling Defendant shall submit to EPA for approval, after a  
6 reasonable opportunity for review and comment by DTSC, a Quality Assurance  
7 Project Plan (“QAPP”) that is consistent with the SOW, the NCP, and applicable  
8 guidance documents. If relevant to the proceeding, the Parties agree that validated  
9 sampling data generated in accordance with the QAPP(s) and reviewed and  
10 approved by EPA shall be admissible as evidence, without objection, in any  
11 proceeding under this Consent Decree. Settling Defendant shall ensure that EPA  
12 and DTSC personnel and their authorized representatives are allowed access at  
13 reasonable times to all laboratories utilized by Settling Defendant in implementing  
14 this Consent Decree. In addition, Settling Defendant shall ensure that such  
15 laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for  
16 quality assurance monitoring. Settling Defendant shall ensure that the laboratories  
17 it utilizes for the analysis of samples taken pursuant to this Consent Decree  
18 perform all analyses according to accepted EPA methods. Accepted EPA methods  
19 consist of those methods that are documented in the “USEPA Contract Laboratory  
20 Program Statement of Work for Inorganic Analysis, ILM05.4,” and the “USEPA  
21 Contract Laboratory Program Statement of Work for Organic Analysis,  
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1 SOM01.2,” and any amendments made thereto during the course of the  
2 implementation of this Consent Decree; however, upon approval by EPA, after  
3  
4 opportunity for review and comment by DTSC, Settling Defendant may use other  
5 analytical methods that are as stringent as or more stringent than the CLP-approved  
6  
7 methods. Settling Defendant shall ensure that all laboratories it uses for analysis of  
8  
9 samples taken pursuant to this Consent Decree participate in an EPA or EPA-  
10  
11 equivalent quality assurance/quality control (“QA/QC”) program. Settling  
12  
13 Defendant shall use only laboratories that have a documented Quality System that  
14  
15 complies with ANSI/ASQC E4-1994, “Specifications and Guidelines for Quality  
16  
17 Systems for Environmental Data Collection and Environmental Technology  
18  
19 Programs” (American National Standard, January 5, 1995), and “EPA  
20  
21 Requirements for Quality Management Plans (QA/R-2)” (EPA/240/B-01/002,  
22  
23 March 2001, reissued May 2006) or equivalent documentation as determined by  
24  
25 EPA. EPA may consider laboratories accredited under the National Environmental  
26  
27 Laboratory Accreditation Program (“NELAP”) as meeting the Quality System  
28  
requirements. Settling Defendant shall ensure that all field methodologies utilized  
in collecting samples for subsequent analysis pursuant to this Consent Decree are  
conducted in accordance with the procedures set forth in the QAPP approved by  
EPA.

1           20. Upon request, Settling Defendant shall allow split or duplicate  
2 samples to be taken by EPA and DTSC or their authorized representatives.  
3  
4 Settling Defendant shall notify EPA and DTSC not less than 28 days in advance of  
5 any sample collection activity unless shorter notice is agreed to by EPA.  
6  
7 Schedules within workplans submitted to EPA and DTSC can be considered to  
8 constitute notification. In addition, EPA and DTSC shall have the right to take any  
9 additional samples that EPA or DTSC deems necessary. EPA and DTSC shall  
10 notify Settling Defendant not less than 14 days in advance of any sample collection  
11 activity being performed as part of oversight of Settling Defendant's  
12 implementation of the Work, unless a different time frame is agreed to by EPA or  
13 DTSC and Settling Defendant. Upon request, EPA and DTSC shall allow Settling  
14 Defendant to take split or duplicate samples of any samples they take as part of  
15 Plaintiffs' oversight of Settling Defendant's implementation of the Work.  
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19           21. Settling Defendant shall submit to EPA and DTSC one electronic  
20 copy and one hard copy of the results of all sampling and/or tests or other data  
21 obtained or generated by or on behalf of Settling Defendant with respect to  
22 Operable Unit 1 and/or the implementation of this Consent Decree unless EPA  
23 agrees otherwise.  
24  
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27           22. Notwithstanding any provision of this Consent Decree, the United  
28 States and the State retain all of their information gathering and inspection

1 authorities and rights, including enforcement actions related thereto, under  
2 CERCLA, RCRA, and any other applicable statutes or regulations.  
3

4 IX. ACCESS AND INSTITUTIONAL CONTROLS

5  
6 23. If the Site, or any other real property where access or land/water use  
7 restrictions are needed to implement the Work, is owned or controlled by Settling  
8 Defendant:

9  
10 a. Settling Defendant shall, commencing on the date of lodging of  
11 the Consent Decree, provide the United States, DTSC, and their representatives,  
12 contractors, and subcontractors, with access at all reasonable times to the Site, or  
13 such other real property, to conduct any activity regarding the Consent Decree  
14 including, but not limited to, the following activities:  
15  
16

17 (1) Monitoring the Work;

18  
19 (2) Verifying any data or information submitted to the  
20 United States or DTSC;

21  
22 (3) Conducting investigations regarding contamination at or  
23 near the Site;

24  
25 (4) Obtaining samples;  
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1 (5) Assessing the need for, planning, or implementing  
2 additional response actions at or near the Site;  
3

4 (6) Assessing implementation of quality assurance and  
5 quality control practices as defined in the approved CQAP;  
6

7 (7) Implementing the Work pursuant to the conditions set  
8 forth in Paragraph 88 (Work Takeover);  
9

10 (8) Inspecting and copying records, operating logs, contracts,  
11 or other documents maintained or generated by Settling Defendant or its  
12 agents, consistent with Section XXIV (Access to Information);  
13

14 (9) Assessing Settling Defendant's compliance with the  
15 Consent Decree;  
16

17 (10) Determining whether the Site or other real property is  
18 being used in a manner that is prohibited or restricted, or that may need to  
19 be prohibited or restricted under the Consent Decree; and  
20  
21

22 (11) Implementing, monitoring, maintaining, reporting on,  
23 and enforcing any Institutional Controls and the requirements of the ICIAP.  
24

25 24. If the Site, or any other real property where access and/or land/water  
26 use restrictions are needed to implement the Work is owned or controlled by  
27 persons other than Settling Defendant:  
28



1           a.       Settling Defendant shall use best efforts to secure from such  
2 persons:  
3

4                   (1)     an agreement to provide access thereto for the United  
5 States, DTSC, and Settling Defendant, and their representatives,  
6 contractors, and subcontractors, to conduct any activity regarding the  
7 Consent Decree including, but not limited to, the activities listed in  
8 Paragraph 23.a; and  
9  
10

11                   (2)     the execution and recordation in the appropriate land  
12 records office of Proprietary Controls, in substantially the form attached  
13 hereto as Appendix D, that (i) grant a right of access to conduct any activity  
14 regarding the Consent Decree including, but not limited to, those activities  
15 listed in Paragraph 23.a, and (ii) grant the right to enforce the land/water  
16 use restrictions set forth in Section 12 of the ROD, including Table 12-1,  
17 including, but not limited to, the specific restrictions listed therein and any  
18 land/water use restrictions listed in the ICIAP, after approval by EPA. The  
19 Proprietary Controls shall be granted to DTSC and its representatives. The  
20 Proprietary Controls shall include a designation that EPA is a third party  
21 beneficiary, and may include a designation that Settling Defendant is a third  
22 party beneficiary, allowing EPA and Settling Defendant to maintain the  
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1 right to enforce the Proprietary Controls without acquiring an interest in  
2 real property.  
3

4 b. Within 240 days after EPA's approval of the ICIAP, Settling  
5 Defendant shall submit to EPA for review and approval, and to DTSC for  
6 execution, regarding each such property: (i) Proprietary Controls executed by each  
7 property owner specified in the ICIAP; and (ii) a current title insurance  
8 commitment, title survey, or other evidence of title acceptable to EPA, that shows  
9 title to the land affected by the Proprietary Controls to be free and clear of prior  
10 liens and encumbrances pursuant to Section III.A.4.d. of the SOW (except when  
11 EPA, following reasonable opportunity for review and comment by DTSC, waives  
12 the release or subordination of such prior liens or encumbrances, including but not  
13 limited to when, despite best efforts, Settling Defendant is unable to obtain release  
14 or subordination of such prior liens or encumbrances).  
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20 c. Within 90 days of the later of (i) EPA's approval and  
21 acceptance of the title evidence, or (ii) DTSC's execution of the Proprietary  
22 Controls, Settling Defendant shall update the title search and, if it is determined  
23 that nothing has occurred since the effective date of the commitment, or other title  
24 evidence, to affect the title adversely, record or arrange for the property owner to  
25 record the Proprietary Controls with the appropriate land records office. Within 30  
26 days after the recording of the Proprietary Controls, Settling Defendant shall  
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1 provide EPA with a final title insurance policy, title survey, or other final evidence  
2 of title acceptable to EPA, and a certified copy of the original recorded Proprietary  
3 Controls showing the clerk's recording stamps.  
4

5           25. For purposes of Paragraphs 24.a and 24.b, "best efforts" means the  
6 efforts that a reasonable person in the position of Settling Defendant would use so  
7 as to achieve the goal in a timely manner, including the cost of employing  
8 professional assistance and the payment of reasonable sums of money to secure  
9 Proprietary Controls, agreements, releases, subordinations, modifications or  
10 relocation of liens or other prior encumbrances that affect the title, as applicable.  
11

12 If, within 120 days after EPA's approval of the ICIAP, Settling Defendant has not:  
13

14 (a) obtained agreements to provide access, or record Proprietary Controls, as  
15 required by Paragraph 24.a(1) or 24.a(2); or (b) obtained, pursuant to Paragraph  
16 24.b, agreements from the holders of prior liens or encumbrances to release or  
17 subordinate such liens or encumbrances to the Proprietary Controls pursuant to  
18 Section III.A.4.d. of the SOW, Settling Defendant shall promptly notify the United  
19 States and DTSC in writing, and shall include in that notification a summary of the  
20 steps that Settling Defendant has taken to attempt to comply with Paragraph 24.  
21

22 The United States may, as it deems appropriate, assist Settling Defendant in  
23 obtaining access, agreements to restrict land/water use, Proprietary Controls, or the  
24 release or subordination of a prior lien or encumbrance. Settling Defendant shall  
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1 reimburse the United States under Section XVI (Payments for Response Costs) for  
2 all costs incurred, direct or indirect, by the United States in obtaining such access,  
3  
4 agreements to restrict land/water use, Proprietary Controls, and/or the necessary  
5 release/subordination of prior liens or encumbrances including, but not limited to,  
6  
7 the cost of attorney time and the amount of monetary consideration paid or just  
8  
9 compensation for a property interest.

10         26. If EPA, following reasonable opportunity for review and comment by  
11 DTSC, determines that any other Institutional Controls, other than the General Plan  
12 footnote described in Section III.A.3 of the SOW, in the form of state or local laws,  
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14 regulations, ordinances, zoning restrictions, or other governmental controls are  
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16 needed at or in connection with the Site, Settling Defendant shall cooperate with  
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18 EPA's and DTSC's efforts to secure and ensure compliance with such  
19  
20 governmental controls.

21         27. Notwithstanding any provision of the Consent Decree, the United  
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23 States and the State retain all of their access authorities and rights, as well as all  
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25 their rights to require Institutional Controls, including enforcement authorities  
26  
27 related thereto, under CERCLA, RCRA, and any other applicable statute or  
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29 regulations.

1 X. REPORTING REQUIREMENTS

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3 28. In addition to any other requirement of this Consent Decree, Settling  
4 Defendant shall submit to EPA and DTSC one electronic copy each of written  
5 progress reports that: (a) are submitted monthly (or less frequently if agreed to by  
6 the Parties) while design or construction activities are occurring, and quarterly (or  
7 less frequently if agreed to by the Parties) during other periods of Work;  
8  
9 (b) describe the actions that have been taken toward achieving compliance with  
10 this Consent Decree during the previous reporting period; (c) identify all plans,  
11 reports, and other deliverables required by this Consent Decree completed and  
12 submitted during the previous reporting period; (d) describe all actions, including,  
13 but not limited to, data collection and implementation of work plans, that are  
14 scheduled for the next two reporting periods and provide other information relating  
15 to the progress of the Work, including, as appropriate, critical path diagrams such  
16 as Gantt charts and Pert charts (which shall only be required until construction is  
17 complete); (e) include information regarding percentage of completion, unresolved  
18 delays encountered or anticipated that may affect the future schedule for  
19 implementation of the Work, and a description of efforts made to mitigate those  
20 delays or anticipated delays; (f) include any modifications to the work plans or  
21 other schedules that Settling Defendant has proposed to EPA or that have been  
22 approved by EPA; and (g) describe all activities undertaken in support of the  
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1 Community Involvement Plan during the previous reporting period and those to be  
2 undertaken in the next two reporting periods. Settling Defendant shall submit  
3 these progress reports to EPA and DTSC by the tenth day of every reporting period  
4 following the lodging of this Consent Decree until EPA notifies Settling Defendant  
5 pursuant to Paragraph 48.b of Section XIV (Certification of Completion). If  
6 requested by EPA or DTSC, Settling Defendant shall also provide briefings for  
7 EPA and DTSC to discuss the progress of the Work.  
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11 29. Settling Defendant shall notify EPA and DTSC of any change in the  
12 schedule described in the progress report for the performance of any activity,  
13 including, but not limited to, data collection and implementation of work plans, no  
14 later than seven days prior to the performance of the activity.  
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17 30. Upon the occurrence of any event during performance of the Work  
18 that Settling Defendant is required to report pursuant to Section 103 of CERCLA,  
19 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community  
20 Right-to-Know Act (“EPCRA”), 42 U.S.C. § 11004, Settling Defendant shall,  
21 within 24 hours of the onset of such event, orally notify the EPA Project  
22 Coordinator or the Alternate EPA Project Coordinator (in the event of the  
23 unavailability of the EPA Project Coordinator), or, in the event that neither the  
24 EPA Project Coordinator nor Alternate EPA Project Coordinator is available, the  
25 Emergency Response Section, Region IX, United States Environmental Protection  
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1 Agency. These reporting requirements are in addition to the reporting required by  
2 CERCLA Section 103 or EPCRA Section 304. Immediately following notice to  
3  
4 EPA as required by this Paragraph, the Settling Defendant shall then orally notify  
5 the DTSC Project Manager.  
6

7 31. Within 30 days after the onset of such an event, Settling Defendant  
8 shall furnish to EPA and DTSC a written report, signed by Settling Defendant's  
9  
10 Project Coordinator, setting forth the events that occurred and the measures taken,  
11 and to be taken, in response thereto. Within 45 days after the conclusion of such  
12  
13 an event, Settling Defendant shall submit a report setting forth all actions taken in  
14 response thereto.  
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16 32. Settling Defendant shall submit one electronic copy and one hard  
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18 copy of all plans, reports, data, and other deliverables required by the SOW, the  
19  
20 Remedial Design Work Plan, the Remedial Action Work Plan, or any other  
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22 approved plans to EPA in accordance with the schedules set forth in such plans,  
23 unless EPA agrees otherwise. Settling Defendant shall simultaneously submit one  
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25 electronic copy and one hard copy of all such plans, reports, data, and other  
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27 deliverables to DTSC, unless DTSC agrees otherwise.  
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33. All deliverables submitted by Settling Defendant to EPA and DTSC  
that purport to document Settling Defendant's compliance with the terms of this

1 Consent Decree shall be signed by an authorized representative of Settling  
2 Defendant.  
3

4 XI. EPA APPROVAL OF PLANS, REPORTS, AND OTHER  
5 DELIVERABLES

6 34. Initial Submissions.

7 a. After review of any plan, report, or other deliverable that is  
8 required to be submitted for approval pursuant to this Consent Decree, EPA, after  
9 reasonable opportunity for review and comment by DTSC, shall: (1) approve, in  
10 whole or in part, the submission; (2) approve the submission upon specified  
11 conditions; (3) disapprove, in whole or in part, the submission; or (4) any  
12 combination of the foregoing.  
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16 b. EPA also may modify the initial submission to cure deficiencies  
17 in the submission if: (1) EPA determines that disapproving the submission and  
18 awaiting a resubmission would cause substantial disruption to the Work; or  
19 (2) previous submission(s) have been disapproved due to material defects and the  
20 deficiencies in the initial submission under consideration indicate a bad faith lack  
21 of effort to submit an acceptable plan, report, or deliverable.  
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25 35. Resubmissions. Upon receipt of a notice of disapproval under  
26 Paragraph 34.a(3) or (4), or if required by a notice of approval upon specified  
27 conditions under Paragraph 34.a(2), Settling Defendant shall, within 15 days or  
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1 such longer time as specified by EPA, after reasonable opportunity for review and  
2 comment by DTSC, in such notice, correct the deficiencies and resubmit the plan,  
3 report, or other deliverable for approval. After review of the resubmitted plan,  
4 report, or other deliverable, EPA may: (a) approve, in whole or in part, the  
5 resubmission; (b) approve the resubmission upon specified conditions; (c) modify  
6 the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring  
7 Settling Defendant to correct the deficiencies; or (e) any combination of the  
8 foregoing.

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13 36. Material Defects. If an initially submitted or resubmitted plan, report,  
14 or other deliverable contains a material defect, and the plan, report, or other  
15 deliverable is disapproved or modified by EPA under Paragraph 34.b(2) or 35 due  
16 to such material defect, then the material defect shall constitute a lack of  
17 compliance for purposes of Paragraph 71. The provisions of Section XIX (Dispute  
18 Resolution) and Section XX (Stipulated Penalties) shall govern the accrual and  
19 payment of any stipulated penalties regarding Settling Defendant's submissions  
20 under this Section.  
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24 37. Implementation. Upon approval, approval upon conditions, or  
25 modification by EPA under Paragraph 34 (Initial Submissions) or Paragraph 35  
26 (Resubmissions), of any plan, report, or other deliverable, or any portion thereof:  
27 (a) such plan, report, or other deliverable, or portion thereof, shall be incorporated  
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1 into and enforceable under this Consent Decree; and (b) Settling Defendant shall  
2 take any action required by such plan, report, or other deliverable, or portion  
3 thereof, subject only to its right to invoke the Dispute Resolution procedures set  
4 forth in Section XIX (Dispute Resolution) with respect to the modifications or  
5 conditions made by EPA. The implementation of any non-deficient portion of a  
6 plan, report, or other deliverable submitted or resubmitted under Paragraph 34 or  
7 35 shall not relieve Settling Defendant of any liability for stipulated penalties  
8 under Section XX (Stipulated Penalties).  
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## 12 XII. PROJECT COORDINATORS

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14 38. Within 20 days after lodging this Consent Decree, Settling Defendant,  
15 DTSC and EPA will notify each other, in writing, of the name, address, telephone  
16 number, and email address of their respective designated Project Coordinators and  
17 Alternate Project Coordinators. If a Project Coordinator or Alternate Project  
18 Coordinator initially designated is changed, the identity of the successor will be  
19 given to the other Parties at least five working days before the change occurs,  
20 unless impracticable, but in no event later than the actual day the change is made.  
21 Settling Defendant's Project Coordinator shall be subject to disapproval by EPA,  
22 after reasonable opportunity for review and comment by DTSC, and shall have the  
23 technical expertise sufficient to adequately oversee all aspects of the Work.  
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28 Settling Defendant's Project Coordinator shall not be an attorney for any Settling

1 Defendant in this matter. He or she may assign other representatives, including  
2 other contractors, to serve as a Site representative for oversight of performance of  
3 daily operations during remedial activities.  
4

5           39. Plaintiffs may designate other representatives, including, but not  
6 limited to, EPA and DTSC employees, and federal and State contractors and  
7 consultants, to observe and monitor the progress of any activity undertaken  
8 pursuant to this Consent Decree. EPA's Project Coordinator and Alternate Project  
9 Coordinator shall have the authority lawfully vested in a Remedial Project  
10 Manager ("RPM") and an On-Scene Coordinator ("OSC") by the NCP, 40 C.F.R.  
11 Part 300. EPA's Project Coordinator or Alternate Project Coordinator shall have  
12 authority, consistent with the NCP, to halt any Work required by this Consent  
13 Decree and to take any necessary response action when he or she determines that  
14 conditions at the Site constitute an emergency situation or may present an  
15 immediate threat to public health or welfare or the environment due to release or  
16 threatened release of Waste Material.  
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22           40. EPA's Project Coordinator, DTSC's Project Coordinator, and Settling  
23 Defendant's Project Coordinator will meet (in person, by teleconference, or  
24 electronically), at a minimum, on a quarterly basis.  
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XIII. PERFORMANCE GUARANTEE

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3 41. In order to ensure the full and final completion of the Work, Settling  
4 Defendant shall establish and maintain a performance guarantee, initially in the  
5 amount of \$53,893,000, for the benefit of EPA (hereinafter “Estimated Cost of the  
6 Work”). The performance guarantee, which must be satisfactory in form and  
7 substance to EPA, shall be in the form of one or more of the following mechanisms  
8 (provided that, if Settling Defendant intends to use multiple mechanisms, such  
9 multiple mechanisms shall be limited to surety bonds guaranteeing payment, letters  
10 of credit, trust funds, and insurance policies):  
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14 a. A surety bond unconditionally guaranteeing payment and/or  
15 performance of the Work that is issued by a surety company among those listed as  
16 acceptable sureties on federal bonds as set forth in Circular 570 of the U.S.  
17 Department of the Treasury;  
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19

20 b. One or more irrevocable letters of credit, payable to or at the  
21 direction of EPA, that is issued by one or more financial institution(s) (1) that has  
22 the authority to issue letters of credit and (2) whose letter-of-credit operations are  
23 regulated and examined by a federal or state agency;  
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1 c. A trust fund established for the benefit of EPA that is  
2 administered by a trustee (1) that has the authority to act as a trustee and (2) whose  
3 trust operations are regulated and examined by a federal or state agency;

4  
5 d. A policy of insurance that (1) provides EPA with acceptable  
6 rights as a beneficiary thereof; and (2) is issued by an insurance carrier (i) that has  
7 the authority to issue insurance policies in the applicable jurisdiction(s) and  
8 (ii) whose insurance operations are regulated and examined by a federal or state  
9 agency;

10  
11 e. A demonstration by Settling Defendant that Settling Defendant  
12 meets the financial test criteria of 40 C.F.R. § 264.143(f) with respect to the  
13 Estimated Cost of the Work (plus the amount(s) of any other federal or any state  
14 environmental obligations financially assured through the use of a financial test or  
15 guarantee), provided that all other requirements of 40 C.F.R. § 264.143(f) are met  
16 to EPA's satisfaction; or

17  
18 f. A written guarantee to fund or perform the Work executed in  
19 favor of EPA by one or more of the following: (1) a direct or indirect parent  
20 company of Settling Defendant, or (2) a company that has a "substantial business  
21 relationship" (as defined in 40 C.F.R. § 264.141(h)) with Settling Defendant;  
22 provided, however, that any company providing such a guarantee must  
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1 demonstrate to the satisfaction of EPA that it satisfies the financial test and  
2 reporting requirements for owners and operators set forth in subparagraphs (1)  
3 through (8) of 40 C.F.R. § 264.143(f) with respect to the Estimated Cost of the  
4 Work (plus the amount(s) of any other federal or any state environmental  
5 obligations financially assured through the use of a financial test or guarantee) that  
6 it proposes to guarantee hereunder.  
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9  
10 42. Settling Defendant has selected, and EPA has found satisfactory, as an  
11 initial performance guarantee pursuant to Paragraph 41.b, in the form attached  
12 hereto as Appendix E. Within 10 days after the Effective Date, Settling Defendant  
13 shall execute or otherwise finalize all instruments or other documents required in  
14 order to make the selected performance guarantee(s) legally binding in a form  
15 substantially identical to the documents attached hereto as Appendix E, and such  
16 performance guarantee(s) shall thereupon be fully effective. Within 30 days after  
17 the Effective Date, Settling Defendant shall submit copies of all executed and/or  
18 otherwise finalized instruments or other documents required in order to make the  
19 selected performance guarantee(s) legally binding to the EPA Regional Financial  
20 Management Officer in accordance with Section XXVI (Notices and Submissions),  
21 with a copy to Kathi Moore, Superfund Division, EPA Region IX, 75 Hawthorne  
22 St., San Francisco, CA 94105 and to the United States and EPA and DTSC as  
23 specified in Section XXVI.  
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1           43. If, at any time after the Effective Date and before issuance of the  
2 Certification of Completion of the Work pursuant to Paragraph 48, Settling  
3 Defendant provides a performance guarantee for completion of the Work by means  
4 of a demonstration or guarantee pursuant to Paragraph 41.e or 41.f, Settling  
5 Defendant shall also comply with the other relevant requirements of 40 C.F.R.  
6 § 264.143(f) relating to these mechanisms unless otherwise provided in this  
7 Consent Decree, including but not limited to: (a) the initial submission of required  
8 financial reports and statements from the relevant entity’s chief financial officer  
9 (“CFO”) and independent certified public accountant (“CPA”), in the form  
10 prescribed by EPA in its financial test sample CFO letters and CPA reports  
11 available at: [http://www2.epa.gov/sites/production/files/documents/fa-test-](http://www2.epa.gov/sites/production/files/documents/fa-test-samples-o.pdf)  
12 [samples-o.pdf](http://www2.epa.gov/sites/production/files/documents/fa-test-samples-o.pdf); (b) the annual resubmission of such reports and statements within  
13 90 days after the close of each such entity’s fiscal year; and (c) the prompt  
14 notification of EPA after each such entity determines that it no longer satisfies the  
15 financial test requirements set forth at 40 C.F.R. § 264.143(f)(1) and in any event  
16 within 90 days after the close of any fiscal year in which such entity no longer  
17 satisfies such financial test requirements. For purposes of the performance  
18 guarantee mechanisms specified in this Section XIII, references in 40 C.F.R.  
19 Part 264, Subpart H, to “closure,” “post-closure,” and “plugging and  
20 abandonment” shall be deemed to include the Work; the terms “current closure  
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1 cost estimate,” “current post-closure cost estimate,” and “current plugging and  
2 abandonment cost estimate” shall be deemed to include the Estimated Cost of the  
3 Work; the terms “owner” and “operator” shall be deemed to refer to Settling  
4 Defendant making a demonstration under Paragraph 41.e; and the terms “facility”  
5 and “hazardous waste facility” shall be deemed to include the Site.  
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8           44. In the event that EPA determines at any time that a performance  
9 guarantee provided by Settling Defendant pursuant to this Section is inadequate or  
10 otherwise no longer satisfies the requirements set forth in this Section, whether due  
11 to an increase in the estimated cost of completing the Work or for any other reason,  
12 or in the event that Settling Defendant becomes aware of information indicating  
13 that a performance guarantee provided pursuant to this Section is inadequate or  
14 otherwise no longer satisfies the requirements set forth in this Section, whether due  
15 to an increase in the estimated cost of completing the Work or for any other reason,  
16 Settling Defendant, within 30 days after receipt of notice of EPA’s determination  
17 or, as the case may be, within 30 days after Settling Defendant becoming aware of  
18 such information, shall obtain and present to EPA for approval a proposal for a  
19 revised or alternative form of performance guarantee listed in Paragraph 41 that  
20 satisfies all requirements set forth in this Section XIII; provided, however, that if  
21 Settling Defendant cannot obtain such revised or alternative form of performance  
22 guarantee within such 30-day period, and provided further that the Settling  
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1 Defendant shall have commenced to obtain such revised or alternative form of  
2 performance guarantee within such 30-day period, and thereafter diligently  
3 proceeds to obtain the same, EPA shall extend such period for such time as is  
4 reasonably necessary for the Settling Defendant in the exercise of due diligence to  
5 obtain such revised or alternative form of performance guarantee, such additional  
6 period not to exceed 30 days. In seeking approval for a revised or alternative form  
7 of performance guarantee, Settling Defendant shall follow the procedures set forth  
8 in Paragraph 46.b(2). Settling Defendant's inability to post a performance  
9 guarantee for completion of the Work shall in no way excuse performance of any  
10 other requirements of this Consent Decree, including, without limitation, the  
11 obligation of Settling Defendant to complete the Work in strict accordance with the  
12 terms of this Consent Decree.  
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18 45. Funding for Work Takeover. The commencement of any Work  
19 Takeover pursuant to Paragraph 88 shall trigger EPA's right to receive the benefit  
20 of any performance guarantee(s) provided pursuant to Paragraphs 41.a, 41.b, 41.c,  
21 41.d, or 41.f, and at such time EPA shall have immediate access to resources  
22 guaranteed under any such performance guarantee(s), whether in cash or in kind,  
23 as needed to continue and complete the Work assumed by EPA under the Work  
24 Takeover. Upon the commencement of any Work Takeover, if (a) for any reason  
25 EPA is unable to promptly secure the resources guaranteed under any such  
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1 performance guarantee(s), whether in cash or in kind, necessary to continue and  
2 complete the Work assumed by EPA under the Work Takeover, or (b) in the event  
3 that the performance guarantee involves a demonstration of satisfaction of the  
4 financial test criteria pursuant to Paragraph 41.e or Paragraph 41.f(2), Settling  
5 Defendant (or in the case of Paragraph 41.f(2), the guarantor) shall immediately  
6 upon written demand from EPA deposit into a special account within the EPA  
7 Hazardous Substance Superfund or such other account as EPA may specify, in  
8 immediately available funds and without setoff, counterclaim, or condition of any  
9 kind, a cash amount up to but not exceeding the estimated cost of completing the  
10 Work as of such date, as determined by EPA. In addition, if at any time EPA is  
11 notified by the issuer of a performance guarantee that such issuer intends to cancel  
12 the performance guarantee mechanism it has issued, then, unless Settling  
13 Defendant provides a substitute performance guarantee mechanism in accordance  
14 with this Section XIII no later than 30 days prior to the impending cancellation  
15 date, EPA shall be entitled (as of and after the date that is 30 days prior to the  
16 impending cancellation) to draw fully on the funds guaranteed under the then-  
17 existing performance guarantee for use consistent with this Section. All EPA  
18 Work Takeover costs not reimbursed under this Paragraph shall be reimbursed  
19 under Section XVI (Payments for Response Costs).  
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46. Modification of Amount and/or Form of Performance Guarantee.

a. Reduction of Amount of Performance Guarantee. If Settling

Defendant believes that the estimated cost of completing the Work has diminished below the amount set forth in Paragraph 41, Settling Defendant may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition EPA in writing to request a reduction in the amount of the performance guarantee provided pursuant to this Section so that the amount of the performance guarantee is equal to the estimated cost of completing the Work. Settling Defendant shall submit a written proposal for such reduction to EPA that shall specify, at a minimum, the estimated cost of completing the Work and the basis upon which such cost was calculated. In seeking approval for a reduction in the amount of the performance guarantee, Settling Defendant shall follow the procedures set forth in Paragraph 46.b(2) for requesting a revised or alternative form of performance guarantee, except as specifically provided in this Paragraph 46.a. If EPA decides to accept Settling Defendant's proposal for a reduction in the amount of the performance guarantee, either to the amount set forth in Settling Defendant's written proposal or to some other amount as selected by EPA, EPA will notify the petitioning Settling Defendant of such decision in writing. Upon EPA's acceptance of a reduction in the amount of the performance guarantee, the Estimated Cost of the Work shall be deemed to be the estimated cost

1 of completing the Work set forth in EPA's written decision. After receiving EPA's  
2 written decision, Settling Defendant may reduce the amount of the performance  
3 guarantee in accordance with and to the extent permitted by such written  
4 acceptance and shall submit copies of all executed and/or otherwise finalized  
5 instruments or other documents required in order to make the selected performance  
6 guarantee(s) legally binding in accordance with Paragraph 46.b(2). In the event of  
7 a dispute, Settling Defendant may reduce the amount of the performance guarantee  
8 required hereunder only in accordance with a final administrative or judicial  
9 decision resolving such dispute pursuant to Section XIX (Dispute Resolution). No  
10 change to the form or terms of any performance guarantee provided under this  
11 Section, other than a reduction in amount, is authorized except as provided in  
12 Paragraphs 44 or 46.a.  
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18 b. Change of Form of Performance Guarantee.

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20 (1) If, after the Effective Date, Settling Defendant desires to  
21 change the form or terms of any performance guarantee(s) provided pursuant  
22 to this Section, Settling Defendant may, on any anniversary of the Effective  
23 Date, or at any other time agreed to by the Parties, petition EPA in writing to  
24 request a change in the form or terms of the performance guarantee provided  
25 hereunder. The submission of such proposed revised or alternative  
26 performance guarantee shall be as provided in Paragraph 46.a(2). Any  
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decision made by EPA on a petition submitted under this Paragraph shall be made in EPA’s sole and unreviewable discretion, and such decision shall not be subject to challenge by Settling Defendant pursuant to the dispute resolution provisions of this Consent Decree or in any other forum.

(2) Settling Defendant shall submit a written proposal for a revised or alternative performance guarantee to EPA that shall specify, at a minimum, the estimated cost of completing the Work, the basis upon which such cost was calculated, and the proposed revised performance guarantee, including all proposed instruments or other documents required in order to make the proposed performance guarantee legally binding. The proposed revised or alternative performance guarantee must satisfy all requirements set forth or incorporated by reference in this Section. Settling Defendant shall submit such proposed revised or alternative performance guarantee to the EPA Regional Financial Management Officer in accordance with Section XXVI (Notices and Submissions), with a copy to Kathi Moore, Superfund Division, EPA Region IX, 75 Hawthorne St., San Francisco, CA 94105. EPA will notify Settling Defendant in writing of its decision to accept or reject a revised or alternative performance guarantee submitted pursuant to this Paragraph. Within ten days after receiving a written decision approving the proposed revised or alternative performance

1           guarantee, Settling Defendant shall execute and/or otherwise finalize all  
2           instruments or other documents required in order to make the selected  
3           performance guarantee(s) legally binding in a form substantially identical  
4           to the documents submitted to EPA as part of the proposal, and such  
5           performance guarantee(s) shall thereupon be fully effective. Settling  
6           Defendant shall submit copies of all executed and/or otherwise finalized  
7           instruments or other documents required in order to make the selected  
8           performance guarantee(s) legally binding to the EPA Regional Financial  
9           Management Officer within 30 days after receiving a written decision  
10          approving the proposed revised or alternative performance guarantee in  
11          accordance with Section XXVI (Notices and Submissions), with a copy to  
12          Yenhung Ho, Financial Analyst, EPA Region IX, 75 Hawthorne St., San  
13          Francisco, CA 94105 and to the United States and EPA and DTSC as  
14          specified in Section XXVI.

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21           c.       Release of Performance Guarantee. Settling Defendant  
22          shall not release, cancel, or discontinue any performance guarantee provided  
23          pursuant to this Section except as provided in this Paragraph. If Settling  
24          Defendant receives written notice from EPA in accordance with  
25          Paragraph 48 that the Work has been fully and finally completed in  
26          accordance with the terms of this Consent Decree, or if EPA otherwise so  
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28

1 notifies Settling Defendant in writing, Settling Defendant may thereafter  
2 release, cancel, or discontinue the performance guarantee(s) provided  
3 pursuant to this Section. In the event of a dispute, Settling Defendant may  
4 release, cancel, or discontinue the performance guarantee(s) required  
5 hereunder only in accordance with a final administrative or judicial decision  
6 resolving such dispute pursuant to Section XIX (Dispute Resolution).  
7  
8

9  
10 **XIV. CERTIFICATION OF COMPLETION**

11 **47. Completion of the Remedial Action.**

12  
13 a. Within 30 days after Settling Defendant concludes that  
14 construction is complete for a treatment area-specific component of the Remedial  
15 Action, Settling Defendant shall schedule and conduct a pre-certification  
16 inspection to be attended by Settling Defendant, EPA, and DTSC. Reporting and  
17 follow-ups to the inspection shall be conducted as specified in the SOW. For the  
18 purposes of this Section, a “treatment area-specific component of the Remedial  
19 Action” shall be defined as the application of a remedial technology within a  
20 contiguous area.  
21  
22

23  
24 b. Within 120 days after a treatment area-specific component of  
25 the Remedial Action has been fully performed and the applicable Performance  
26 Standards have been achieved, Settling Defendant shall submit a written Treatment  
27  
28

1 Area-Specific Remedial Action Report. In the report, a registered professional  
2 engineer and Settling Defendant's Project Coordinator shall state that the treatment  
3 area-specific component of the Remedial Action has been completed in full  
4 satisfaction of the requirements of this Consent Decree and Statement of Work.  
5 The written report shall include as-built drawings signed and stamped by a  
6 professional engineer for any Remedial Action-related structures that remain in  
7 place. The report shall contain the following statement, signed by a responsible  
8 corporate official of Settling Defendant or Settling Defendant's Project  
9 Coordinator:  
10  
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13

14 I certify under penalty of law that this document and all attachments were  
15 prepared under my direction or supervision in accordance with a system  
16 designed to assure that qualified personnel properly gather and evaluate the  
17 information submitted. Based on my inquiry of the person or persons who  
18 manage the system, or those persons directly responsible for gathering the  
19 information, the information submitted is, to the best of my knowledge and  
20 belief, true, accurate, and complete. I am aware that there are significant  
21 penalties for submitting false information, including the possibility of fine  
22 and imprisonment for knowing violations.  
23  
24  
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26

27 If, after review of any Treatment Area-Specific Remedial Action Report, EPA,  
28 after reasonable opportunity for review and comment by DTSC, determines that



1 the treatment area-specific component of the Remedial Action or any portion  
2 thereof has not been completed in accordance with this Consent Decree or that the  
3  
4 Performance Standards have not been achieved, EPA will notify Settling  
5 Defendant in writing of the activities that must be undertaken by Settling  
6 Defendant pursuant to this Consent Decree to complete the treatment area-specific  
7 component of the Remedial Action and achieve the relevant Performance  
8 Standards, provided, however, that EPA may only require Settling Defendant to  
9 perform such activities pursuant to this Paragraph to the extent that such activities  
10 are consistent with the “scope of the remedy set forth in the ROD,” as that term is  
11 defined in Paragraph 13.a. EPA will set forth in the notice a schedule for  
12 performance of such activities consistent with the Consent Decree and the SOW or  
13 require Settling Defendant to submit a schedule to EPA for approval pursuant to  
14 Section XI (EPA Approval of Plans, Reports, and Other Deliverables). Settling  
15 Defendant shall perform all activities described in the notice in accordance with  
16 the specifications and schedules established pursuant to this Paragraph, subject to  
17 its right to invoke the dispute resolution procedures set forth in Section XIX  
18 (Dispute Resolution).

19  
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24  
25 c. If EPA concludes, based on the initial or any subsequent report  
26 requesting Certification of Completion of any treatment area-specific component  
27 of the Remedial Action and after a reasonable opportunity for review and comment  
28

1 by DTSC, that said Remedial Action has been performed in accordance with this  
2 Consent Decree and that the Performance Standards have been achieved as to that  
3 treatment area, EPA will so certify in writing to Settling Defendant. This  
4 certification shall constitute the treatment area- specific Certification of  
5 Completion for that component of the Remedial Action for purposes of this  
6 Consent Decree. Certification of Completion of a treatment area-specific  
7 component of the Remedial Action shall not affect Settling Defendant's remaining  
8 obligations under this Consent Decree.

12 48. Completion of the Work.

13 a. Within 90 days after Settling Defendant concludes that all  
14 phases of the Work, other than any remaining activities required under Section VII  
15 (Remedy Review), have been fully performed, Settling Defendant shall submit a  
16 written report stating that the Work has been completed in full satisfaction of the  
17 requirements of this Consent Decree. The report shall contain the statement set  
18 forth in Paragraph 47.b, signed by a responsible corporate official of Settling  
19 Defendant or Settling Defendant's Project Coordinator. If, after review of the  
20 written report, EPA, after reasonable opportunity for review and comment by  
21 DTSC, determines that any portion of the Work has not been completed in  
22 accordance with this Consent Decree, EPA will notify Settling Defendant in  
23 writing of the activities that must be undertaken by Settling Defendant pursuant to  
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1 this Consent Decree to complete the Work, provided, however, that EPA may only  
2 require Settling Defendant to perform such activities pursuant to this Paragraph to  
3 the extent that such activities are consistent with the “scope of the remedy set forth  
4 in the ROD,” as that term is defined in Paragraph 13.a. EPA will set forth in the  
5 notice a schedule for performance of such activities consistent with the Consent  
6 Decree and the SOW or require Settling Defendant to submit a schedule to EPA  
7 for approval pursuant to Section XI (EPA Approval of Plans, Reports, and Other  
8 Deliverables). Settling Defendant shall perform all activities described in the  
9 notice in accordance with the specifications and schedules established therein,  
10 subject to its right to invoke the dispute resolution procedures set forth in Section  
11 XIX (Dispute Resolution).  
12  
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16  
17           b.       If EPA concludes, based on the initial or any subsequent  
18 request for Certification of Completion of the Work by Settling Defendant and  
19 after a reasonable opportunity for review and comment by DTSC, that the Work  
20 has been performed in accordance with this Consent Decree, EPA will so notify  
21 Settling Defendant in writing.  
22  
23

#### 24   XV. EMERGENCY RESPONSE

25  
26           49.     If any action or occurrence during the performance of the Work that  
27 causes or threatens a release of Waste Material from the Site that constitutes an  
28

1 emergency situation or may present an immediate threat to public health or welfare  
2 or the environment, Settling Defendant shall, subject to Paragraph 50, immediately  
3 take all appropriate action to prevent, abate, or minimize such release or threat of  
4 release, and shall immediately notify the EPA's Project Coordinator, or, if the  
5 Project Coordinator is unavailable, EPA's Alternate Project Coordinator. If neither  
6 of these persons is available, Settling Defendant shall notify the EPA Emergency  
7 Response Unit, Region IX. Settling Defendant shall take such actions in  
8 consultation with EPA's Project Coordinator or other available authorized EPA  
9 officer and in accordance with all applicable provisions of the Health and Safety  
10 Plans, the Contingency Plans, and any other applicable plans or documents  
11 developed pursuant to the SOW. In the event that Settling Defendant fails to take  
12 appropriate response action as required by this Section, and EPA or, as appropriate,  
13 DTSC takes such action instead, Settling Defendant shall reimburse EPA and  
14 DTSC for all costs of the response action under Section XVI (Payments for  
15 Response Costs).

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22         50. Subject to Section XXI (Covenants by Plaintiffs), nothing in the  
23 preceding Paragraph or in this Consent Decree shall be deemed to limit any  
24 authority of the United States, or the State, (a) to take all appropriate action to  
25 protect human health and the environment or to prevent, abate, respond to, or  
26 minimize an actual or threatened release of Waste Material on, at, or from the Site,  
27  
28

1 or (b) to direct or order such action, or seek an order from the Court, to protect  
2 human health and the environment or to prevent, abate, respond to, or minimize an  
3 actual or threatened release of Waste Material on, at, or from the Site.  
4

5  
6 XVI. PAYMENTS FOR RESPONSE COSTS

7 51. Payment by Settling Defendant for Past Response Costs and DTSC

8  
9 Past Response Costs.

10 a. Within 60 days after the Effective Date, Settling Defendant  
11 shall pay to EPA \$ 1,200,000 in payment for Past Response Costs. Payment shall  
12 be made in accordance with Paragraph 55.a (Instructions for Past Response Cost  
13 Payments).  
14

15  
16 b. The total amount to be paid by Settling Defendant pursuant to  
17 Paragraph 55.a shall be deposited by EPA in the Del Amo Superfund Site Special  
18 Account to be retained and used to conduct or finance response actions at or in  
19 connection with the Site, or to be transferred by EPA to the EPA Hazardous  
20 Substance Superfund.  
21

22  
23 c. Within 60 days after the Effective Date, Settling Defendant  
24 shall pay to DTSC \$ 63,993.81 by official bank check(s) made payable to  
25 California Department of Toxic Substances Control, in payment of DTSC Past  
26 Response Costs. Settling Defendant shall send the bank check(s) to Accounting,  
27  
28

1 California Department of Toxic Substances Control, 1001 "I" Street, 21<sup>st</sup> Floor,  
2 P.O. Box 806, Sacramento, CA 95812-0806.  
3

4 52. Payments by Settling Defendant for Future Response Costs and DTSC

5 Future Response Costs. Settling Defendant shall pay to EPA all Future Response  
6 Costs not inconsistent with the NCP.  
7

8 a. On a periodic basis, EPA will send Settling Defendant a bill  
9 requiring payment that includes a standard Regionally-prepared cost summary,  
10 which includes direct and indirect costs incurred by EPA and its contractors and a  
11 DOJ case cost summary. Settling Defendant shall make all payments within  
12 60 days after Settling Defendant's receipt of each bill requiring payment, except as  
13 otherwise provided in Paragraph 56, in accordance with Paragraph 55.b  
14 (Instructions for Future Response Cost Payments).  
15  
16  
17

18 b. The total amount to be paid by Settling Defendant pursuant to  
19 Paragraph 52.a shall be deposited by EPA in the Del Amo Superfund Site Special  
20 Account to be retained and used to conduct or finance response actions at or in  
21 connection with the Site, or to be transferred by EPA to the EPA Hazardous  
22 Substance Superfund.  
23  
24

25 c. Settling Defendant shall pay to DTSC all DTSC Future  
26 Response Costs not inconsistent with the NCP. DTSC will send Settling  
27  
28

1 Defendant a bill requiring payment that includes a Summary by Activity report on  
2 a quarterly basis. Settling Defendant shall have the right to review and request  
3 clarification of costs from DTSC to ensure that costs are appropriate, not  
4 inconsistent with the NCP, applied correctly to this Site and Operable Unit, and  
5 have not been included in past reimbursement requests. DTSC agrees to cooperate  
6 with reasonable requests and may for good cause extend the payment date to allow  
7 for completion of this activity. Settling Defendant shall not unreasonably delay  
8 reimbursement. Unless the payment date has been extended by DTSC pursuant to  
9 the foregoing, Settling Defendant shall make all payments within 60 days after  
10 Settling Defendant's receipt of each bill requiring payment, except as otherwise  
11 provided in Paragraph 56. Interest on these costs will accrue pursuant to California  
12 law. Settling Defendant shall make all payments to DTSC required by this  
13 Paragraph in accordance with Paragraph 51.c.

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20 53. Payments by Settling Federal Agency. The United States, on behalf  
21 of the Settling Federal Agency, shall reimburse Settling Defendant for a portion of  
22 EPA Past and Future Response Costs, DTSC Past and Future Response Costs, and  
23 Settling Defendant's Future Response Costs, pursuant to the 2014 Settlement  
24 Agreement. Any disputes regarding payments by Settling Federal Agency shall be  
25 addressed pursuant to the dispute resolution procedures set forth in that separate  
26 agreement.  
27  
28

1           54. The Parties to this Consent Decree recognize and acknowledge that  
2 the payment obligations of the Settling Federal Agency under this Consent Decree  
3 can only be paid from appropriated funds legally available for such purpose.  
4 Nothing in this Consent Decree shall be interpreted or construed as a commitment  
5 or requirement that Settling Federal Agency obligate or pay funds in contravention  
6 of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of  
7 law.  
8  
9  
10

11           55. Payment Instructions for Settling Defendant.

12  
13           a. Instructions for Past Response Costs Payments. All payments  
14 required elsewhere in this Consent Decree to be made in accordance with this  
15 Paragraph 55.a shall be made at <https://www.pay.gov> to the U.S. Department of  
16 Justice account, in accordance with instructions provided to Settling Defendant by  
17 the Financial Litigation Unit (“FLU”) of the United States Attorney’s Office for  
18 the Central District of California after the Effective Date. The payment  
19 instructions provided by the FLU shall include a Consolidated Debt Collection  
20 System (“CDCS”) number, which shall be used to identify all payments required to  
21 be made in accordance with this Consent Decree. The FLU shall provide the  
22 payment instructions to:  
23  
24  
25  
26

27           Carol Campagna  
28           Remedial Project Manager



1 Shell Oil Products US  
2 20945 S. Wilmington Ave.  
3 Carson, CA 90749  
4 Phone: 707-864-1617  
5 Fax: 713-423-0349  
6 Email: Carol.Campagna@Shell.com

7 on behalf of Settling Defendant. Settling Defendant may change the individual to  
8 receive payment instructions on its behalf by providing written notice of such  
9 change in accordance with Section XXVI (Notices and Submissions). When  
10 making payments under this Paragraph 55.a, Settling Defendant shall also comply  
11 with Paragraph 55.c.

12  
13 b. Instructions for Future Response Costs Payments and Stipulated  
14 Penalties. All payments required elsewhere in this Consent Decree to be made in  
15 accordance with this Paragraph 55.b shall be made by Fedwire EFT to:

16  
17  
18 Federal Reserve Bank of New York  
19 ABA = 021030004  
20 Account = 68010727  
21 SWIFT address = FRNYUS33  
22 33 Liberty Street  
23 New York NY 10045  
24 Field Tag 4200 of the Fedwire message should read “D 68010727  
25 Environmental Protection Agency”

26 When making payments under this Paragraph 55.b, Settling Defendant shall also  
27 comply with Paragraph 55.c.

28 c. Instructions for All Payments. All payments made under  
Paragraphs 55.a (Instructions for Past Response Cost Payments) or 55.b

1 (Instructions for Future Response Cost Payments) shall reference the CDCS  
2 Number, Site/Spill ID Number 09 36, and DOJ Case Number 90-11-2-933/4. At  
3 the time of any payment required to be made in accordance with Paragraphs 55.a  
4 or 55.b, Settling Defendant shall send notice that payment has been made to the  
5 United States, and to EPA, in accordance with Section XXVI (Notices and  
6 Submissions), and to the EPA Cincinnati Finance Office by email at  
7 acctsreceivable.cinwd@epa.gov, or by mail at 26 Martin Luther King Drive,  
8 Cincinnati, Ohio 45268. Such notice shall also reference the CDCS Number,  
9 Site/Spill ID Number, and DOJ Case Number.  
10  
11  
12  
13

14 56. Settling Defendant may contest any Future Response Costs or DTSC  
15 Future Response Costs billed under Paragraph 52 (Payments by Settling Defendant  
16 for Future Response Costs and DTSC Future Response Costs) if it determines that  
17 EPA or DTSC has made a mathematical error or included a cost item that is not  
18 within the definition of Future Response Costs or DTSC Future Response Costs, or  
19 if it believes EPA or DTSC incurred excess costs as a direct result of an action that  
20 was inconsistent with a specific provision or provisions of the NCP. Such  
21 objection shall be made in writing within 60 days after receipt of the bill and must  
22 be sent to the United States pursuant to Section XXVI (Notices and Submissions).  
23 Any such objection shall specifically identify the contested costs and the basis for  
24 objection. As to DTSC Future Response Costs, Settling Defendant must comply  
25  
26  
27  
28

1 with dispute resolution procedures in Paragraph 69.b (contesting payment of any  
2 DTSC Future Response Costs). In the event of an objection, Settling Defendant  
3 shall pay all uncontested costs to the United States or DTSC, as applicable, within  
4 60 days after Settling Defendant's receipt of the bill requiring payment.  
5

6 Simultaneously Settling Defendant shall establish, in a duly chartered bank or trust  
7 company, an interest-bearing escrow account that is insured by the Federal Deposit  
8 Insurance Corporation ("FDIC"), and by the due date for reimbursement of those  
9 costs remit to that escrow account funds equivalent to the amount of the contested  
10 costs. Deposit of the contested amount to the escrow account by the due date for  
11 reimbursement of costs shall constitute timely payment of the disputed costs.  
12  
13

14 Settling Defendant shall send to the United States, and DTSC as appropriate, as  
15 provided in Section XXVI (Notices and Submissions), a copy of the transmittal  
16 letter and check paying the uncontested costs, and a copy of the correspondence  
17 that establishes and funds the escrow account, including, but not limited to,  
18 information containing the identity of the bank and bank account under which the  
19 escrow account is established as well as a bank statement showing the initial  
20 balance of the escrow account. Simultaneously with establishment of the escrow  
21 account, Settling Defendant shall initiate the Dispute Resolution procedures in  
22 Section XIX (Dispute Resolution). If the United States prevails in the dispute,  
23  
24  
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27  
28 Settling Defendant shall pay the sums due (with any interest that has accrued in the

1 escrow account, or if the interest earned is less than the Surplus Money Investment  
2 Fund Rate, Settling Defendant will be required to pay additional interest as  
3  
4 necessary to make DTSC whole consistent with California Health and Safety Code  
5 Section 25360.1) to the United States and DTSC within five days after the  
6  
7 resolution of the dispute. If Settling Defendant prevails concerning any aspect of  
8  
9 the contested costs, Settling Defendant shall pay that portion of the costs (plus any  
10  
11 interest on that portion that has accrued in the escrow account) for which it did not  
12  
13 prevail to the United States/DTSC within five days after the resolution of the  
14  
15 dispute. Settling Defendant shall be disbursed any balance of the escrow account.

14 All payments to the United States under this Paragraph shall be made in  
15  
16 accordance with Paragraph 55.b (Instructions for Future Response Cost Payments).

17 The dispute resolution procedures set forth in this Paragraph in conjunction with  
18  
19 the procedures set forth in Section XIX (Dispute Resolution) shall be the exclusive  
20  
21 mechanisms for resolving disputes regarding Settling Defendant's obligation to  
22  
23 reimburse the United States for the Future Response Costs.

22       57. Interest. In the event that any payment for Past Response Costs or  
23  
24 DTSC Past Response Costs or for Future Response Costs or DTSC Future  
25  
26 Response Costs required under this Section is not made by the date required,  
27  
28 Settling Defendant shall pay Interest on the unpaid balance. The Interest to be paid  
on Past Response Costs and DTSC Past Response Costs under this Paragraph shall

1 begin to accrue on the Effective Date. The Interest on Future Response Costs and  
2 DTSC Future Response Costs shall begin to accrue on the date of the bill. The  
3  
4 Interest shall accrue through the date of Settling Defendant's payment. Payments  
5 of Interest made under this Paragraph shall be in addition to such other remedies or  
6  
7 sanctions available to Plaintiffs by virtue of Settling Defendant's failure to make  
8  
9 timely payments under this Section including, but not limited to, payment of  
10 stipulated penalties pursuant to Paragraph 72.

## 11 XVII. INDEMNIFICATION AND INSURANCE

12  
13 58. Settling Defendant's Indemnification of the United States and the  
14 State.

15  
16 a. The United States and the State do not assume any liability by  
17 entering into this Consent Decree or by virtue of any designation of Settling  
18 Defendant as EPA's authorized representative under Section 104(e) of CERCLA,  
19 42 U.S.C. § 9604(e). Settling Defendant shall indemnify, save and hold harmless  
20  
21 the United States, the State, and their officials, agents, employees, contractors,  
22  
23 subcontractors, and representatives for or from any and all claims or causes of  
24  
25 action arising from, or on account of, negligent or other wrongful acts or omissions  
26 of Settling Defendant, its officers, directors, employees, agents, contractors,  
27 subcontractors, and any persons acting on its behalf or under its control, in carrying  
28

1 out activities pursuant to this Consent Decree, including, but not limited to, any  
2 claims arising from any designation of Settling Defendant as EPA's authorized  
3 representative under Section 104(e) of CERCLA. Further, Settling Defendant  
4 agrees to pay the United States and the State all costs they incur including, but not  
5 limited to, attorneys' fees and other expenses of litigation and settlement arising  
6 from, or on account of, claims made against the United States or the State based on  
7 negligent or other wrongful acts or omissions of Settling Defendant, its officers,  
8 directors, employees, agents, contractors, subcontractors, and any persons acting  
9 on its behalf or under its control, in carrying out activities pursuant to this Consent  
10 Decree. Neither the United States nor the State shall be held out as a party to any  
11 contract entered into by or on behalf of Settling Defendant in carrying out activities  
12 pursuant to this Consent Decree. Neither Settling Defendant nor any such  
13 contractor shall be considered an agent of the United States or the State.  
14  
15  
16  
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19

20 b. The United States and the State shall give Settling Defendant  
21 notice of any claim for which the United States or the State plans to seek  
22 indemnification pursuant to this Paragraph 58, and shall consult with Settling  
23 Defendant prior to settling such claim.  
24

25 59. Unless otherwise provided in this Consent Decree, Settling Defendant  
26 covenants not to sue and agrees not to assert any claims or causes of action against  
27 the United States and the State for damages or reimbursement or for set-off of any  
28

1 payments made or to be made to the United States or the State, arising from or on  
2 account of any contract, agreement, or arrangement between Settling Defendant  
3 and any person for performance of Work on or relating to Operable Unit 1,  
4 including, but not limited to, claims on account of construction delays. In addition,  
5 Settling Defendant shall indemnify and hold harmless the United States and the  
6 State with respect to any and all claims for damages or reimbursement arising from  
7 or on account of any contract, agreement, or arrangement between Settling  
8 Defendant and any person for performance of Work on or relating to Operable Unit  
9 1, including, but not limited to, claims on account of construction delays.  
10  
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14 60. No later than 15 days before commencing any on-site Work, Settling  
15 Defendant shall secure, and shall maintain until the first anniversary after issuance  
16 of EPA's Certification of Completion for the last Treatment Area-Specific  
17 Remedial Action pursuant to Paragraph 47.c of Section XIV (Certification of  
18 Completion), commercial general liability insurance with limits of two million  
19 dollars, for any one occurrence, and automobile liability insurance with limits of  
20 one million dollars, combined single limit, naming the United States and DTSC as  
21 additional insureds with respect to all liability arising out of the activities  
22 performed by or on behalf of Settling Defendant pursuant to this Consent Decree.  
23  
24 In addition, for the duration of this Consent Decree, Settling Defendant shall  
25 satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable  
26  
27  
28

1 laws and regulations regarding the provision of worker’s compensation insurance  
2 for all persons performing the Work on behalf of Settling Defendant in furtherance  
3 of this Consent Decree. Prior to commencement of the Work under this Consent  
4 Decree, Settling Defendant shall provide to EPA and DTSC certificates of such  
5 insurance and a copy of each insurance policy. Settling Defendant shall resubmit  
6 such certificates and copies of policies each year on the anniversary of the  
7 Effective Date. If Settling Defendant demonstrates by evidence satisfactory to  
8 EPA and DTSC that any contractor or subcontractor maintains insurance  
9 equivalent to that described above, or insurance covering the same risks but in a  
10 lesser amount, then, with respect to that contractor or subcontractor, Settling  
11 Defendant need provide only that portion of the insurance described above that is  
12 not maintained by the contractor or subcontractor.  
13  
14  
15  
16  
17

#### 18 XVIII. FORCE MAJEURE

19  
20 61. “Force majeure,” for purposes of this Consent Decree, is defined as  
21 any event arising from causes beyond the control of Settling Defendant, of any  
22 entity controlled by Settling Defendant, or of Settling Defendant’s contractors that  
23 delays or prevents the performance of any obligation under this Consent Decree  
24 despite Settling Defendant’s best efforts to fulfill the obligation. The requirement  
25 that Settling Defendant exercise “best efforts to fulfill the obligation” includes  
26 using best efforts to anticipate any potential force majeure and best efforts to  
27  
28



1 address the effects of any potential force majeure (a) as it is occurring and  
2 (b) following the potential force majeure such that the delay and any adverse  
3 effects of the delay are minimized to the greatest extent possible. “Force majeure”  
4 does not include financial inability to complete the Work or a failure to achieve the  
5 Performance Standards.  
6  
7

8           62. If any event occurs or has occurred that may delay the performance of  
9 any obligation under this Consent Decree for which Settling Defendant intends or  
10 may intend to assert a claim of force majeure, Settling Defendant shall notify  
11 EPA’s Project Coordinator orally or, in his or her absence, EPA’s Alternate Project  
12 Coordinator or, in the event both of EPA’s designated representatives are  
13 unavailable, the Director of the Superfund Division, EPA Region IX, within five  
14 days of when Settling Defendant first knew that the event might cause a delay.  
15 Within 14 days thereafter, Settling Defendant shall provide in writing to EPA and  
16 DTSC an explanation and description of the reasons for the delay; the anticipated  
17 duration of the delay; all actions taken or to be taken to prevent or minimize the  
18 delay; a schedule for implementation of any measures to be taken to prevent or  
19 mitigate the delay or the effect of the delay; Settling Defendant’s rationale for  
20 attributing such delay to a force majeure; and a statement as to whether, in the  
21 opinion of Settling Defendant, such event may cause or contribute to an  
22 endangerment to public health or welfare, or the environment. Settling Defendant  
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1 shall include with any notice all available documentation supporting its claim that  
2 the delay was attributable to a force majeure. Settling Defendant shall be deemed  
3 to know of any circumstance of which Settling Defendant, any entity controlled by  
4 Settling Defendant, or Settling Defendant's contractors knew or should have  
5 known. Failure to comply with the above requirements regarding an event shall  
6 preclude Settling Defendant from asserting any claim of force majeure regarding  
7 that event, provided, however, that if EPA, despite the late notice, is able to assess  
8 to its satisfaction whether the event is a force majeure under Paragraph 61 and  
9 whether Settling Defendant has exercised its best efforts under Paragraph 61, EPA  
10 may, in its unreviewable discretion, excuse in writing Settling Defendant's failure  
11 to submit timely notices to EPA under this Paragraph.  
12  
13  
14  
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16

17 63. If EPA, after a reasonable opportunity for review and comment by  
18 DTSC, agrees that the delay or anticipated delay is attributable to a force majeure,  
19 the time for performance of the obligations under this Consent Decree that are  
20 affected by the force majeure will be extended by EPA, after a reasonable  
21 opportunity for review and comment by DTSC, for such time as is necessary to  
22 complete those obligations. An extension of the time for performance of the  
23 obligations affected by the force majeure shall not, of itself, extend the time for  
24 performance of any other obligation. If EPA, after a reasonable opportunity for  
25 review and comment by DTSC, does not agree that the delay or anticipated delay  
26  
27  
28



1 resolve disputes regarding this Consent Decree. However, the procedures set forth  
2 in this Section shall not apply to actions by the United States or DTSC to enforce  
3 obligations of Settling Defendant that have not been disputed in accordance with  
4 this Section.  
5

6  
7 66. Any dispute regarding this Consent Decree shall in the first instance  
8 be the subject of informal negotiations between the parties to the dispute. The  
9 period for informal negotiations shall not exceed 20 days from the time the dispute  
10 arises, unless it is modified by written agreement of the parties to the dispute. The  
11 dispute shall be considered to have arisen when one party sends the other parties a  
12 written Notice of Dispute.  
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15  
16 67. Statements of Position.

17 a. In the event that the parties cannot resolve a dispute by informal  
18 negotiations under the preceding Paragraph, then the position advanced by EPA  
19 shall be considered binding unless, within 14 days after the conclusion of the  
20 informal negotiation period, Settling Defendant invokes the formal dispute  
21 resolution procedures of this Section by serving on the United States and DTSC a  
22 written Statement of Position on the matter in dispute, including, but not limited to,  
23 any factual data, analysis, or opinion supporting that position and any supporting  
24 documentation relied upon by Settling Defendant. The Statement of Position shall  
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1 specify Settling Defendant's position as to whether formal dispute resolution  
2 should proceed under Paragraph 68 (Record Review) or 69.  
3

4           b.       Within 30 days after receipt of Settling Defendant's Statement  
5 of Position, EPA will serve on Settling Defendant its Statement of Position,  
6 including, but not limited to, any factual data, analysis, or opinion supporting that  
7 position and all supporting documentation relied upon by EPA. EPA's Statement  
8 of Position shall include a statement as to whether formal dispute resolution should  
9 proceed under Paragraph 68 (Record Review) or Paragraph 69. Within 30 days  
10 after receipt of EPA's Statement of Position, Settling Defendant may submit a  
11 Reply. In the event of a dispute between EPA and the Settling Defendant, DTSC  
12 shall have the option to submit a Statement of Position, and DTSC's Statement of  
13 Position shall be part of the administrative record.  
14  
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18           c.       If there is disagreement between EPA and Settling Defendant as  
19 to whether dispute resolution should proceed under Paragraph 68 (Record Review)  
20 or 69, the parties to the dispute shall follow the procedures set forth in the  
21 paragraph determined by EPA to be applicable. However, if Settling Defendant  
22 ultimately appeals to the Court to resolve the dispute, the Court shall determine  
23 which paragraph is applicable in accordance with the standards of applicability set  
24 forth in Paragraphs 68 and 69.  
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1           68. Record Review. Formal dispute resolution for disputes pertaining to  
2 the selection or adequacy of any response action and all other disputes that are  
3  
4 accorded review on the administrative record under applicable principles of  
5 administrative law shall be conducted pursuant to the procedures set forth in this  
6 Paragraph. For purposes of this Paragraph, the adequacy of any response action  
7 includes, without limitation, the adequacy or appropriateness of plans, procedures  
8 to implement plans, or any other items requiring approval by EPA under this  
9 Consent Decree, and the adequacy of the performance of response actions taken  
10 pursuant to this Consent Decree. Nothing in this Consent Decree shall be  
11 construed to allow any dispute by Settling Defendant regarding the validity of the  
12 ROD's provisions.  
13

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

23  
24           b. The Director of the Superfund Division, EPA Region IX, will  
25 issue a final administrative decision resolving the dispute based on the  
26 administrative record described in Paragraph 68.a. This decision shall be binding  
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1 upon Settling Defendant, subject only to the right to seek judicial review pursuant  
2 to Paragraphs 68.c and 68.d.  
3

4 c. Any administrative decision made by EPA pursuant to  
5 Paragraph 68.b shall be reviewable by this Court, provided that a motion for  
6 judicial review of the decision is filed by Settling Defendant with the Court and  
7 served on all Parties within ten days after receipt of EPA's decision. The motion  
8 shall include a description of the matter in dispute, the efforts made by the parties  
9 to resolve it, the relief requested, and the schedule, if any, within which the dispute  
10 must be resolved to ensure orderly implementation of this Consent Decree. The  
11 United States may file a response to Settling Defendant's motion.  
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15 d. In proceedings on any dispute governed by this Paragraph,  
16 Settling Defendant shall have the burden of demonstrating that the decision of the  
17 Superfund Division Director is arbitrary and capricious or otherwise not in  
18 accordance with law. Judicial review of EPA's decision shall be on the  
19 administrative record compiled pursuant to Paragraph 68.a.  
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23 69. Formal dispute resolution for disputes that neither pertain to the  
24 selection or adequacy of any response action nor are otherwise accorded review on  
25 the administrative record under applicable principles of administrative law, shall be  
26 governed by this Paragraph.  
27  
28

1           a.       Following receipt of Settling Defendant’s Statement of Position  
2 submitted pursuant to Paragraph 67, the Director of the Superfund Division, EPA  
3 Region IX, will issue a final decision resolving the dispute. The Superfund  
4 Division Director’s decision shall be binding on Settling Defendant unless, within  
5 ten days after receipt of the decision, Settling Defendant files with the Court and  
6 serves on the parties a motion for judicial review of the decision setting forth the  
7 matter in dispute, the efforts made by the parties to resolve it, the relief requested,  
8 and the schedule, if any, within which the dispute must be resolved to ensure  
9 orderly implementation of the Consent Decree. The United States may file a  
10 response to Settling Defendant’s motion.  
11

12           b.       If Settling Defendant contests payment of any DTSC Future  
13 Response Costs, Settling Defendant shall comply with the procedures set forth in  
14 this Subparagraph. Prior to requesting formal dispute resolution pursuant to this  
15 Subparagraph, Settling Defendant shall notify DTSC’s assigned Project Manager  
16 and attempt to informally resolve this dispute with DTSC’s Project Manager and  
17 branch chief.  
18

19                   (1)   If the dispute cannot be resolved informally within  
20 twenty (20) days, then Settling Defendant shall provide a written request  
21 for formal dispute resolution which shall describe all issues in dispute and  
22 shall set forth the reasons for the dispute, both factual and legal. The  
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1 written request for formal dispute resolution and any supporting  
2 documentation shall be sent to:

3  
4  
5 Special Assistant for Cost Recovery and Reimbursement Policy  
6 Department of Toxic Substances Control  
7 P. O. Box 806  
8 Sacramento, California 95812-0806

9 Copies of the written request for formal dispute resolution and any  
10 supporting documentation shall also be sent to those persons designated by  
11 DTSC to receive notices and submissions in Section XXVI of this Consent  
12 Decree. A decision on the billing dispute will be rendered by the Special  
13 Assistant for Cost Recovery and Reimbursement Policy or other DTSC  
14 designee applying the terms of this Consent Decree and applicable federal  
15 and state law.  
16  
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18

19 (2) The decision by the Special Assistant for Cost Recovery  
20 and Reimbursement Policy or designee shall be binding on Settling  
21 Defendant unless, within thirty (30) days of the receipt of the decision,  
22 Settling Defendant files with the Court and serves on DTSC a motion for  
23 judicial review of the decision setting forth the matter in dispute, the efforts  
24 made by the Parties to resolve it, the relief requested, and the schedule, if  
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1 any, within which the dispute must be resolved to ensure orderly  
2 implementation of the Consent Decree.  
3

4 c. Notwithstanding Paragraph M (CERCLA Section 113(j)  
5 Record Review of ROD and Work) of Section I (Background), judicial review of  
6 any dispute governed by this Paragraph shall be governed by applicable principles  
7 of law.  
8

9  
10 70. The invocation of formal dispute resolution procedures under this  
11 Section shall not extend, postpone, or affect in any way any obligation of Settling  
12 Defendant under this Consent Decree, not directly in dispute, unless EPA or the  
13 Court agrees otherwise. Stipulated penalties with respect to the disputed matter  
14 shall continue to accrue but payment shall be stayed pending resolution of the  
15 dispute as provided in Paragraph 78. Notwithstanding the stay of payment,  
16 stipulated penalties shall accrue from the first day of noncompliance with any  
17 applicable provision of this Consent Decree. In the event that Settling Defendant  
18 does not prevail on the disputed issue, stipulated penalties shall be assessed and  
19 paid as provided in Section XX (Stipulated Penalties).  
20  
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23

24 **XX. STIPULATED PENALTIES**  
25

26 71. Settling Defendant shall be liable for stipulated penalties in the  
27 amounts set forth in Paragraphs 72 and 73 to the United States and DTSC  
28

1 (penalties to be split between the Plaintiffs with 80% of penalties to be paid to the  
 2 United States and 20% of penalties to be paid to DTSC) for failure to comply with  
 3 the requirements of this Consent Decree specified below, unless excused under  
 4 Section XVIII (Force Majeure). “Compliance” by Settling Defendant shall include  
 5 completion of all payments and activities required under this Consent Decree, or  
 6 any plan, report, or other deliverable approved under this Consent Decree, in  
 7 accordance with all applicable requirements of law, this Consent Decree, the SOW,  
 8 and any plans, reports, or other deliverables approved under this Consent Decree  
 9 and within the specified time schedules established by and approved under this  
 10 Consent Decree.  
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15           72.   Stipulated Penalty Amounts - Work (Including Payments and  
 16 Excluding Plans, Reports, and Other Deliverables).  
 17

18           a.       The following stipulated penalties shall accrue per violation per  
 19 day for any noncompliance identified in Paragraph 72.b:

21 Penalty Per Violation Per Day	22 Period of Noncompliance
23           \$ 800	24 1st through 14th day
25           \$ 2,500	26 15th through 30th day
27           \$ 4,000	28 31st day and beyond

29           b.       Compliance Milestones.

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(1) Payment for Past Response Costs or DTSC Past Response Costs;

(2) Payments for Future Response Costs or DTSC Future Response Costs;

(3) Initiation of Implementation of Remedial Action pursuant to Paragraph 11.c;

(4) Failure to make best efforts to secure an access agreement pursuant to Paragraph 24.a(1);

(5) Failure to make best efforts to secure execution and recordation of any Proprietary Controls pursuant to Paragraph 24.a(2);

(6) Failure to make best efforts to secure subordination of any prior liens or encumbrances as required by Paragraph 24.b;

(7) Failure to comply with Section III.A.3. of the SOW regarding implementation of a General Plan footnote; and

(8) Failure to establish or maintain the performance guarantee required by Paragraph 41.

73. Stipulated Penalty Amounts - Plans, Reports, and Other Deliverables.

The following stipulated penalties shall accrue per violation per day for failure to

1 submit timely or adequate reports or other plans or deliverables required pursuant  
2 to the Consent Decree and/or SOW:  
3

4 Penalty Per Violation Per Day	Period of Noncompliance
5 \$ 400	1st through 14th day
6 \$ 700	15th through 30th day
7 \$ 1,500	31st day and beyond

8  
9  
10 74. In the event that EPA assumes performance of a portion or all of the  
11 Work pursuant to Paragraph 88 (Work Takeover), Settling Defendant shall be  
12 liable for a stipulated penalty in the amount of \$5,500,000. Stipulated penalties  
13 under this Paragraph are in addition to the remedies available under Paragraphs 45  
14 (Funding for Work Takeover) and 88 (Work Takeover).  
15  
16

17 75. All penalties shall begin to accrue on the day after the complete  
18 performance is due or the day a violation occurs and shall continue to accrue  
19 through the final day of the correction of the noncompliance or completion of the  
20 activity. However, stipulated penalties shall not accrue: (a) with respect to a  
21 deficient submission under Section XI (EPA Approval of Plans, Reports, and Other  
22 Deliverables), during the period, if any, beginning on the 31st day after EPA's  
23 receipt of such submission until the date that EPA notifies Settling Defendant of  
24 any deficiency; (b) with respect to a decision by the Director of the Superfund  
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1 Division, EPA Region IX, under Paragraph 68.b or 69.a of Section XIX (Dispute  
2 Resolution), during the period, if any, beginning on the 21st day after the date that  
3 Settling Defendant's reply to EPA's Statement of Position is received until the date  
4 that the Director issues a final decision regarding such dispute; or (c) with respect  
5 to judicial review by this Court of any dispute under Section XIX (Dispute  
6 Resolution), during the period, if any, beginning on the 31st day after the Court's  
7 receipt of the final submission regarding the dispute until the date that the Court  
8 issues a final decision regarding such dispute. Nothing in this Consent Decree  
9 shall prevent the simultaneous accrual of separate penalties for separate violations  
10 of this Consent Decree.  
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15           76. Following EPA's determination that Settling Defendant has failed to  
16 comply with a requirement of this Consent Decree, or DTSC's determination that  
17 Settling Defendant has failed to comply with Paragraph 51.c or Paragraph 52.c,  
18 EPA or DTSC, as appropriate, may give Settling Defendant written notification of  
19 the same and describe the noncompliance. EPA or DTSC may send Settling  
20 Defendant a written demand for the payment of any associated stipulated penalties.  
21 However, penalties shall accrue as provided in the preceding Paragraph regardless  
22 of whether EPA or DTSC has notified Settling Defendant of a violation.  
23  
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27           77. All penalties accruing under this Section shall be due and payable to  
28 the United States and DTSC within 60 days after Settling Defendant's receipt from

1 EPA of a demand for payment of the penalties, unless Settling Defendant invokes  
2 the Dispute Resolution procedures under Section XIX (Dispute Resolution) within  
3 the 60 day period. All payments to the United States under this Section shall  
4 indicate that the payment is for stipulated penalties and shall be made in  
5 accordance with Paragraph 55.b (Instructions for Future Response Cost Payments).  
6  
7

8 All payments to DTSC under this Section shall be made in accordance with  
9 Paragraph 52.c.  
10

11 78. Penalties shall continue to accrue as provided in Paragraph 75 during  
12 any dispute resolution period, but need not be paid until the following:  
13

14 a. If the dispute is resolved by agreement of the Parties or by a  
15 decision of EPA (or DTSC under Paragraph 69.b) that is not appealed to this  
16 Court, accrued penalties determined to be owed shall be paid to EPA and DTSC  
17 within 30 days after the agreement or the receipt of EPA's (or DTSC's) decision or  
18 order;  
19  
20

21 b. If the dispute is appealed to this Court and the United States  
22 and/or DTSC prevails in whole or in part, Settling Defendant shall pay all accrued  
23 penalties determined by the Court to be owed to EPA and DTSC within 60 days  
24 after receipt of the Court's decision or order, except as provided in Paragraph 78.c;  
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c. If the District Court’s decision is appealed by any Party, Settling Defendant shall pay all accrued penalties determined by the District Court to be owed to the United States and DTSC into an interest-bearing escrow account, established at a duly chartered bank or trust company that is insured by the FDIC, within 60 days after receipt of the Court’s decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days after receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA and DTSC or to Settling Defendant to the extent that they prevail.

79. If Settling Defendant fails to pay stipulated penalties when due, Settling Defendant shall pay Interest on the unpaid stipulated penalties as follows: (a) if Settling Defendant has timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to Paragraph 78 until the date of payment; and (b) if Settling Defendant fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 77 until the date of payment. If Settling Defendant fails to pay stipulated penalties and Interest when due, the United States or DTSC may institute proceedings to collect the penalties and Interest.





1 in Paragraph 87 (General Reservations of Rights), the United States covenants not  
2 to sue or to take administrative action against Settling Defendant pursuant to  
3 Sections 106 and 107(a) of CERCLA for the Work, Past Response Costs, and  
4 Future Response Costs. These covenants shall take effect upon the receipt by EPA  
5 of the payment required by Paragraph 51.a (Payments for Past Response Costs)  
6 and any Interest or stipulated penalties due thereon under Paragraph 57 (Interest)  
7 or Section XX (Stipulated Penalties). These covenants are conditioned upon the  
8 satisfactory performance by Settling Defendant of its obligations under this  
9 Consent Decree. These covenants extend only to Settling Defendant and to  
10 Settling Defendant's corporate parents and subsidiaries identified in Appendix F,  
11 and to Settling Defendant's successors, but only to the extent that the alleged  
12 liability of the corporate parent, subsidiary or successor is based on its status and in  
13 its capacity as a corporate parent, subsidiary or successor of Settling Defendant and  
14 not to the extent that the liability arose independently of the alleged liability of the  
15 Settling Defendant. These covenants do not extend to any other person.  
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22           84. Covenant for Settling Federal Agency. In consideration of the  
23 payments that will be made by the United States on behalf of Settling Federal  
24 Agency pursuant to Paragraph 53 and the 2014 Settlement Agreement, and except  
25 as specifically provided in Paragraph 87 (General Reservations of Rights), EPA  
26 covenants not to take administrative action against Settling Federal Agency  
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28

1 pursuant to Sections 106 and 107(a) of CERCLA for the Work, Past Response  
2 Costs, and Future Response Costs. EPA's covenant shall take effect upon the  
3 receipt by EPA of written confirmation from the Settling Federal Agency that the  
4 Settling Federal Agency has reimbursed Settling Defendant for Settling Federal  
5 Agency's share of EPA's Past Response Costs pursuant to Paragraph 53. EPA's  
6 covenant is conditioned upon the satisfactory performance by Settling Federal  
7 Agency of its obligations under this Consent Decree and the 2014 Settlement  
8 Agreement and upon Settling Defendant's satisfactory performance of the Work.  
9 EPA's covenant extends to Settling Federal Agency as well as any other federal  
10 government entity, or its successor, whose potential liability arises out of the  
11 production of materials at the Site prior to 1956, and does not extend to any other  
12 person.  
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18 85. Covenants for Settling Defendant by DTSC. In consideration of the  
19 actions that will be performed and the payments that will be made by Settling  
20 Defendant under this Consent Decree, and except as specifically provided in  
21 Paragraph 87 (General Reservations of Rights), DTSC covenants not to sue or take  
22 administrative action against Settling Defendant pursuant to Section 107(a) of  
23 CERCLA and California Health and Safety Code Sections 25323.5, 25355.5, and  
24 25360 relating to the Work, DTSC Past Response Costs, or DTSC Future  
25 Response Costs. These covenants shall take effect upon the receipt by DTSC of  
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1 the payment required by Paragraph 51.c (Payments for DTSC Past Response  
2 Costs) and any Interest or stipulated penalties due thereon under Paragraph 57  
3 (Interest) or Paragraph 72.b(1) (Stipulated Penalties). These covenants are  
4 conditioned upon the satisfactory performance by Settling Defendant of the Work.  
5 Any Work Takeover by EPA under Paragraph 88 of this Consent Decree shall  
6 constitute unsatisfactory performance of the Work for purposes of this Paragraph  
7 85 (Covenants for Settling Defendant by DTSC), and Paragraph 86 (Covenants for  
8 Settling Federal Agency by DTSC). These covenants extend only to Settling  
9 Defendant and to Settling Defendant's corporate parents and subsidiaries,  
10 identified in Appendix F, and Settling Defendant's successors, but only to the  
11 extent that the alleged liability of the corporate parent, subsidiary or successor is  
12 based on its status and in its capacity as a corporate parent, subsidiary or successor  
13 of Settling Defendant and not to the extent that the liability arose independently of  
14 the alleged liability of the Settling Defendant. These covenants do not extend to  
15 any other person.  
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22 86. Covenants for Settling Federal Agency by DTSC.  
23

24 In consideration of the payments that will be made by the United States on  
25 behalf of Settling Federal Agency pursuant to Paragraph 53 and the 2014  
26 Settlement Agreement, and except as specifically provided in this Paragraph 86  
27 and Paragraph 87 (General Reservations of Rights), DTSC covenants not to sue or  
28

1 take administrative action against Settling Federal Agency pursuant to Section  
2 107(a) of CERCLA and California Health and Safety Code Sections 25323.5,  
3 25355.5, and 25360 relating to the Work, DTSC Past Response Costs, or DTSC  
4 Future Response Costs. DTSC's covenants shall take effect upon the receipt by  
5 DTSC of DTSC Past Response Costs pursuant to Paragraph 51.c. DTSC's  
6 covenants are conditioned upon the satisfactory performance by Settling Federal  
7 Agency of its obligations under this Consent Decree and the 2014 Settlement  
8 Agreement and upon Settling Defendant's satisfactory performance of the Work.  
9 Any Work Takeover by EPA under Paragraph 88 shall constitute unsatisfactory  
10 performance of the Work for purposes of this Paragraph 86. Notwithstanding any  
11 other provision of this Consent Decree and in addition to its reservation of rights  
12 under Paragraph 87, DTSC reserves, and this Consent Decree is without prejudice  
13 to, DTSC's right to pursue the action titled *California Department of Toxic*  
14 *Substances Control v. United States, et al.*, to seek to compel Settling Federal  
15 Agency to pay DTSC for its Future Response Costs if, at any time, EPA  
16 implements Work Takeover under Paragraph 88. DTSC's covenants extend to the  
17 Settling Federal Agency, as well as to any other federal government entity, or its  
18 successor, if also a federal government entity, whose potential liability arises out of  
19 the production of materials at the Site for the United States prior to 1956, and do  
20 not extend to any other person.

1           87.   General Reservations of Rights. The United States and the State  
2 reserve, and this Consent Decree is without prejudice to, all rights against Settling  
3 Defendant, with respect to all matters not expressly included within Plaintiffs'  
4 covenants. EPA and the State reserve, and this Consent Decree is without  
5 prejudice to, all rights against Settling Federal Agency, with respect to all matters  
6 not expressly included within Plaintiffs' covenants. Notwithstanding any other  
7 provision of this Consent Decree, the United States and the State reserve all rights  
8 against Settling Defendant; and EPA and the State reserve, and this Consent  
9 Decree is without prejudice to, all rights against Settling Federal Agency, with  
10 respect to:  
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15           a.       liability for failure by Settling Defendant or Settling Federal  
16 Agency to meet a requirement of this Consent Decree;  
17

18           b.       liability arising from the past, present, or future disposal,  
19 release, or threat of release of Waste Material outside of the Site;  
20

21           c.       liability based on the ownership of the Site by Settling  
22 Defendant or Settling Federal Agency when such ownership commences after  
23 signature of this Consent Decree by Settling Defendant or Settling Federal Agency;  
24  
25

26           d.       liability based on the operation of the Site by Settling  
27 Defendant when such operation commences after signature of this Consent Decree  
28

1 by Settling Defendant and does not arise solely from Settling Defendant's  
2 performance of the Work and liability based on the operation of the Site by  
3 Settling Federal Agency when such operation commences after signature of this  
4 Consent Decree by Settling Federal Agency;

5  
6  
7 e. liability based on Settling Defendant's or Settling Federal  
8 Agency's transportation, treatment, storage, or disposal, or arrangement for  
9 transportation, treatment, storage, or disposal of Waste Material at or in connection  
10 with the Site, other than as provided in the ROD, the Work, or otherwise ordered  
11 by EPA, after signature of this Consent Decree by Settling Defendant or Settling  
12 Federal Agency;

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15 f. liability for damages for injury to, destruction of, or loss of  
16 natural resources, and for the costs of any natural resource damage assessments;

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19 g. criminal liability;

20  
21 h. liability for violations of federal or state law that occur during  
22 or after implementation of the Work; and

23  
24 i. liability, prior to achievement of Performance Standards in  
25 accordance with Paragraph 12 for additional response actions that EPA determines  
26 are necessary to achieve and maintain Performance Standards or to carry out and  
27  
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1 maintain the effectiveness of the remedy set forth in the ROD, but that cannot be  
2 required pursuant to Paragraph 13 (Modification of SOW or Related Work Plans);  
3

4 j. liability for additional operable units or the final response  
5 action at the Del Amo Superfund Site, including but not limited to the Waste Pits  
6 OU (OU2), the Dual Site Groundwater OU (OU3), and the areas known as  
7 Properties 29 and 34; and  
8

9  
10 k. liability for costs that the United States and DTSC will incur  
11 regarding the Site but that are not within the definition of Future Response Costs or  
12 DTSC Future Response Costs.  
13

14 88. Work Takeover.  
15

16 a. In the event EPA determines that Settling Defendant has  
17 (1) ceased implementation of any portion of the Work, or (2) is seriously or  
18 repeatedly deficient or late in its performance of the Work, or (3) is implementing  
19 the Work in a manner that may cause an endangerment to human health or the  
20 environment, EPA may issue a written notice (“Work Takeover Notice”) to  
21 Settling Defendant. Any Work Takeover Notice issued by EPA will specify the  
22 grounds upon which such notice was issued and will provide Settling Defendant a  
23 period of 10 days within which to remedy the circumstances giving rise to EPA’s  
24 issuance of such notice.  
25  
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1           b.       If, after expiration of the ten-day notice period specified in  
2 Paragraph 88.a, Settling Defendant has not remedied to EPA’s satisfaction the  
3  
4 circumstances giving rise to EPA’s issuance of the relevant Work Takeover  
5 Notice, EPA may at any time thereafter assume the performance of all or any  
6  
7 portion(s) of the Work as EPA deems necessary (“Work Takeover”). EPA will  
8  
9 notify Settling Defendant in writing (which writing may be electronic) if EPA  
10  
11 determines that implementation of a Work Takeover is warranted under this  
12 Paragraph 88.b. Funding of Work Takeover costs is addressed under  
13 Paragraph 45.

14           c.       Settling Defendant may invoke the procedures set forth in  
15 Paragraph 68 (Record Review), to dispute EPA’s implementation of a Work  
16  
17 Takeover under Paragraph 88.b. However, notwithstanding Settling Defendant’s  
18  
19 invocation of such dispute resolution procedures, and during the pendency of any  
20  
21 such dispute, EPA may in its sole discretion commence and continue a Work  
22  
23 Takeover under Paragraph 88.b until the earlier of (1) the date that Settling  
24  
25 Defendant remedies, to EPA’s satisfaction, the circumstances giving rise to EPA’s  
26  
27 issuance of the relevant Work Takeover Notice, or (2) the date that a final decision  
28 is rendered in accordance with Paragraph 68 (Record Review) requiring EPA to  
terminate such Work Takeover.

89.   Notwithstanding any other provision of this Consent Decree, the

1 United States and the State retain all authority and reserve all rights to take any and  
2 all response actions authorized by law.  
3

4 XXII. COVENANTS BY SETTLING DEFENDANT AND SETTLING  
5 FEDERAL AGENCY

6 90. Covenants by Settling Defendant. Subject to the reservations in  
7 Paragraph 93, Settling Defendant covenants not to sue and agrees not to assert any  
8 claims or causes of action against the United States or the State with respect to the  
9 Work, past response actions regarding the Site except for those relating to  
10 Operable Unit 3, Past Response Costs, Future Response Costs, DTSC Past  
11 Response Costs, DTSC Future Response Costs, Settling Defendant's Past  
12 Response Costs, Settling Defendant's Future Response Costs, and this Consent  
13 Decree, including, but not limited to:  
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17 a. any direct or indirect claim for reimbursement from the EPA  
18 Hazardous Substance Superfund through CERCLA Sections 106(b)(2), 107, 111,  
19 112 or 113, or any other provision of law;  
20  
21

22 b. any claims under CERCLA Sections 107 or 113, RCRA  
23 Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Work, past  
24 response actions regarding the Site, Past Response Costs, Future Response Costs,  
25 DTSC Past Response Costs, DTSC Future Response Costs, Settling Defendant's  
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1 Past Response Costs, Settling Defendant's Future Response Costs, and this  
2 Consent Decree; or  
3

4 c. any claims arising out of response actions at or in connection  
5 with the Site, including any claim under the United States Constitution, the State  
6 Constitution, the Tucker Act, 28 U.S.C. §1491, the Equal Access to Justice Act,  
7 28 U.S.C. § 2412, or at common law.  
8

9  
10 91. Covenant by Settling Federal Agency. Settling Federal Agency  
11 agrees not to assert any direct or indirect claim for reimbursement from the EPA  
12 Hazardous Substance Superfund through CERCLA Sections 106(b)(2), 107, 111,  
13 112, or 113, or any other provision of law with respect to the Work, past response  
14 actions regarding the Site, Past Response Costs, Future Response Costs, Settling  
15 Defendant's Past Response Costs, Settling Defendant's Future Response Costs,  
16 and this Consent Decree. This covenant does not preclude demand for  
17 reimbursement from the Superfund of costs incurred by a Settling Federal Agency  
18 in the performance of its duties (other than pursuant to this Consent Decree) as  
19 lead or support agency under the National Contingency Plan (40 C.F.R. Part 300).  
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24 92. Except as provided in Paragraph 102 (Res Judicata and Other  
25 Defenses), the covenants in this Section shall not apply if the United States or the  
26 State brings a cause of action or issues an order pursuant to any of the reservations  
27  
28

1 in Section XXI (Covenants by Plaintiffs), other than in Paragraphs 87.a (claims for  
2 failure to meet a requirement of the Consent Decree), 87.g (criminal liability), and  
3 87.h (violations of federal/state law during or after implementation of the Work),  
4 but only to the extent that Settling Defendant's claims arise from the same  
5 response action, response costs, or damages that the United States or DTSC is  
6 seeking pursuant to the applicable reservation.  
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9  
10 93. Settling Defendant reserves, and this Consent Decree is without  
11 prejudice to, claims against the United States (1) to enforce the terms of the 2014  
12 Settlement Agreement; or (2) subject to the provisions of Chapter 171 of Title 28  
13 of the United States Code, and brought pursuant to any statute other than CERCLA  
14 or RCRA and for which the waiver of sovereign immunity is found in a statute  
15 other than CERCLA or RCRA, for money damages for injury or loss of property or  
16 personal injury or death caused by the negligent or wrongful act or omission of any  
17 employee of the United States, as that term is defined in 28 U.S.C. § 2671, while  
18 acting within the scope of his or her office or employment under circumstances  
19 where the United States, if a private person, would be liable to the claimant in  
20 accordance with the law of the place where the act or omission occurred.  
21

22  
23 However, the foregoing shall not include any claim based on EPA's selection of  
24 response actions, or the oversight or approval of Settling Defendant's plans,  
25 reports, other deliverables or activities. Settling Defendant also reserves, and this  
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28

1 Consent Decree is without prejudice to, contribution claims against Settling  
2 Federal Agency in the event any claim is asserted by the United States or the State  
3  
4 against Settling Defendant pursuant to any of the reservations in Section XXI  
5 (Covenants by Plaintiffs) other than in Paragraphs 87.a (claims for failure to meet a  
6  
7 requirement of the Consent Decree), 87.g (criminal liability), and 87.h (violations  
8  
9 of federal/state law during or after implementation of the Work), but only to the  
10  
11 extent that Settling Defendant's claims arise from the same response action,  
12  
13 response costs, or damages that the United States or the State is seeking pursuant to  
14  
15 the applicable reservation.

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

18 95. Claims Against De Micromis Parties. Settling Defendant agrees not  
19  
20 to assert any claims and to waive all claims or causes of action (including but not  
21  
22 limited to claims or causes of action under Sections 107(a) and 113 of CERCLA)  
23  
24 that it may have for all matters relating to the Site against any person where the  
25  
26 person's liability to Settling Defendant with respect to the Site is based solely on  
27  
28 having arranged for disposal or treatment, or for transport for disposal or treatment,  
of hazardous substances at the Site, or having accepted for transport for disposal or  
treatment of hazardous substances at the Site, if all or part of the disposal,

1 treatment, or transport occurred before April 1, 2001, and the total amount of  
2 material containing hazardous substances contributed by such person to the Site  
3 was less than 110 gallons of liquid materials or 200 pounds of solid materials.  
4

5           96. The waiver in Paragraph 95 (Claims Against De Micromis Parties)  
6 shall not apply with respect to any defense, claim, or cause of action that Settling  
7 Defendant may have against any person meeting the criteria in Paragraph 95 if  
8 such person asserts a claim or cause of action relating to the Site against Settling  
9 Defendant. This waiver also shall not apply to any claim or cause of action against  
10 any person meeting the criteria in Paragraph 95 if EPA determines:  
11  
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13           a. that such person has failed to comply with any EPA requests for  
14 information or administrative subpoenas issued pursuant to Section 104(e) or  
15 122(e) of CERCLA, 42 U.S.C. §9604(e) or 9622(e), or Section 3007 of RCRA, 42  
16 U.S.C. §6927, or has impeded or is impeding, through action or inaction, the  
17 performance of a response action or natural resource restoration with respect to the  
18 Site, or has been convicted of a criminal violation for the conduct to which this  
19 waiver would apply and that conviction has not been vitiated on appeal or  
20 otherwise; or  
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23           b. that the materials containing hazardous substances contributed  
24 to the Site by such person have contributed significantly, or could contribute  
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1 significantly, either individually or in the aggregate, to the cost of response action  
2 or natural resource restoration at the Site.  
3

4 97. Claims Against *De Minimis* and Ability to Pay Parties. Settling  
5 Defendant agrees not to assert any claims or causes of action and to waive all  
6 claims or causes of action (including but not limited to claims or causes of action  
7 under Sections 107(a) and 113 of CERCLA) that it may have for response costs  
8 relating to the Site against any person that has entered or in the future enters into a  
9 final CERCLA Section 122(g) *de minimis* settlement, or a final settlement based on  
10 limited ability to pay, with EPA with respect to the Site. This waiver shall not  
11 apply with respect to any defense, claim, or cause of action that Settling Defendant  
12 may have against any person if such person asserts a claim or cause of action  
13 relating to the Site against Settling Defendant.  
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18 XXIII. EFFECT OF SETTLEMENT; CONTRIBUTION  
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20 98. Nothing in this Consent Decree shall be construed to create any rights  
21 in, or grant any cause of action to, any person not a Party to this Consent Decree.  
22 Each of the Parties expressly reserves any and all rights (including, but not limited  
23 to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims,  
24 demands, and causes of action that each Party may have with respect to any matter,  
25 transaction, or occurrence relating in any way to the Site against any person not a  
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1 Party hereto. Nothing in this Consent Decree diminishes the right of the United  
2 States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-  
3 (3), to pursue any such persons to obtain additional response costs or response  
4 action and to enter into settlements that give rise to contribution protection  
5 pursuant to Section 113(f)(2).  
6  
7

8 99. The Parties agree, and by entering this Consent Decree this Court  
9 finds, that this Consent Decree constitutes a judicially approved settlement for  
10 purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that  
11 Settling Defendant and Settling Federal Agency are entitled, as of the Effective  
12 Date, to protection from contribution actions or claims as provided by  
13 Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for  
14 “matters addressed” in this Consent Decree. The “matters addressed” in this  
15 Consent Decree are the Work, Past Response Costs, Future Response Costs, DTSC  
16 Past Response Costs, DTSC Future Response Costs, Settling Defendant’s Past  
17 Response Costs, and Settling Defendant’s Future Response Costs.  
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23 100. Settling Defendant shall, with respect to any suit or claim brought by  
24 it for matters related to this Consent Decree, notify the United States and DTSC in  
25 writing no later than 60 days prior to the filing of such suit or claim.  
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1           101. Settling Defendant shall, with respect to any suit or claim brought  
2 against it for matters related to this Consent Decree, notify in writing the United  
3 States and DTSC within 10 days after service of the complaint on Settling  
4 Defendant. In addition, Settling Defendant shall notify the United States and  
5 DTSC within ten days after service or receipt of any Motion for Summary  
6 Judgment and within 10 days after receipt of any order from a court setting a case  
7 for trial.  
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11           102. Res Judicata and Other Defenses. In any subsequent administrative or  
12 judicial proceeding initiated by the United States or DTSC for injunctive relief,  
13 recovery of response costs, or other appropriate relief relating to the Site, Settling  
14 Defendant and, with respect to an action by DTSC, Settling Federal Agency shall  
15 not assert, and may not maintain, any defense or claim based upon the principles of  
16 waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other  
17 defenses based upon any contention that the claims raised by the United States or  
18 DTSC in the subsequent proceeding were or should have been brought in the  
19 instant case; provided, however, that nothing in this Paragraph affects the  
20 enforceability of the covenants not to sue set forth in Section XXI (Covenants by  
21 Plaintiffs).  
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1 XXIV. ACCESS TO INFORMATION

2  
3 103. Settling Defendant shall provide to EPA and DTSC, upon request,  
4 copies of all records, reports, documents, and other information (including records,  
5 reports, documents, and other information in electronic form) (hereinafter referred  
6 to as “Records”) within its possession or control or that of its contractors or agents  
7 relating to the implementation of this Consent Decree, including, but not limited to,  
8 sampling, analysis, chain of custody records, manifests, trucking logs, receipts,  
9 reports, sample traffic routing, correspondence, or other documents or information  
10 regarding the Work. Settling Defendant shall also make available to EPA and  
11 DTSC, for purposes of investigation, information gathering, or testimony, its  
12 employees, agents, or representatives with knowledge of relevant facts concerning  
13 the performance of the Work.  
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18 104. Business Confidential and Privileged Documents.

19  
20 a. Settling Defendant may assert business confidentiality claims  
21 covering part or all of the Records submitted to Plaintiffs under this Consent  
22 Decree to the extent permitted by and in accordance with Section 104(e)(7) of  
23 CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Records determined  
24 to be confidential by EPA will be afforded the protection specified in 40 C.F.R.  
25 Part 2, Subpart B. If no claim of confidentiality accompanies Records when they  
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1 are submitted to EPA and DTSC, or if EPA has notified Settling Defendant that the  
2 Records are not confidential under the standards of Section 104(e)(7) of CERCLA  
3 or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records  
4 without further notice to Settling Defendant.  
5

6  
7 b. Settling Defendant may assert that certain Records are  
8 privileged under the attorney-client privilege or any other privilege recognized by  
9 federal law. If Settling Defendant asserts such a privilege in lieu of providing  
10 Records, it shall provide Plaintiffs with the following: (1) the title of the Record;  
11 (2) the date of the Record; (3) the name, title, affiliation (e.g., company or firm),  
12 and address of the author of the Record; (4) the name and title of each addressee  
13 and recipient; (5) a description of the contents of the Record; and (6) the privilege  
14 asserted by Settling Defendant. If a claim of privilege applies only to a portion of  
15 a Record, the Record shall be provided to the United States and DTSC in redacted  
16 form to mask the privileged portion only. Settling Defendant shall retain all  
17 Records that it claims to be privileged until the United States or DTSC has had a  
18 reasonable opportunity to dispute the privilege claim and any such dispute has  
19 been resolved in the Settling Defendant's favor.  
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22  
23 c. No Records created or generated pursuant to the requirements  
24 of this Consent Decree shall be withheld from the United States or DTSC on the  
25 grounds that they are privileged or confidential.  
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1 addition, copies of all data generated during the performance of the Work and not  
2 contained in the aforementioned Records required to be retained. Each of the  
3 above record retention requirements shall apply regardless of any corporate  
4 retention policy to the contrary.  
5

6  
7 107. The United States acknowledges that Settling Federal Agency (a) is  
8 subject to all applicable Federal record retention laws, regulations, and policies;  
9 and (b) has certified that it has fully complied with any and all EPA and DTSC  
10 requests for information regarding the Site pursuant to Sections 104(e) and 122(e)  
11 of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA,  
12 of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA,  
13 42 U.S.C. § 6927, and California law.  
14

15  
16 108. At the conclusion of this record retention period, Settling Defendant  
17 shall notify the United States and DTSC at least 90 days prior to the destruction of  
18 any such Records, and, upon request by the United States or DTSC, Settling  
19 Defendant shall deliver any such Records to EPA or DTSC. Settling Defendant  
20 may assert that certain Records are privileged under the attorney-client privilege or  
21 any other privilege recognized by federal law. If Settling Defendant asserts such a  
22 privilege, it shall provide Plaintiffs with the following: (a) the title of the Record;  
23 (b) the date of the Record; (c) the name, title, affiliation (e.g., company or firm),  
24 and address of the author of the Record; (d) the name and title of each addressee  
25 and recipient; (e) a description of the subject of the Record; and (f) the privilege  
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1 asserted by Settling Defendant. If a claim of privilege applies only to a portion of  
2 a Record, the Record shall be provided to the United States and DTSC in redacted  
3 form to mask the privileged portion only. Settling Defendant shall retain all  
4 Records that it claims to be privileged until the United States or DTSC has had a  
5 reasonable opportunity to dispute the privilege claim and any such dispute has  
6 been resolved in the Settling Defendant's favor. However, no Records created or  
7 generated pursuant to the requirements of this Consent Decree shall be withheld on  
8 the grounds that they are privileged or confidential.  
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12  
13 109. Settling Defendant certifies that, to the best of its knowledge and  
14 belief, after reasonable inquiry, it has not altered, mutilated, discarded, destroyed,  
15 or otherwise disposed of any Records (other than identical copies) relating to its  
16 potential liability regarding the Site since the earlier of notification of potential  
17 liability by the United States or DTSC or the filing of suit against it regarding the  
18 Site and that it has fully complied with any and all EPA and DTSC requests for  
19 information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA,  
20 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927,  
21 and California law.  
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1 XXVI. NOTICES AND SUBMISSIONS

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3 110. Whenever, under the terms of this Consent Decree, written notice is  
4 required to be given or a report or other document is required to be sent by one  
5 Party to another, it shall be directed to the individuals at the addresses specified  
6 below, unless those individuals or their successors give notice of a change to the  
7 other Parties in writing. All notices and submissions shall be considered effective  
8 upon receipt, unless otherwise provided. Written notice as specified in this Section  
9 shall constitute complete satisfaction of any written notice requirement of the  
10 Consent Decree with respect to the United States, EPA, Settling Federal Agency,  
11 DTSC, and Settling Defendant, respectively. Notices required to be sent to EPA,  
12 and not to the United States, under the terms of this Consent Decree should not be  
13 sent to the U.S. Department of Justice.  
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19 As to the United States: Chief, Environmental Enforcement  
20 Section  
21 Environment and Natural Resources  
22 Division  
23 U.S. Department of Justice  
24 P.O. Box 7611  
25 Washington, D.C. 20044-7611  
26 Re: DJ # 90-11-2-933/4

27 and: Chief, Environmental Defense Section  
28 Environment and Natural Resources  
Division  
U.S. Department of Justice

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P.O. Box 23986  
Washington, D.C. 20026-3986  
Re: DJ # 90-11-3-21 and # 90-11-3-1204

As to EPA:

Director, Superfund Division  
United States Environmental Protection  
Agency  
Region IX  
75 Hawthorne St.  
San Francisco, CA 94105

and:

Dante Rodriguez  
EPA Project Coordinator  
United States Environmental Protection  
Agency  
Region IX  
75 Hawthorne St.  
San Francisco, CA 94105

As to the Regional Financial  
Management Officer:

Regional Financial Management Officer  
United States Environmental Protection  
Agency  
Region IX  
75 Hawthorne St.  
San Francisco, CA 94105

As to DTSC:

Safouh Sayed  
State Project Coordinator  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, CA 90630

As to Settling Defendant:

Carol Campagna  
Settling Defendant's Project Coordinator  
Shell Oil Products US  
20945 S. Wilmington Ave.  
Carson, CA 90749



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Kimberly Lesniak  
Shell Oil Company  
Senior Legal Counsel,  
Legal Department - Downstream  
Manufacturing & Environmental  
Regulatory  
One Shell Plaza  
910 Louisiana St.  
Houston, TX 77002

XXVII. RETENTION OF JURISDICTION

111. This Court retains jurisdiction over both the subject matter of this Consent Decree, Settling Federal Agency, and Settling Defendant 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 apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIX (Dispute Resolution), or to allow DTSC to pursue the action titled *California Department of Toxic Substances Control v. United States, et al.*, against Settling Federal Agency in the event that EPA implements Work Takeover under Paragraph 88 of this Consent Decree.

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XXVIII. APPENDICES

112. The following appendices are attached to and incorporated into this

Consent Decree:

“Appendix A” is the ROD.

“Appendix B” is the SOW.

“Appendix C” is the description and/or map of the Site.

“Appendix D” is the draft form of Proprietary Controls.

“Appendix E” is the draft performance guarantee.

“Appendix F” is the list of Settling Defendant’s corporate parents and subsidiaries.

XXIX. COMMUNITY INVOLVEMENT

113. If requested by EPA or DTSC, Settling Defendant shall participate in community involvement activities pursuant to the community involvement plan to be developed by EPA. EPA will determine the appropriate role for Settling Defendant under the Plan. Settling Defendant shall also cooperate with EPA and DTSC in providing information regarding the Work to the public. As requested by EPA or DTSC, Settling Defendant shall participate in the preparation of such information for dissemination to the public and in public meetings that may be held

1 or sponsored by EPA or DTSC to explain activities at or relating to Operable Unit

2 1. Costs incurred by the United States under this Section, including the costs of  
3 any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C.

4 § 9617(e), shall be considered Future Response Costs that Settling Defendant shall  
5 pay pursuant to Section XVI (Payments for Response Costs).  
6  
7

8 **XXX. MODIFICATION**  
9

10 114. Except as provided in Paragraph 13 (Modification of SOW or Related  
11 Work Plans), material modifications to this Consent Decree, including the SOW,  
12 shall be in writing, signed by the United States and Settling Defendant, and shall  
13 be effective upon approval by the Court. Except as provided in Paragraph 13, non-  
14 material modifications to this Consent Decree, including the SOW, shall be in  
15 writing and shall be effective when signed by duly authorized representatives of  
16 the United States and Settling Defendant. All modifications to the Consent  
17 Decree, other than the SOW, also shall be signed by DTSC, or a duly authorized  
18 representative of DTSC, as appropriate. A modification to the SOW shall be  
19 considered material if it fundamentally alters the basic features of the selected  
20 remedy within the meaning of 40 C.F.R. § 300.435(c)(2)(ii). Before providing its  
21 approval to any modification to the SOW, the United States will provide DTSC  
22 with a reasonable opportunity to review and comment on the proposed  
23 modification.  
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1           115. Nothing in this Consent Decree shall be deemed to alter the Court's  
2 power to enforce, supervise, or approve modifications to this Consent Decree.  
3

4           XXXI.        LODGING AND OPPORTUNITY FOR PUBLIC COMMENT  
5

6           116. This Consent Decree shall be lodged with the Court for a period of not  
7 less than 30 days for public notice and comment in accordance with  
8 Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The  
9 United States reserves the right to withdraw or withhold its consent if the  
10 comments regarding the Consent Decree disclose facts or considerations that  
11 indicate that the Consent Decree is inappropriate, improper, or inadequate.  
12

13 Settling Defendant consents to the entry of this Consent Decree without further  
14 notice.  
15  
16

17           117. If for any reason the Court should decline to approve this Consent  
18 Decree in the form presented, this agreement is voidable at the sole discretion of  
19 any Party and the terms of the agreement may not be used as evidence in any  
20 litigation between the Parties.  
21  
22

23                           XXXII.        SIGNATORIES/SERVICE  
24

25           118. The undersigned representative of Settling Defendant to this Consent  
26 Decree and the Assistant Attorney General for the Environment and Natural  
27 Resources Division of the Department of Justice and the undersigned  
28

1 representative for DTSC each certify that he or she is fully authorized to enter into  
2 the terms and conditions of this Consent Decree and to execute and legally bind  
3 such Party to this document.  
4

5           119. Settling Defendant agrees not to oppose entry of this Consent Decree  
6 by this Court or to challenge any provision of this Consent Decree unless the  
7 United States has notified Settling Defendant in writing that it no longer supports  
8 entry of the Consent Decree.  
9  
10

11           120. Settling Defendant shall identify, on the attached signature page, the  
12 name, address, and telephone number of an agent who is authorized to accept  
13 service of process by mail on behalf of that Party with respect to all matters arising  
14 under or relating to this Consent Decree. Settling Defendant agrees to accept  
15 service in that manner and to waive the formal service requirements set forth in  
16 Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of  
17 this Court, including, but not limited to, service of a summons. Settling Defendant  
18 need not file an answer to the complaints in this action unless or until the Court  
19 expressly declines to enter this Consent Decree.  
20  
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24   XXXIII.     FINAL JUDGMENT

25  
26           211. This Consent Decree and its appendices constitute the final, complete,  
27 and exclusive agreement and understanding among the Parties regarding the  
28

1 settlement embodied in the Consent Decree. The Parties acknowledge that there  
2 are no representations, agreements, or understandings relating to the settlement  
3  
4 other than those expressly contained in this Consent Decree or in the 2014  
5 Settlement Agreement.  
6

7 122. Upon entry of this Consent Decree by the Court, this Consent Decree  
8 shall constitute a final judgment between and among the United States, DTSC, and  
9 Settling Defendant. The Court finds that there is no just reason for delay and  
10 therefore enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.  
11  
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14 SO ORDERED THIS \_\_ DAY OF \_\_\_\_\_, 20\_\_.  
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19 \_\_\_\_\_  
20 United States District Judge  
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1 Signature Page for Consent Decree regarding the Del Amo Facility Superfund Site

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**FOR THE UNITED STATES OF AMERICA:**

8/24/2015  
Date



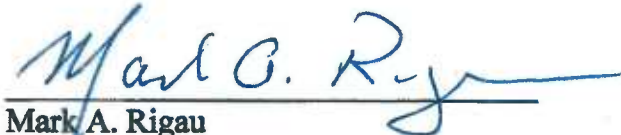
John C. Cruden  
Assistant Attorney General  
Environment and Natural Resources Division  
U.S. Department of Justice  
Washington, D.C. 20530

9/25/15  
Date



Valerie K. Mann  
Trial Attorney  
Environmental Enforcement Section  
Environment and Natural Resources Division  
U.S. Department of Justice  
P.O. Box 7611  
Washington, D.C. 20044-7611

9/25/15  
Date

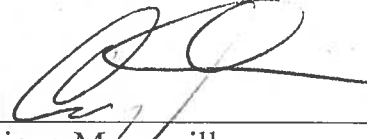


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Signature Page for Consent Decree regarding the Del Amo Facility Superfund Site

8/20/15



Date

Enrique Manzanilla  
Director, Superfund Division, Region IX  
U.S. Environmental Protection Agency  
75 Hawthorne St.  
San Francisco, CA 94105

8/16/15



Date

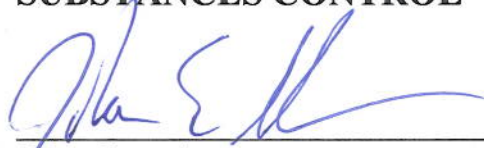
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1 Signature Page for Consent Decree regarding the Del Amo Facility Superfund Site

2  
3 **FOR THE STATE OF CALIFORNIA**  
4 **DEPARTMENT OF TOXIC**  
5 **SUBSTANCES CONTROL**

6  
7 Sept. 16, 2015  
8 Date



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Signature Page for Consent Decree regarding the Del Amo Facility Superfund Site

**FOR SHELL OIL COMPANY, INC.**

9-25-15  
Date

  
Name (print):

Title:

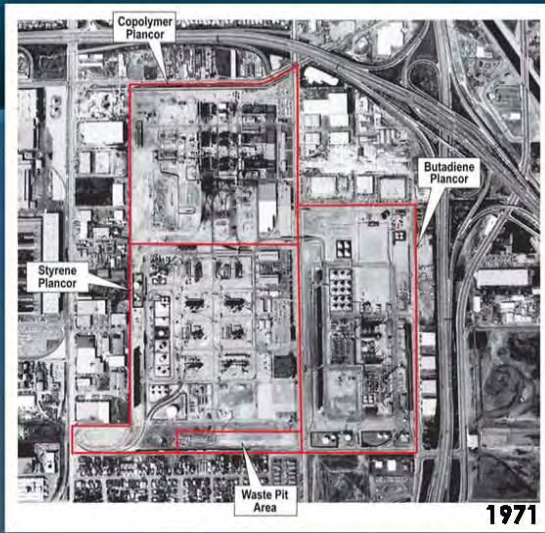
Address:

Agent Authorized to Accept  
Service on Behalf of Above-  
signed Party:

CT Corporation System  
818 West Seventh Street, 2<sup>nd</sup> Floor  
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Phone: 213-627-8252

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**APPENDIX A**  
**RECORD OF DECISION (“ROD”)**



# Record of Decision

## Del Amo Facility Superfund Site Soil and NAPL Operable Unit

Los Angeles, CA  
September 30, 2011



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**ACRONYMS**

5YR	5-Year Review
ADD	average daily dose
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BEC	building engineering control
bgs	below ground surface
BRA	Baseline Risk Assessment
BTEX	benzene, toluene, ethylbenzene, and xylene
CC&Rs	Covenants, Conditions and Restrictions
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
cfm	cubic feet per minute
CHHSL	California Human Health Screening Levels
COC	chemical of concern
COPC	chemical of potential concern
CSF	cancer slope factor
CSM	Conceptual Site Model
CT	central tendency
CY	cubic yard(s)
DAAC	Del Amo Action Committee
DDT	dichlorodiphenyltrichloroethane
DHS	State of California Department of Health Services
DL	detection limit
DNAPL	dense nonaqueous phase liquid
DTSC	California Department of Toxic Substances Control
EAPC	exposure area of potential concern
EPA	United States Environmental Protection Agency
EPC	exposure point concentration
ERA	Ecological Risk Assessment
ERT	Environmental Review Team
ERH	electrical resistance heating
FID	flame ionization detector
FS	Feasibility Study
H&S	health and safety
HI	hazard index
HVAC	heating, ventilating, and air conditioning
IC	institutional control
ISCO	in-situ chemical oxidation
ISSH	in-situ soil heating
LADD	lifetime average daily dose
LADWP	Los Angeles Department of Water and Power

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LBF	Lower Bellflower Aquitard
LNAPL	light nonaqueous phase liquid
MBFB	Middle Bellflower B Sand
MBFC	Middle Bellflower C Sand
MBFM	Middle Bellflower Mud
MCL	maximum contaminant level
NAPL	nonaqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDPA	n-nitrosodiphenylamine
NPL	National Priorities List
O&M	operations and maintenance
ODCs	other direct costs
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
pCBSA	parachlorobenzene sulfonic acid
PCE	tetrachloroethene
PHA	Public Health Assessment
PID	photoionization detector
PRG	preliminary remediation goal
PRP	potentially responsible party
RAGS	Risk Assessment Guidance for Superfund
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RfD	reference dose
RI	remedial investigation
RME	reasonable maximum exposure
ROD	Record of Decision
ROST	Rapid Optical Screening Tool
RSL	Regional Screening Levels
SA	source area
SESR	Screening Evaluation Summary Report
sf	square feet
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TCE	trichloroethene
TI	Technical Impracticability
TPH	total petroleum hydrocarbon(s)
TMV	toxicity, mobility and volume
TRV	toxicity reference value
UBF	Upper Bellflower Aquitard
U.S.	United States

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UVOST	Ultraviolet Optical Screening Tool
VETS	vapor extraction and treatment system
VOC	volatile organic compound
ZIMAS	Zoning Information and Map Access System

## **PART I      DECLARATION**

### **1.0      Site Name and Location**

Del Amo Facility Superfund Site  
EPA #CAD029544731  
Operable Unit 1 – “Soil and NAPL”  
Los Angeles, CA

The Site is located within the Harbor Gateway portion of the City of Los Angeles, at the southwest corner of the intersection of the 405 and 110 freeways, adjacent to the cities of Torrance to the west and Carson to the east.

### **2.0      Statement of Basis and Purpose**

This decision document presents the Selected Remedy for the Del Amo Facility Superfund Site Operable Unit 1 in Los Angeles, California, which was chosen in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the NCP. This decision is based on the Administrative Record file for this site.

The State of California concurs with the Selected Remedy.

### **3.0      Assessment of the Site**

The response actions selected in this Record of Decision are necessary to protect the public health or welfare or the environment from actual releases of hazardous substances, pollutants and contaminants into the environment which may present an imminent and substantial endangerment to public health or welfare.

### **4.0      Description of the Selected Remedy**

The Selected Remedy addresses Operable Unit 1, “Soils and NAPL,” and is the third Operable Unit ROD for the Site. The overall Site cleanup strategy involved addressing the Waste Pits (Operable Unit 2) first, due to the imminent hazard it posed to neighboring residences. Next, EPA addressed the Dual-Site Groundwater (Operable Unit 3), due to its potential for migration. Operable Unit 3 is known as the “dual-site” operable unit because it addresses the groundwater, which has co-mingled contamination from the Del Amo Site and the neighboring Montrose Superfund Site. The Waste Pits OU ROD was signed in 1997, and the Dual-Site Groundwater OU ROD was signed in 1999. The Soils and NAPL contamination (Operable Unit 1) was not found to cause a short-term risk with the Site in its current configuration and thus is being addressed after the other two Operable Units.

The Selected Remedy addresses source materials (NAPL and vadose soil contamination) constituting principal threats by reducing their mass to the extent practicable given the constraints of the selected technology and the current land-use (i.e., land currently being utilized by active business operations).

The major components of the Selected Remedy are:

(a) **Institutional Controls, including:**

- (1) Informational Outreach

## PART I DECLARATION

- (2) Permit Review Institutional Control in all areas, to be implemented cooperatively by the City of Los Angeles Planning Department and Building and Safety Department, EPA, California Department of Toxic Substances Control (DTSC), and potentially responsible parties (PRPs);
- (3) City of Los Angeles General Plan footnote Institutional Control in 26 areas;
- (4) Restrictive Covenant Institutional Control in 26 areas (26 separate land parcels), to be implemented by EPA, DTSC, PRPs, and the property owners;
- (b) **Capping shallow soil in 4 areas.** The performance standard for capping is to contain non-VOC and VOC contaminated shallow soil where the concentrations in soil would pose a cancer risk exceeding 1E-6 or a non-cancer hazard index exceeding 1.0 if exposure were to occur to property occupants in a commercial-use setting.
- (c) **Building Engineering Controls in one building.** The performance standard for building engineering controls is to prevent unacceptable indoor air exposures of Site-related VOC contaminants to building occupants by reducing the indoor air concentrations of target VOC constituents to commercial RSL/CHHSL criteria, or to background.
- (d) **Soil Vapor Extraction in shallow outdoor soil in 3 areas and beneath one building.** The performance standard is the same for both the shallow outdoor soil and the shallow soil beneath the building, for the known VOC constituents that exceed action levels. The performance standard is to clean the soils to the level where the concentrations in soil would not pose a cancer risk exceeding 1E-6 or a non-cancer hazard index of 1.0 if exposure were to occur to property occupants in a commercial-use setting.
- (e) **Soil Vapor Extraction in deep soil in 4 areas and In-Situ Chemical Oxidation in the saturated zone in 3 areas.** The performance standard for both ISCO and SVE in deep soil is contaminant mass removal to the extent practicable with the ISCO and SVE technologies, to the point of diminishing returns (i.e., until there is relatively little change in site conditions with continued vapor extraction or oxidant application).
- (f) **Excavation,** for any areas of site-related contamination exceeding action levels encountered in the future during development or construction. If excavation is not implementable, the remedy will be Soil Vapor Extraction for VOCs, or capping for non-VOC, with implementation of a Restrictive Covenant Institutional Control (if not one already).

## 5.0 Statutory Determinations

### 5.1 Statutory Requirements

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

### 5.2 Statutory Preference for Treatment

This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

PART I DECLARATION

**5.3 Five-Year Review Requirements**

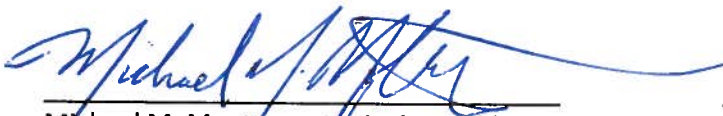
Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

**6.0 ROD Data Certification Checklist**

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site.

- (a) Chemicals of concern and their respective concentrations. (Table 5-1, p.44; Table 7-1, pp.56-59)
- (b) Baseline risk represented by the chemicals of concern. (Table 7-1, pp. 56-59)
- (c) Cleanup levels established for chemicals of concern and the basis for these levels. (Section 12.4.2, pp.136-141)
- (d) How source materials constituting principal threats are addressed. (Section 11.3, p.102)
- (e) Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD. (Section 6.0, p.51, and Section 12.4.1, p.136)
- (f) Potential land and ground-water use that will be available at the site as a result of the Selected Remedy. (Section 12.4.1, p.136)
- (g) Estimated capital, O&M, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected. (Table 12-5, p.118)
- (h) Key factors that led to selecting the remedy. (Section 12.1, pp.103-108)

**7.0 Authorizing Signature**



Michael M. Montgomery, Assistant Director  
Superfund Division

September 30, 2011

DATE



## **PART II DECISION SUMMARY**

### **1.0 Site Name, Location, Description**

The Del Amo Facility Superfund Site (Del Amo Site; EPA #CAD029544731) is located in the Harbor Gateway area of Los Angeles, at the southwest corner of the intersection of the 405 and 110 freeways, adjacent to the cities of Torrance to the west and Carson to the east.

The Del Amo Site is the former location of a 280-acre synthetic rubber manufacturing plant, constructed in 1942 to produce rubber for World War II. The former plant operated from 1942 through 1972, after which the plant was sold, decommissioned, and redeveloped into the current business park. The former plant used benzene, ethylbenzene, propane, butylene, butane, styrene, and 1,3-butadiene (and lesser amounts of other chemicals) to create synthetic rubber. During its operations, chemicals were released into soil and groundwater beneath the plant. Some of the plant's releases were leaks from pipelines, storage tanks, and processing units. Plant operators also disposed of waste in unlined pits and ponds. These chemical releases contaminated soil and groundwater beneath the former rubber plant facilities.

The Del Amo Site is currently redeveloped and is primarily used for warehousing, manufacturing, and office space.

The United States Environmental Protection Agency (EPA) is the lead agency and the California Department of Toxic Substances Control (DTSC) is the support agency.

The site comprises three operable units (OU): OU-1 – Soil and nonaqueous phase liquid (NAPL), OU-2 – Waste Pits Area, and OU-3 – Dual Site Groundwater. This Record of Decision (ROD) addresses the Soil and NAPL OU (OU-1).





## 2.0 Site History and Enforcement Actions

### 2.1 Owners and Operators

The Del Amo Site was originally established in the 1940s for construction of a chemical plant to produce synthetic rubber to support defense efforts during World War II.

Initially the plant was owned by subsidiaries of the United States (U.S.) government and operated by private companies under lease, until it was purchased by Shell Chemical Company ("Shell") in 1955. Shell operated the plant until 1972 when it was sold to a land developer and the facility was dismantled; the property was sold off in parcels to other private owners and developers.

The 280-acre former plant site currently consists of 82 parcels and is almost completely redeveloped with industrial and commercial facilities used primarily for warehouse storage/shipping, manufacturing, and office space.

### 2.2 Plant Operations and Releases

#### Operations

The synthetic rubber plant consisted of three interrelated plantors: the butadiene and styrene plantors, where the primary chemical components were produced, and the copolymer plantor, where the butadiene and styrene were polymerized to produce synthetic rubber. See Figure 2-1. The styrene plantor was located in the southwestern portion of the plant. Its primary chemical feedstocks were benzene and propane. The propane was cracked to produce ethylene, which was then reacted with the benzene to produce ethylbenzene. The ethylbenzene was then converted to styrene through a dehydrogenation process.

The butadiene plantor was located in the southeastern portion of the plant. Butadiene production feedstocks included a gas mixture of butane, butylene, and butadiene that was received via pipeline and tanker truck. Butadiene was separated from the feedstock through distillation and purification steps, and additional butadiene production was achieved through catalytic dehydrogenation of butylene gases. The butadiene product was stored in large aboveground spherical tanks on the plantor.

The copolymer plantor was located in the northwestern portion of the plant. Rubber was produced at the plantor in three parallel production lines, where styrene and butadiene were combined (polymerized) in reactor vessels. Carbon black was used to stain the rubber and increase its durability. The final product was stored in packaged bales on pallets pending off-site shipment.

Raw materials for the rubber plant were received via surface transport (truck and rail) and pipelines, and were stored along with produced chemicals in aboveground tanks within each of the three plantors. Wastewater was treated by primary treatment systems within each plantor and by a common secondary neutralization and treatment system in the butadiene plantor prior to discharge to the sanitary sewer or the Dominguez Channel. Waste disposal pits in the southern portion of the styrene plantor (Waste Pits Area) were also used during a portion of the rubber plant's operational period. The Waste Pits Area included four evaporation ponds for aqueous waste streams and six waste pits for viscous process wastes from the styrene plantor.

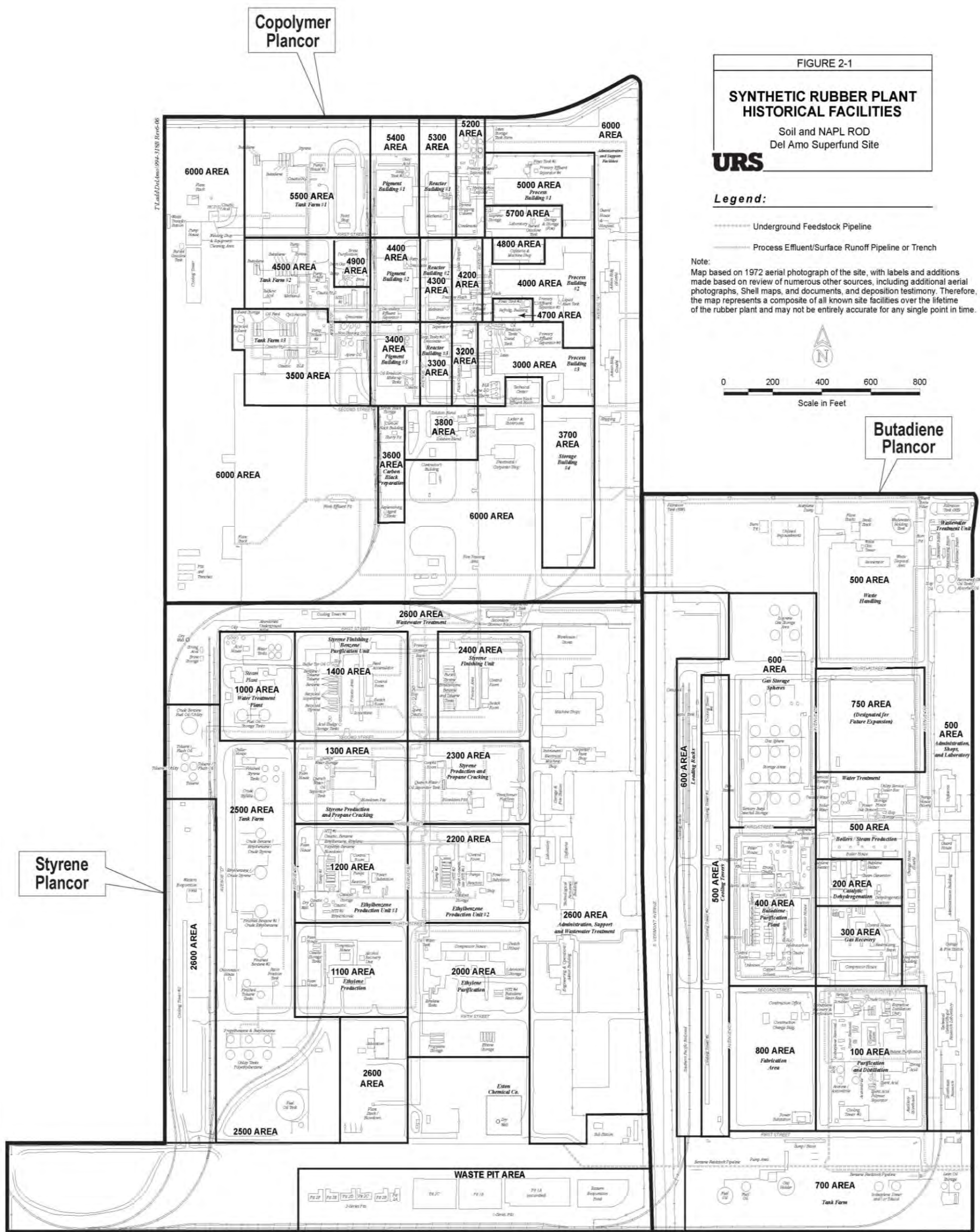
#### Areas with Releases

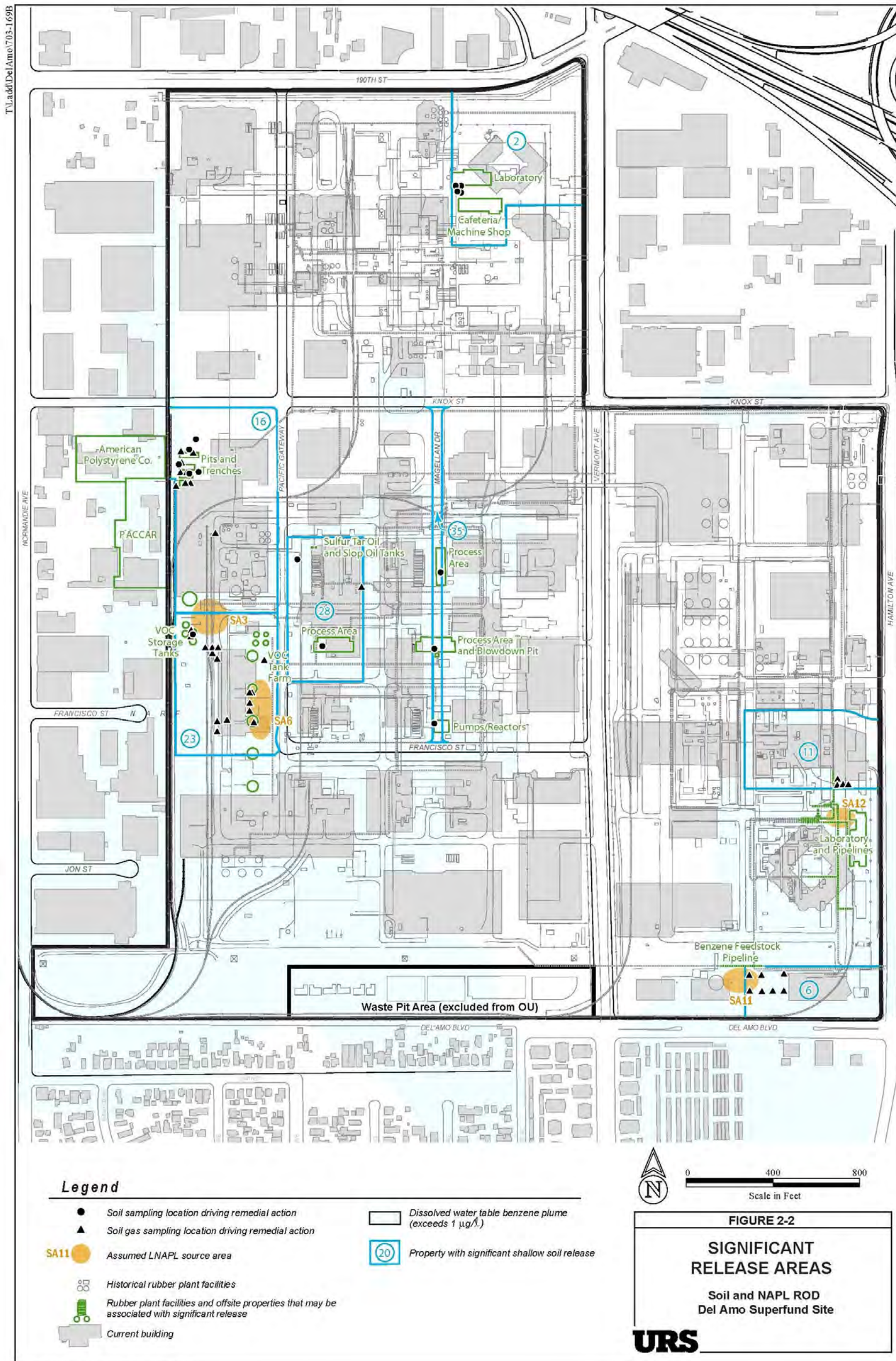
Plant site investigations focused on former locations where volatile organic compounds (VOC) and polycyclic aromatic hydrocarbons (PAH) were known to have been stored, transported, or used, as determined from facility records, maps, and photographs. Releases of hazardous substances into the environment occurred throughout the plant site to varying degrees. Areas of significant releases are shown in Figure 2-2 and are listed in Table 2-1 and described in more detail below.

**TABLE 2-1: Significant Release Areas**

Plancor	Former Plant Area	Current Parcel Number
Styrene Plancor	Tank Farm	7351-034-015
		7351-034-050
		7351-034-056
		7351-034-057
	Styrene and Ethylbenzene Production Facilities	7351-034-069
		Magellan Drive
Butadiene Plancor	Laboratory	7351-033-034
		7351-033-017
		Hamilton Avenue
	Benzene Pipeline	7351-033-022
		7351-033-027
		7351-033-900
Copolymer Plancor	Rubber Production Facility	7351-031-020
	Pits and Trenches	7351-034-015

- **Tank farm area**, former styrene plancor (western end). VOC feedstock solutions including benzene, toluene, ethylbenzene, and styrene were stored in large aboveground tanks in this area.
- **Styrene and ethylbenzene production facilities area**, former styrene plancor (middle). Styrene production and propane cracking, styrene finishing, ethylbenzene production, benzene purification, and associated facilities were located in this area. Historical documents indicate that in addition to the chemicals listed above, the following were also used in the production of styrene and ethylbenzene, although the location of their storage facilities is unknown: hydrochloric acid, sulfuric acid, ethylchloride, aluminum chloride, iron-oxide catalyst, and tertiary butyl catechol. Byproducts of the styrene finishing process may have included heavy oils, tar, and coke. These wastes were disposed of in the Waste Pits Area or recycled and used as boiler fuel.
- **Laboratory area**, former butadiene plancor (southeast area). The former plant laboratory in this area appears to be the nearest facility to the source of a significant release in this area. Benzene, toluene, ethylbenzene, and styrene were used at the laboratory. Xylenes have been detected in association with benzene and other plant-related VOCs, in the vicinity of this laboratory. Due to their chemical similarity, xylenes may also have been present as impurities within benzene and/or ethylbenzene supplies. Based on these physical and chemical associations, xylenes are included as site-related chemicals of concern (COC).
- **Benzene pipeline area**, former butadiene plancor (southern end, middle). Benzene was transported across the southern portion of the butadiene plancor in an underground pipeline. Leaks from this pipeline caused the contamination found in this area.
- **Rubber production facility area**, former copolymer plancor (northeast area). Areas with elevated concentrations of PAHs are located in the vicinity of the copolymer plancor laboratory and machine shop.





SCO:85217.PR.01 Fig.2-2 significant\_release\_area.ar 7/11

- **Pits and trenches area**, former copolymer plant (southwest corner). The area of elevated n-nitrosodiphenylamine (NDPA) and dichlorodiphenyltrichloroethane (DDT) concentrations is limited to the southwestern corner of the former copolymer plant. Analysis of historical aerial photographs indicated that there appeared to be a series of excavations resembling pits and trenches in this area. NDPA is known to be used in rubber production. DDT is not known to be associated with rubber production or any rubber plant facilities. This area partially overlaps with a stained area that is apparent on historical aerial photographs taken during the operational period.

### 2.3 Regulatory Agency Involvement

Regulatory agency involvement at the former plant site began in 1982, when a portion of the Waste Pits Area was excavated under the direction of the State of California, Department of Health Services (DHS; predecessor to the Department of Toxic Substances Control).

#### National Priorities List

In July 1991, EPA proposed the Del Amo Site be added to the National Priorities List (NPL). Shortly thereafter, DHS transferred primary regulatory responsibility for the site to EPA. In June 1996, EPA re-proposed the Del Amo Site with updated technical information after having completed the first phase of the RI. The site was added to the NPL on September 25, 1997. EPA was subsequently sued by the Harbor Gateway Commercial Property Owners' Association to have the site removed from the NPL on the grounds that EPA did not obtain the required written authorization from the governor, among other things. The court ruled in favor of the plaintiff on February 19, 1999, ruling that the listing was invalid because EPA did not obtain the written authorization from the governor. EPA then proceeded to re-propose the site to the NPL and eventually listed it on the NPL once again on September 7, 2002.

#### Administrative Order on Consent for Investigations and Studies

On May 7, 1992, EPA and DHS entered into an Administrative Order on Consent (AOC; EPA Docket No. 92-13) with Shell and Dow Chemical Company ("Dow"), to perform a remedial investigation/feasibility study (RI/FS) for the entire 280-acre former plant site and an accelerated RI/FS for the Waste Pits Area. The investigation activities started as a site-wide effort.

The RI was conducted in two phases. Phase 1 occurred between 1992 and 1995. In 1995, EPA divided the site into three OUs. The three OUs created were: OU-1 – Soil and NAPL, OU-2 – Waste Pits Area, and OU-3 – Dual Site Groundwater. Phase 2 for the Soil and NAPL OU occurred from 1995 to 2004. Investigatory activities were concluded and the final RI report was approved on July 2, 2007 (URS, 2007). Post-RI supplemental investigations were conducted in 2009 and 2010. The approach used in the investigation is discussed in Section 2.4 and the results of the investigation are described in Section 5.0.

The Risk Assessment for the Soil and NAPL OU was started in 1999, when it was believed that sufficient investigatory data were available to successfully prepare the assessment. After the available data were analyzed, however, EPA and DTSC concluded that additional field investigations were needed to successfully prepare the risk assessment. The additional sampling was conducted in 2003 and 2004, and was incorporated into the risk assessment. The risk assessment was completed in 2006.

Feasibility Study activities were initiated in 2003 and concluded in 2010.

During EPA's preparation of the Proposed Plan for the Soil and NAPL OU, two additional field investigatory efforts were undertaken to address uncertainties that were identified during Proposed Plan preparation. The first investigatory effort, a sub-slab sampling effort targeting five buildings, was conducted in February 2009. The second effort, an investigation of the extent of NAPL in four areas, was

conducted from July 2009 to May 2010. The findings from these two final investigatory efforts were incorporated into the Administrative Record for the Proposed Plan, issued in June 2010.

### **History Related to Dual Site Groundwater OU (OU-3)**

The investigation of the neighboring Montrose Chemical Superfund Site (Montrose) identified extensive Del Amo Site-related groundwater contamination. In late 1995, the Del Amo Site groundwater investigation determined that the groundwater contamination from the Montrose and Del Amo sites was co-mingled and that a single FS was needed to address groundwater for the two sites. The Groundwater RI report was completed for the Del Amo Site in 1998. EPA issued the Proposed Plan for the Dual Site Groundwater OU (EPA, 1999a) in June 1998. The ROD for the Dual site Groundwater OU (EPA, 1999b), issued in March 1999, includes a technically impracticability waiver, pumping and treatment the chlorobenzene plume associated with the Montrose Site to achieve maximum contaminant level (MCL) limits, and monitored natural attenuation for the benzene plume associated with the Del Amo Site. The ROD deferred the decision regarding NAPL remediation to the Soil and NAPL OU for the Del Amo Site and for dense non-aqueous phase liquid (DNAPL) at the Montrose Site.

PRPs for both sites have been performing the remedial design (RD) for OU-3 pursuant to Unilateral Administrative Orders issued by EPA. EPA has issued special notice to several potentially responsible parties to conduct the remedial action.

### **2.4 Institutional Controls Pilot Program**

The Del Amo Site has already been redeveloped for commercial uses. Most of the redevelopment occurred prior to initiation of the Superfund RI. Commercial activities including construction projects occur regularly. Consequently, it became clear during the FS process that institutional controls (ICs) would likely play a key role in the remedy selected for the site. In 2007, EPA initiated a pilot program of an IC known as the "Building Permit Review" IC. The objective of this pilot program was to involve the Superfund team (EPA, DTSC, and the AOC Respondents) in the City of Los Angeles' (the City) existing building permit process to work with permit applicants prior to initiation of any construction projects. The pilot nature of this program enabled EPA to immediately implement a system of interacting with the City departments and permit applicants, evaluate and adjust protocols, and utilize the experience when evaluating the implementability of this IC in the FS.

In addition to referrals from the City's building permit department, the AOC Respondents contracted the services of a "land-watch" company called Terradex. Terradex "watches" the Del Amo Site parcels for permit activity or Underground Service Alert information and passes along any relevant information to the AOC Respondents.

### **Remedial Actions/Environmental Reviews.**

Remedial actions and/or environmental reviews associated with development activities have occurred on multiple site properties during the course of site investigations. Some of these projects occurred prior to formal implementation of the building permit review IC pilot program but nonetheless, were completed under an environmental review process overseen by EPA. EPA environmental reviews / remedial actions have been completed at the following properties:

<b><u>Assessor's Parcel Number</u></b>	<b><u>Address</u></b>
7351-031-031	1000 W. 190th Street
7351-034-069	19780 Pacific Gateway
7351-034-058	1000 Francisco Street
7351-033-017	20101 Hamilton Avenue

## PART II DECISION SUMMARY

## SECTION 2.0: SITE HISTORY AND ENFORCEMENT ACTIONS

7351-031-027, -028, -029  
7351-034-052

970 and 990 W. 190th Street  
1011 Francisco Street

The nature of the development projects and the scope of the environmental reviews and remedial actions are summarized in Table 2-2.

**TABLE 2-2: Summary of Response Actions During Development Activities**

APN	Year	Project Description	Characterization	Remedial Action Completed
7351-031-031	1997-2000	Construction of new building on previously vacant parcel	Test pits and soil sampling by owner; analyses for total petroleum hydrocarbons (TPH), VOCs, semivolatile organic compounds (SVOCs), metals, polychlorinated biphenyl (PCBs)	Excavation, transportation and disposal of VOC and PCB-impacted soil by owner prior to regrading of property and construction of new building
7351-034-069	2005-06	Excavation/Construction of loading dock	Soil sampling by Respondents; analyses for VOCs, mercaptans.	Excavation, transportation, and disposal of odiferous soil by Respondents. Analytical testing did not indicate elevated levels of any VOCs or mercaptans. Excavation backfilled with clean soil prior to continuation of construction.
7351-034-058	2005-06	Expansion of existing building and excavation/construction of loading dock	Soil sampling by owners and Respondents; analyses for VOCs	Excavation, transportation and disposal of odiferous and VOC-impacted soil by Respondents; backfill with clean soil prior to construction
7351-033-017	2008	Construction/installation of freight elevator and utility trenches	Soil and soil vapor sampling by Respondents; analyses for TPH, VOCs, SVOCs, and metals	None; soil not impacted.
7351-031-027, -028, -029	2010	Installation of subsurface communication cable	Trench excavation completed by tenant (Herbal Life); soil testing by Respondents; analysis for TPH and VOCs	Soil not impacted but transportation and disposal by Respondents
7351-034-052	2010	Tenant (Toyota) removed hydraulic lifts upon end of lease	Soil sampling by tenant and owner; analyses for TPH and VOCs	Excavation of TPH-impacted soil by tenant; transportation and disposal by Respondents





### 3.0 Highlights of Community Participation

The community in the vicinity of the Del Amo Site has been engaged with the Del Amo and Montrose Superfund Sites for many years. As early as 1986, when DHS was conducting early site investigations at the Del Amo Waste Pits, and 1984, when EPA was involved in the neighboring Montrose Site, the public has been informed through newsletters, public meetings, and information repositories. During the period 1983 to 1993, community interest in these sites was modest. However, in 1993, community interest greatly increased as EPA conducted sampling activities and discovered contamination in residential yards along 204<sup>th</sup> Street, immediately adjacent to the Del Amo Waste Pits. At that time, a community group, the Del Amo Action Committee, was formed and became actively involved in the Superfund activities. Other groups and individuals with other interests and positions also existed in the community near the Montrose and Del Amo sites and became actively engaged in the process. This section discusses community involvement activities related to Operable Unit 1 “Soil and NAPL.”

#### 3.1 Soil and NAPL Operable Unit

Activities for the Soil and NAPL OU occurred throughout EPA’s involvement at the Del Amo Site. Early fact sheets and public meetings regarding the Waste Pits Area and 204<sup>th</sup> Street activities informed the public of investigation activities for the Soil and NAPL OU.

As the Soil and NAPL OU investigation and risk assessment were completed and the FS was underway, EPA focused outreach activities on OU-1. To inform the property owners within the business park, EPA met with owners’ representatives in a series of small group and individual meetings regarding an institutional control (IC) pilot program. EPA prepared and distributed a fact sheet to the owners regarding the pilot program.

In July 1998, EPA held a public meeting to describe the contamination and preview possible remedial action alternatives. In fall 2009, EPA met with owners, property managers, elected officials’ representatives (City Councilwoman and 2 Congresswomen), and local community groups (Neighborhood Council and Del Amo Action Committee) to familiarize them with EPA’s findings and discuss forthcoming cleanup plans.

In June 2010, EPA issued the Proposed Plan for the Soil and NAPL OU (EPA, 2010), placed the administrative record in the two information repositories, and initiated a 60-day comment period. On June 30, 2011, EPA held a public meeting to present the Proposed Plan and obtain public comments. Comments received during the public meeting and during the remainder of the comment period, which ended August 16, 2010, are included along with EPA’s response in the Responsiveness Summary section of this ROD.

#### 3.2 Community Relations Plan

A community relations plan issued in July 1985 for the neighboring Montrose Site (EPA DCN 0639-00482) was used during the early years of EPA’s involvement for the Del Amo Site. EPA issued an updated community relations plan that covered both sites in November 1996 (EPA DCN 0639-02277). On May 21, 2010, EPA updated the community relations plan (now known as a “Community Involvement Plan”) and posted it on EPA’s website. This plan is currently being reviewed by the community and will undergo further updates.

### 3.3 Information Repositories

EPA has maintained information repositories at the Torrance and Carson public libraries with hard copies and electronic copies of select documents related to the investigation and response actions for the Montrose Site and the Del Amo Site. In addition to the administrative record for OU-1, the repositories also contain the administrative record for the Waste Pits Operable Unit ROD and the Groundwater ROD.

## 4.0 Scope and Role of Operable Unit

EPA divided the site into three operable units when it became involved in 1992: (OU-1) Soil and NAPL, (OU-2) Waste Pits Area, and (OU-3) Dual Site Groundwater.

- (OU-1) Soil and NAPL – includes all soil outside the Waste Pits Area, including chemicals in NAPL form
- (OU-2) Waste Pits Area – includes the waste deposited in the waste pits as well as the surrounding impacted soil
- (OU-3) Dual-Site Groundwater – includes the groundwater contaminated by the Del Amo Site co-mingled with the contamination from the nearby Montrose Site and contamination from other neighboring facilities

Past and current actions organized in chronological order by OU are presented here. Actions selected by this ROD are described thereafter including how OU-1 fits into the overall site strategy.

### 4.1 OU-1: Soil and NAPL

- 1996-1997: Removed NAPL accumulated in groundwater monitoring well MW-3, located near the western edge of the former plant property in the area now designated as SA-3 [OU-1].
- 1999: Oversaw removal of contaminated soil by an owner during redevelopment activities of a property in the northwest corner of the former plant property, now designated as “Area 3” [OU-1].
- 2005-2006: Removed contaminated soil to facilitate renovation activities on properties in the western and southern areas, designated Area 24 and Area 28 [OU-1].
- 2008: Instituted a Building Permit Review IC as a pilot program with the City of Los Angeles Department of City Planning and Department of Building and Safety, to review construction plans involving excavation on any property within the former plant property [OU-1].
- 2010: Oversaw removal of contaminated soil by an owner during tenant changeover at a property in the southwestern area of the former plant property, designated as Area 22 [OU-1].

This ROD addresses soil outside the OU-2 Waste Pits Area, and includes capping select areas, implementation of soil vapor extraction (SVE) in shallow soil in select areas, implementation of institutional controls, implementation of SVE in the deep soil in select areas, and implementation of in-situ chemical oxidation (ISCO) in select areas. This ROD also addresses any additional site-related contamination that is encountered in the future during redevelopment or construction activities.

After this ROD, one additional remedy decision is anticipated. Two parcels of land, Areas 29 and 34, are not addressed in this ROD. These areas will be addressed in a ROD, ROD Amendment or Explanation of Significant Differences.

### 4.2 OU-2: Waste Pits Area

- 1994-1999: Removed sludge material that periodically seeped up out of the waste pits [OU-2].
- 1999: Constructed a Resource Conservation and Recovery Act (RCRA)-equivalent cap over the sludge and contaminated sediments/pond bottoms in the Waste Pits Area, including a vapor capture layer and off-gas treatment system, impermeable layers, and rainfall capture and

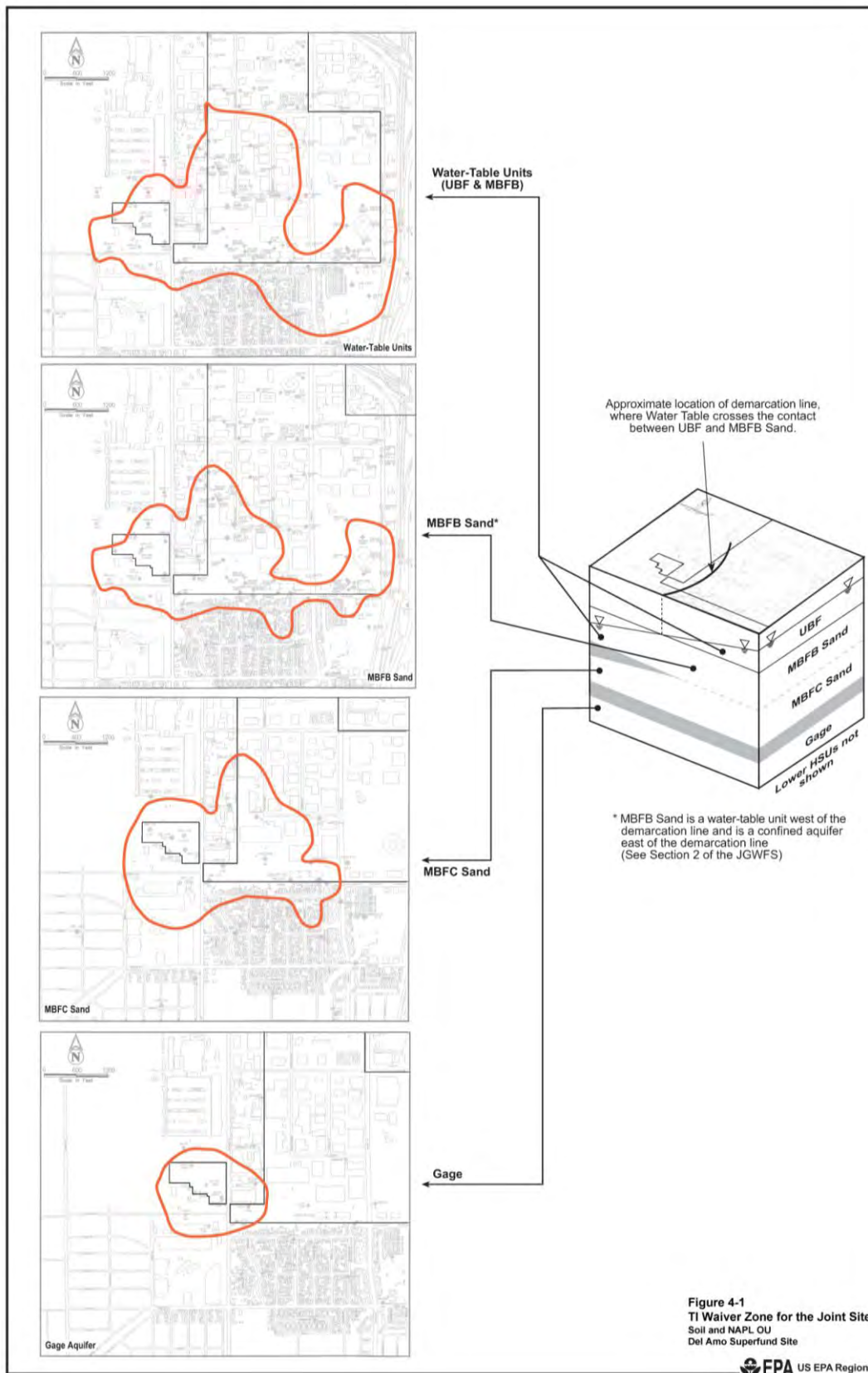
conveyance system. Along with the cap installation, installed SVE wells and associated soil vapor monitoring wells [OU-2].

- 2000 and 2005: Instituted restrictive covenants on the two parcels that constitute the Waste Pits Area [OU-2].
- 2006: Constructed the SVE extraction and treatment system at the Waste Pits Area [OU-2].

#### **4.3 OU-3: Dual Site Groundwater**

- Currently underway: design of the dual-site groundwater extraction, treatment and reinjection system [OU-3].
- Currently underway: design of the dual-site groundwater monitored natural attenuation system [OU-3].

The Soil and NAPL OU (OU-1) is related to the Dual Site Groundwater OU (OU-3) because the deep soil contamination, especially in NAPL form, is the source of contamination to the groundwater. The Groundwater ROD waived requirements to clean up groundwater to drinking water standards within a certain zone as shown in Figure 4-1. It was determined that it was technically impracticable to attain such standards due to the presence of the NAPL contamination and the state of cleanup technologies at the time. However, the Groundwater ROD specified that it was only making the first of two remedy decisions for groundwater, and that the second decision would address the NAPL remediation. This Soil and NAPL ROD will amend the previous decision made in the Groundwater ROD to add NAPL treatment, consisting of deep soil SVE and In-Situ Chemical Oxidation. In addition, this ROD selects restrictive covenants to address groundwater use. The lingering mass of NAPL, and its potential for migration, makes the long-term effectiveness of the OU-3 remedy less certain. To improve the certainty and long-term effectiveness of the OU-3 remedy, the OU-1 remedy includes NAPL treatment. However, this Soil and NAPL ROD does not modify the ARARs determinations or waiver set forth in the OU-3 ROD and does not otherwise change the remedial requirements selected for the technical impracticability zone or the downgradient groundwater plume.





## 5.0 Site Characteristics

### 5.1 Conceptual Site Model

The Conceptual Site Model (CSM) identifies potential chemical sources, release mechanisms, impacted media, transport mechanisms, exposure routes, and potential receptors. The CSM for the Del Amo Site is presented as a flow chart on Figure 5-1 and graphically on Figure 5-2 and Figures 5-3 through 5-6. The following paragraphs explain the CSM.

#### Potential Chemical Sources

The primary sources of chemicals of potential concern (COPCs) are former aboveground storage tanks, processing units, and other facilities at the former plant site, which are discussed in more detail in Section 2.2 and shown on Figure 2-1, 5-3 and 5-4, and consist of (1) aboveground storage tanks from the tank farm area of the former styrene plant, (2) styrene and ethylbenzene production facilities within the former styrene plant, (3) laboratory area of the former butadiene plant, (4) benzene pipeline area of the former butadiene plant, (5) rubber production area of the former copolymer plant, and (6) pits and trenches area of the former copolymer plant.

#### Release Mechanisms

The releases from the facilities listed above are likely to have occurred from leaks and spills from storage tanks (tank farm area of styrene plant, storage tanks in styrene/ethylbenzene production area), chemical processing units (styrene/ethylbenzene production area), and pipelines (benzene pipeline area of butadiene plant, and possibly other areas). The site historical investigation identified pits in two of the contamination areas, including "blow down pits" in the styrene/ethylbenzene production area and pits and trenches in the copolymer plant that could have been used for disposal. Storage buildings (styrene/ethylbenzene production area), laboratories (butadiene plant and copolymer plant), and a machine shop (copolymer plant) were located in areas with actionable levels of contamination; release mechanisms associated with these facilities conceivably could have been leaks, spills, or some manner of direct disposal.

#### Impacted Media

Releases from the above sources impacted underlying soil and groundwater media. For the purposes of the CSM, NAPL is considered to be part of these media.

#### Transport Mechanisms

Contamination from the impacted media is transported either into the groundwater (in the case of the deep soil contamination) or upward to surface receptors. The deep soil contamination, consisting of VOCs, is transported into the groundwater via either direct dissolution (where contamination exists in the saturated zone) or vapor diffusion (where contamination exists in the vadose zone). VOCs in either the shallow soil, deep soil, free phase or dissolved in the groundwater can be transported via diffusion to the surface into the breathing space of surface receptors. PAHs, pesticides/PCBs, and metals in the shallow soil are transported via fugitive dust emissions into the breathing space of potential receptors or through direct contact with soil.

#### Exposure Routes

The "exposure route" refers to the method by which a chemical may enter the human body. Receptors can be exposed through inhalation of soil particulates or vapor, ingestion of soil particulates or water, and dermal contact with soil or water. Soil particulates and vapors transported into the breathing space



can expose potential receptors through the inhalation route. Contaminants adsorbed onto soil that is inhaled by a receptor can also be ingested as the dust is caught in the mucus membranes and then swallowed. Contaminants dissolved in water can be swallowed. Contaminants adsorbed onto soil could contact and be absorbed into a receptor's bare skin. Similarly, such contaminants that directly contact the receptor's skin can also enter the receptor's mouth and be ingested when the receptor touches his hands to his mouth. Contaminants dissolved in water can also be absorbed into a receptor's bare skin.

### Potential Receptors

Receptors are humans, animals, or plants that are potentially exposed to the chemicals. Human receptors are the primary focus of the Baseline Risk Assessment (BRA). Biota are evaluated in an ecological risk assessment. For the purposes of the BRA, human receptors for the former plant site were divided into three types: (1) commercial workers, which includes most of the current indoor work force for the existing businesses; (2) trench workers, who would be exposed to subsurface soil; and (3) hypothetical future residents, who would potentially be present at the former plant site on a nearly continuous basis. There are currently no residents at the former plant site, and current zoning is restricted to commercial/industrial land use, but future residential risk is evaluated as a baseline and because land uses can change over time in a mixed use area such as surrounds the Del Amo Site.

### Exposure Pathways

An exposure pathway consists of the route and mechanisms by which a chemical reaches a receptor. A "complete" exposure pathway exists where a continuous link exists between the chemical source, release mechanism, transport medium, exposure route, and potential receptor(s). Complete and potentially complete exposure pathways are summarized in more detail in the Figure 5-1.

## 5.2 Topography, Geography, Hydrogeology

The former 280-acre plant site lies in the Torrance Plain, a relatively flat area within the broad coastal plain of the greater Los Angeles area (see Figure 5-7). The closest surface water body is the Dominguez Channel (see Figure 5-7), a man-made concrete drainage channel approximately 2,000 feet northeast of the former plant site. Surface water runoff is controlled by the local streets and storm drain system. The elevation ranges from 48 feet above sea level on the western edge of the former plant site to approximately 30 feet above sea level on the eastern edge.

The former plant site overlies the West Coast Groundwater Basin, a sub-basin of the Los Angeles Coastal Groundwater Basin. The near-surface deposits in the vicinity of the former plant site are part of the Lakewood Formation, which extends to a depth of approximately 200 feet below ground surface (bgs) and consists predominantly of interbedded fine sand and mud (silt and finer sediment). The Lakewood Formation is divided into the Bellflower Aquitard and the underlying Gage aquifer. The Bellflower Aquitard is further subdivided into the following hydrostratigraphic units: the Upper Bellflower Aquitard (UBF), the Middle Bellflower B Sand (MBFB), the Middle Bellflower Mud (MBFM), the Middle Bellflower C Sand (MBFC), and the Lower Bellflower Aquitard (LBF). Representative cross sections showing the interpreted positions of the various units at the former plant site are presented in Figure 5-5. For the purposes of this remedy, the soils of concern are the top 80 feet, which consist predominantly of fine sand and silt. The primary hydrostratigraphic units of concern are the UBF and MBFB, which cover the zone from the ground surface to the water table and the upper 25 feet of the saturated zone.

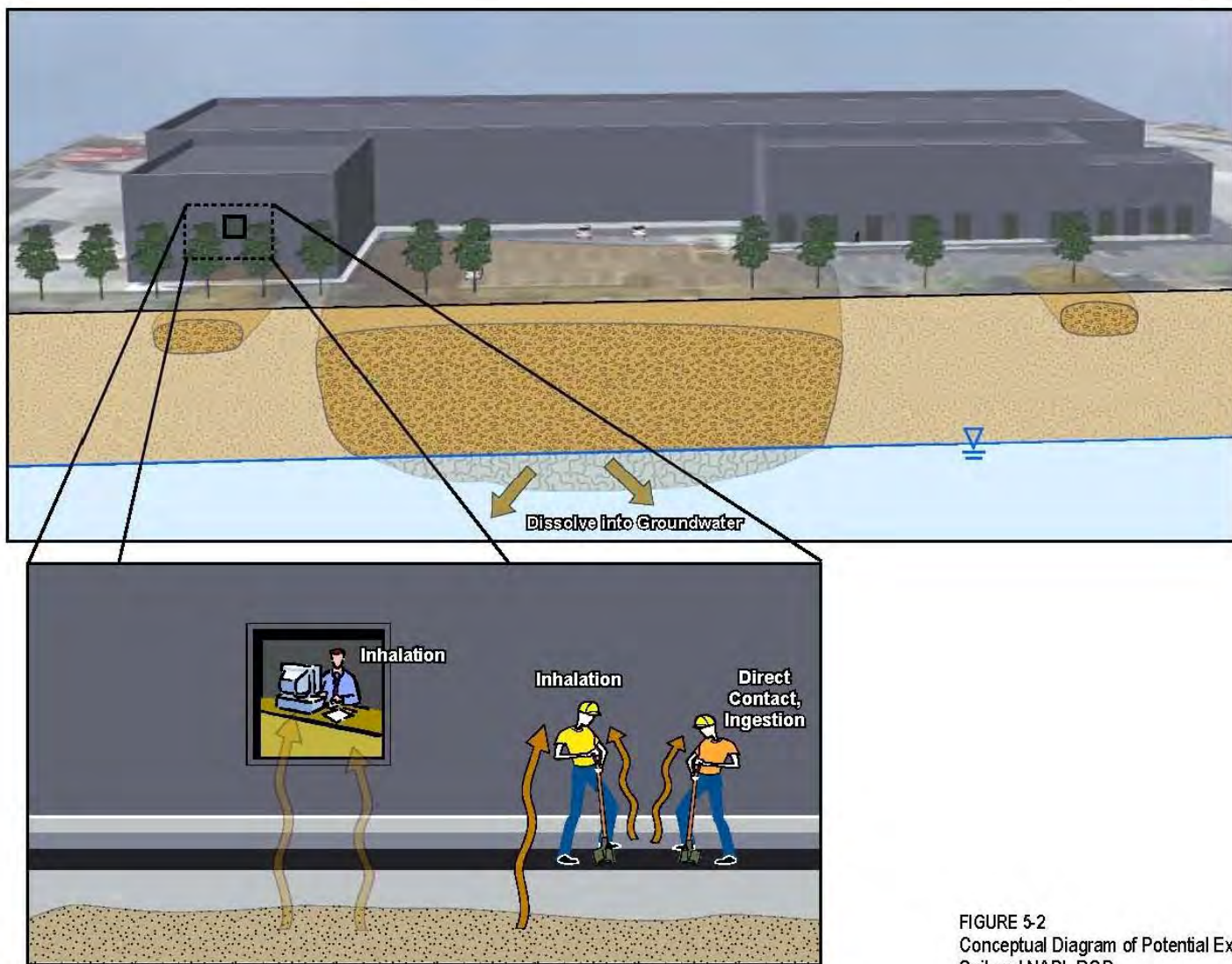
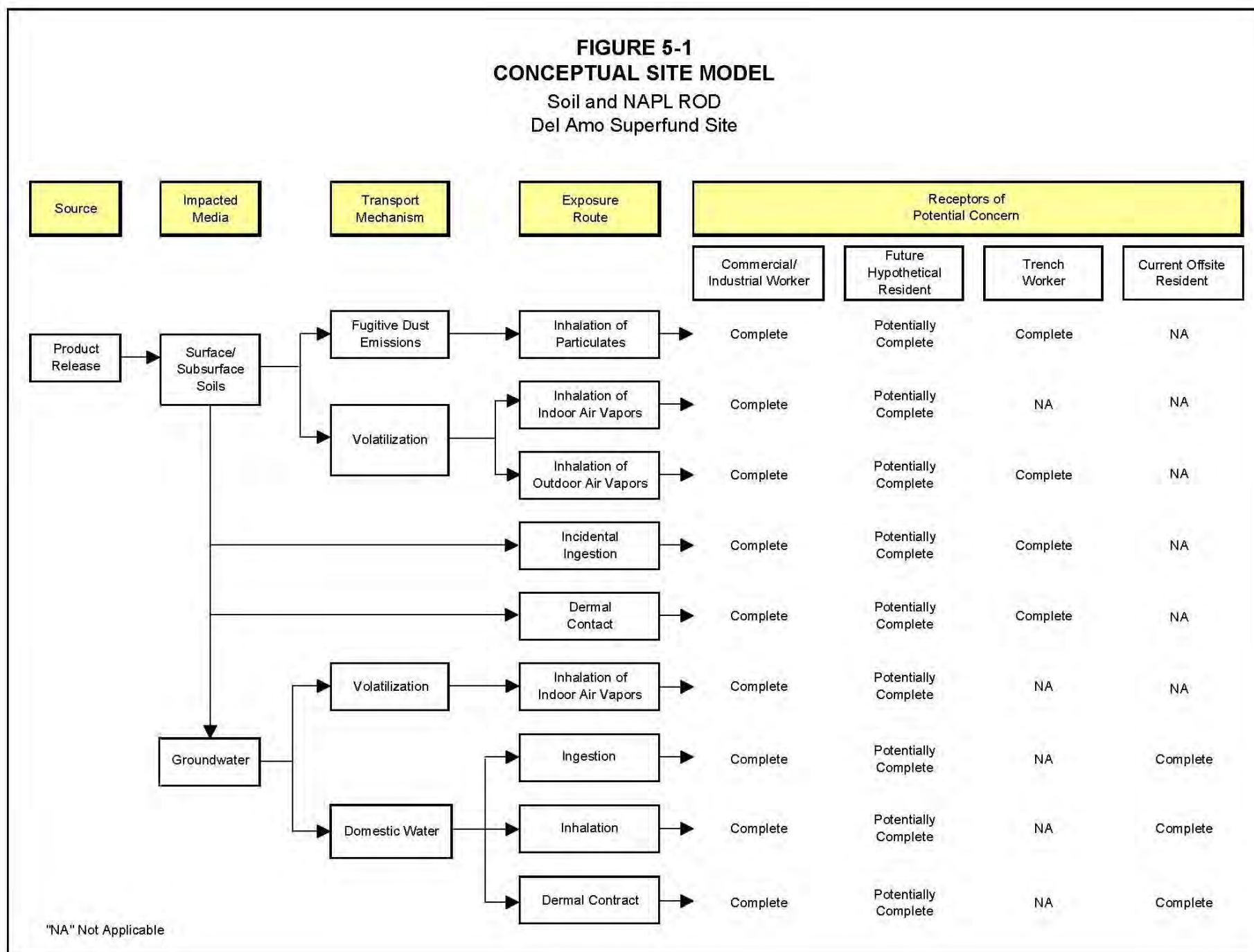
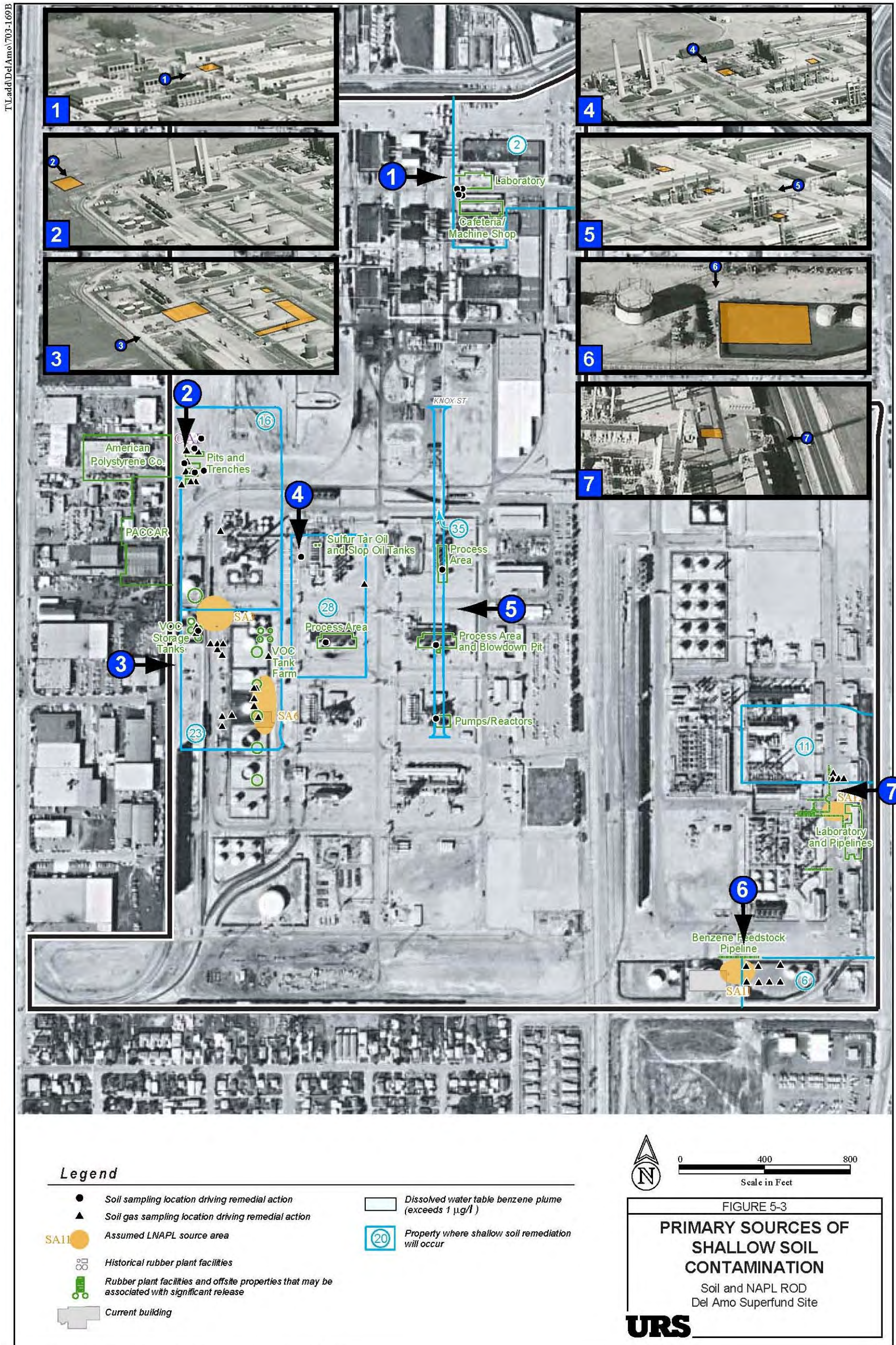


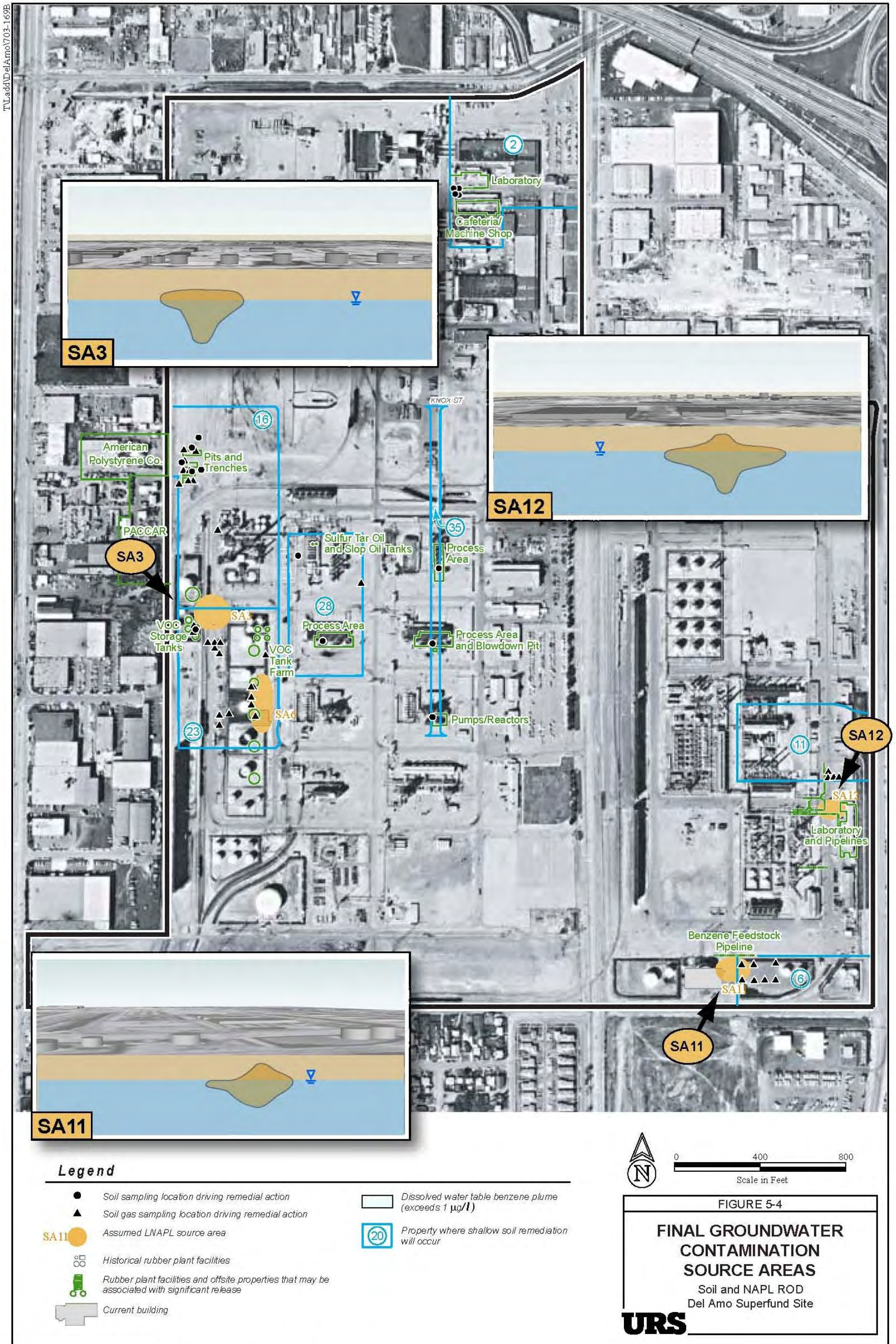
FIGURE 5-2  
Conceptual Diagram of Potential Exposure Pathways  
Soil and NAPL ROD  
Del Amo Superfund Site

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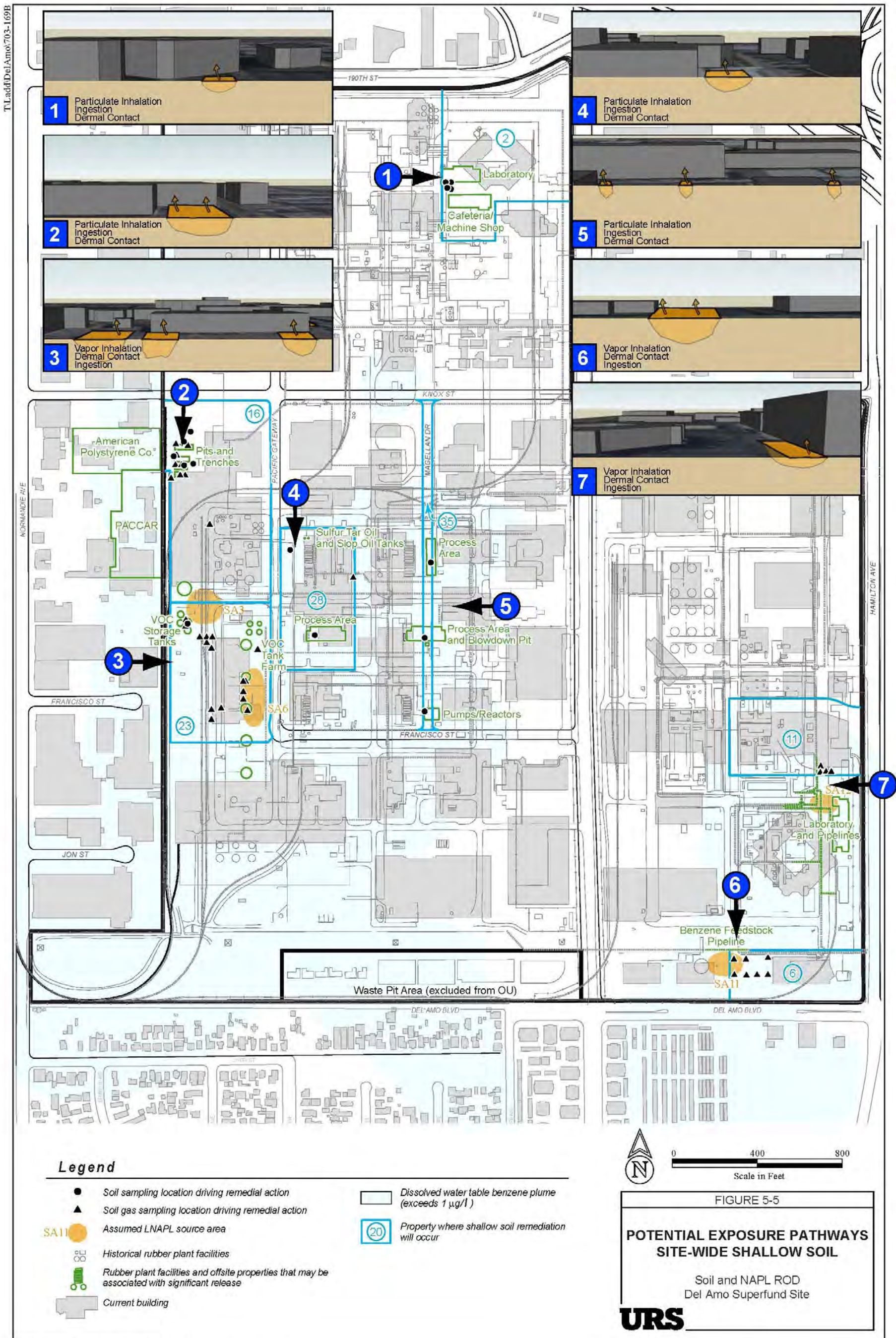
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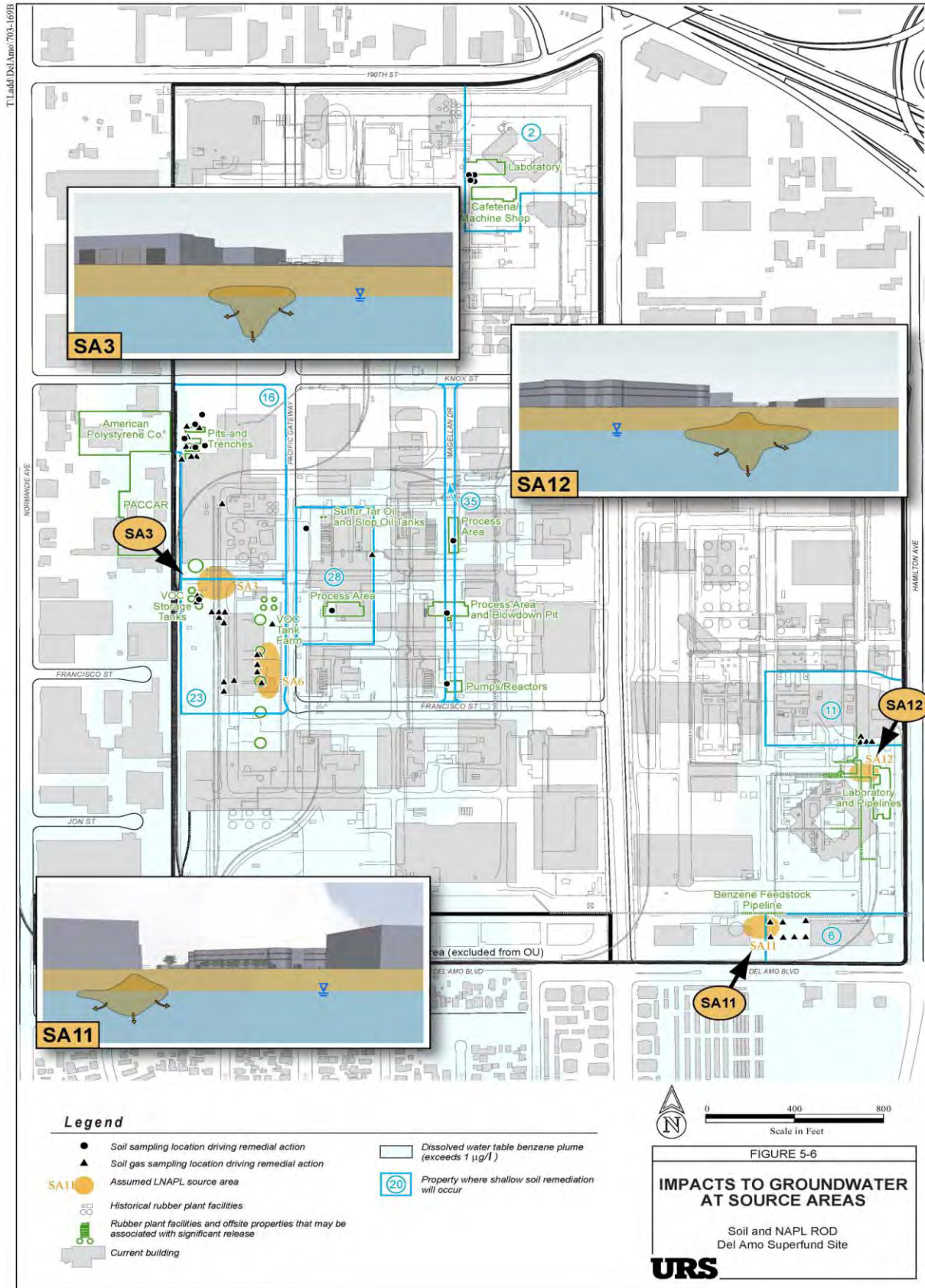
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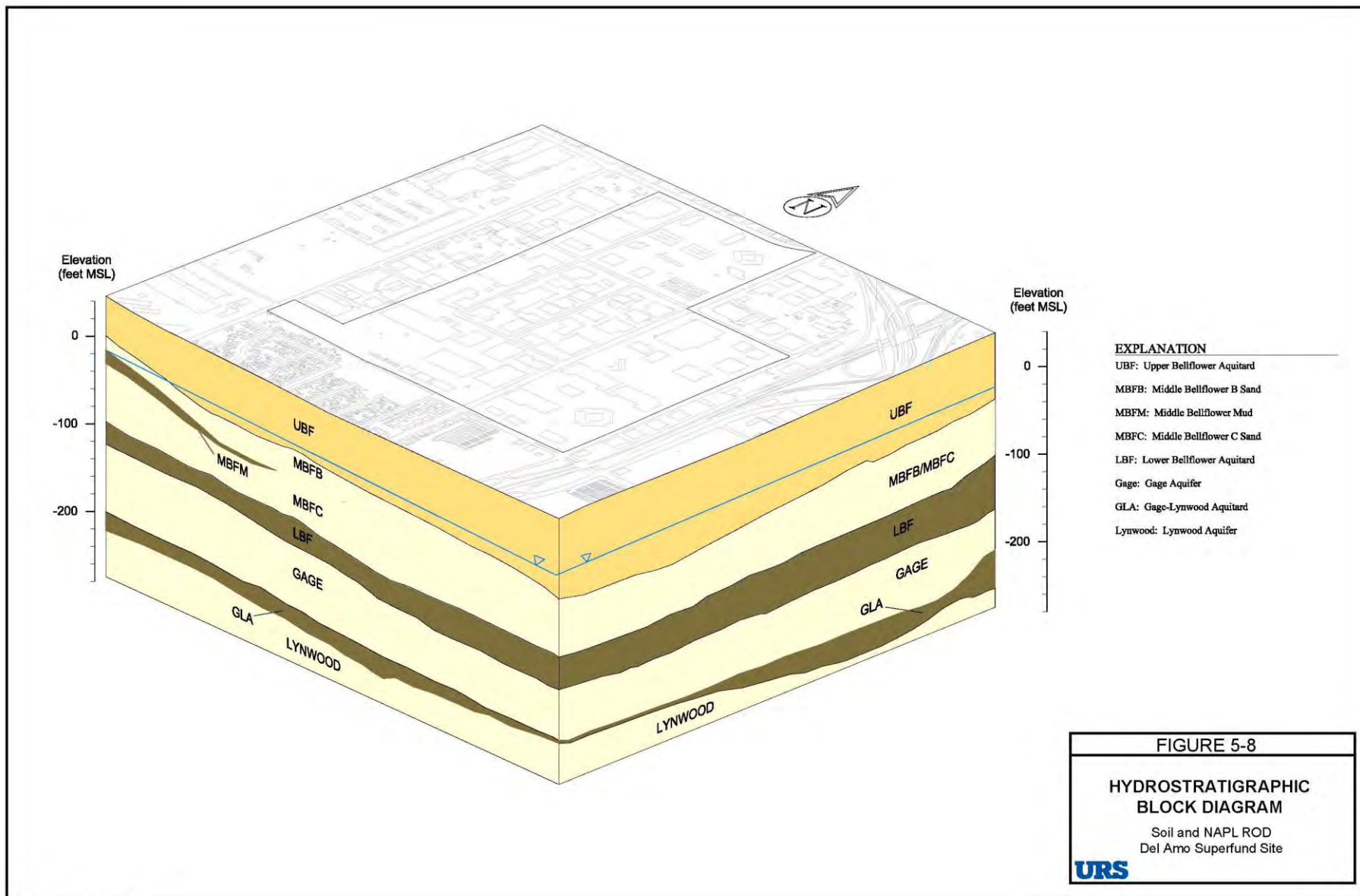
PART II DECISION SUMMARY

SECTION 5.0: SITE CHARACTERISTICS



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The groundwater table at the former plant site is present at depths ranging from 32 to 57 feet bgs, depending upon location (based on 2004 groundwater elevation data). Groundwater flow direction is generally toward the south-southwest, but a radial flow pattern associated with local groundwater mounding is inferred in the vicinity of the Waste Pits Area and near the southeast corner of the former plant site.

The groundwater table in the vicinity of the former plant site has been rising steadily for the past 30 years. The groundwater levels were more than 20 feet lower than 2004 levels for much of the former rubber plant's operational period. The rising groundwater levels have "smeared" the light non-aqueous phase liquid (LNAPL) through the upper saturated zone and introduced dissolved phase contaminants into newly saturated soils.

### 5.3 Remedial Investigation Approach, Site-Wide

Figure 5-9 shows the chronology and inter-relationships of the primary investigations and associated documents for the Del Amo Site since EPA oversight began in 1992. These investigations are described in more detail below.

#### Phase 1 Investigations

Del Amo Site RI investigations were initiated in 1992 with investigations at the "MW-20 NAPL area" in the western styrene plancor, where LNAPL was known to be present based on observations from a monitoring well installed as part of an investigation for the neighboring Montrose Site.

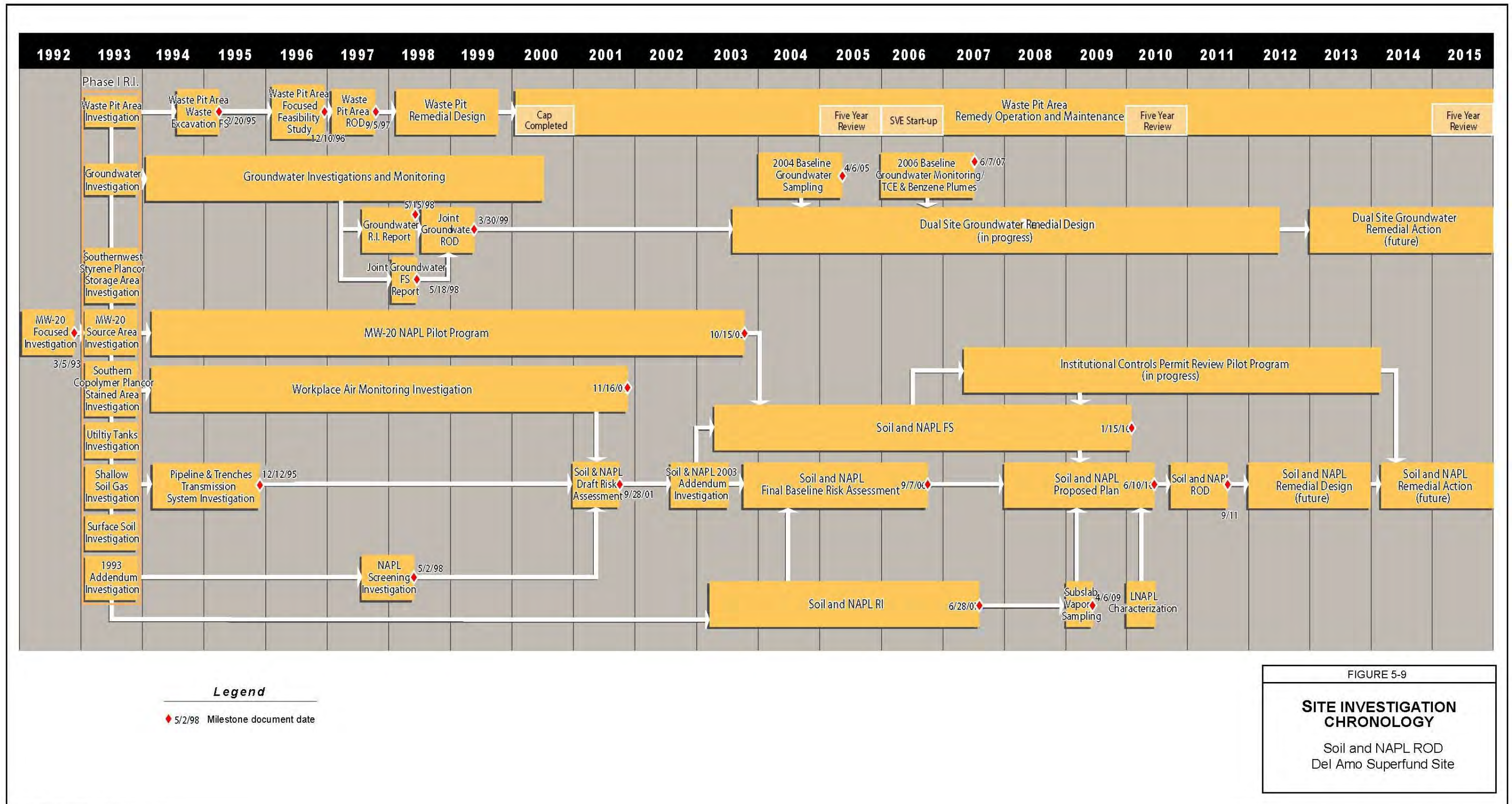
In 1993, intensive, site-wide RI characterization investigations began and included the following elements:

- MW-20 Area
- Waste Pits Area
- Groundwater site-wide
- Shallow soil gas site-wide
- Surface soil site-wide
- Southwestern styrene plancor storage area
- Southern copolymer plancor stained area
- Utility tanks
- Workplace air site-wide
- Pipelines and trenches transmission system

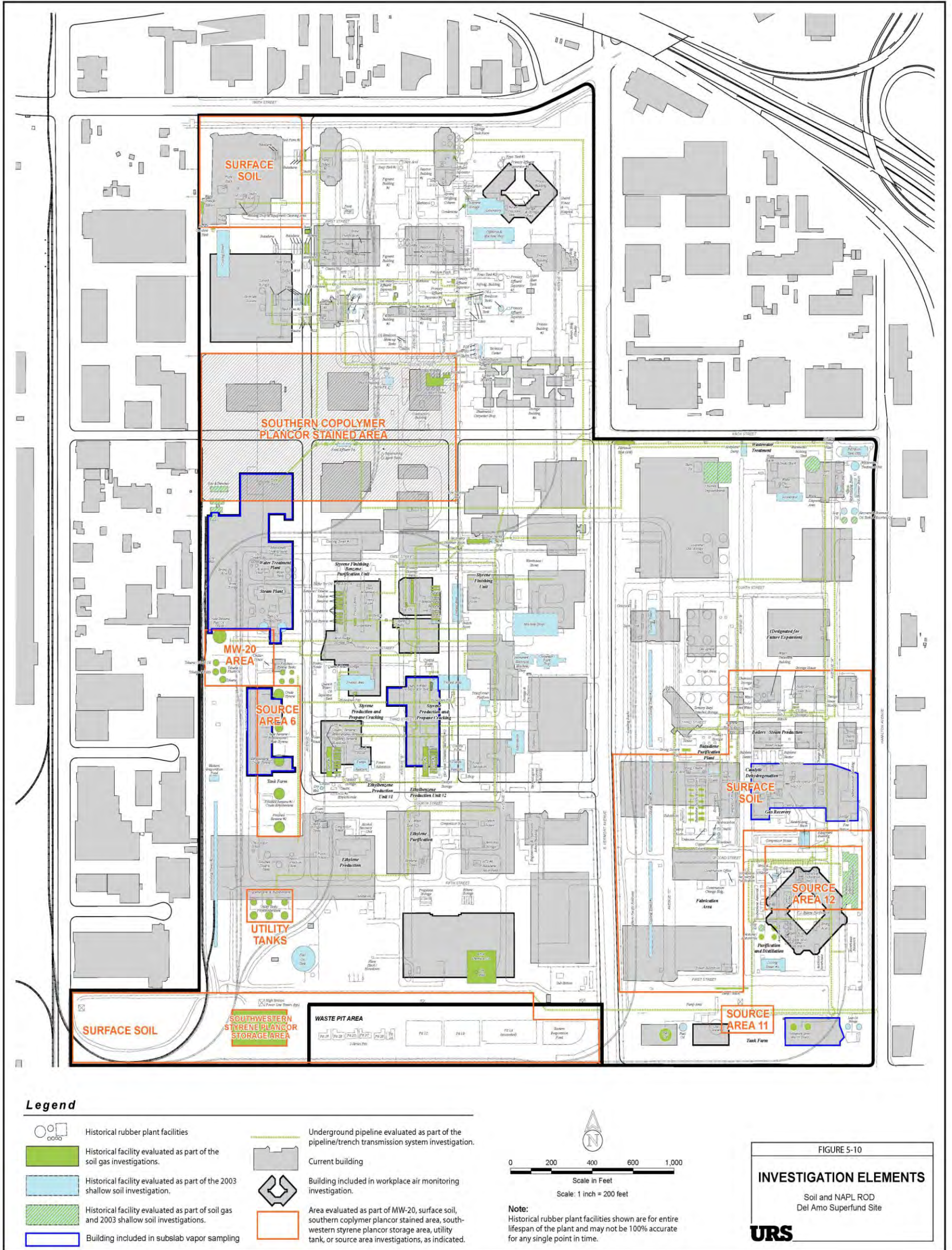
Figure 5-10 shows the locations of these investigation components. The RI characterization investigations followed a set of guiding concepts, explained below.

**Surface Exposure Pathways, NAPL, Remedial Alternatives.** The RI gathered data that would be useful for evaluating the potential exposure pathways, the extent and characteristics of NAPL, and remedial alternatives. Such data included surface and shallow soil, shallow and deep soil gas, groundwater, and workplace indoor air. Shallow soil and soil gas samples are those collected between 0 and 15 feet bgs, while deep soil and soil gas samples are those collected from depths in excess of 15 feet bgs.<sup>1</sup>

<sup>1</sup> Shallow soil was defined as the soil that would be encountered during a reasonably anticipated construction project at the type of properties found at the Del Amo Site. Based on the types of buildings found at the Site, a reasonably anticipated excavation would at the most consist of a single level basement, which would be approximately 15 feet bgs.



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**Known Contamination or Likely Locations.** Data were collected in areas where historical information, including layout, operations and facility types, indicated a potential for chemical releases. The historic plant layout had multiple areas of densely packed chemical storage and processing areas separated by large areas of open space, parking or administration facilities. Since demolition of the plant in the early 1970s, the majority of the former plant site had been redeveloped with closely spaced commercial and industrial buildings. These factors resulted in RI sampling locations being concentrated in accessible areas where the potential for contamination was judged to be highest, including former facility locations where chemicals were stored, used, transported, or disposed of. A map was produced superimposing historical plant facilities (as known from plant maps and documents, historical aerial photographs, deposition testimony, and technical papers) and current surface features (such as buildings and roads) that provided the basis for initial sampling locations.

**Beneath Buildings.** Although the location of former rubber plant facilities was well documented, many of the facilities of interest were found to lie partially or entirely within the footprint of existing, active business buildings. Due to the difficulty in accessing these areas and the associated disruption to the businesses, subsurface sampling beneath existing buildings was avoided. Where contamination was suspected to underlie a building, sampling was completed immediately adjacent to the building, within the water table, and the building was targeted for follow-up indoor air monitoring.

**Target Analytes.** Samples were analyzed for a broad spectrum of chemicals of potential concern (COPCs), as indicated below:

<u>Soil Gas</u>	<u>Soil</u>	<u>Indoor Air</u>	<u>Groundwater</u>
VOCs	VOCs	VOCs	VOCs
	SVOCs		SVOCs
	PAHs		Metals
	Metals		Pesticides/PCBs
	Pesticides / PCB		Parachlorobenzene sulfonic acid (pCBSA)
	Cyanide		

Early analytical data for the various sampling media indicated that elevated levels of VOCs, particularly benzene, were distributed across the greatest area and at the highest concentrations of all the chemicals. Given this finding and the relative toxicity of benzene and related compounds, VOCs were judged to be the primary risk-driving compounds and COCs. Therefore, the RI initially focused on former plant site facility locations where VOCs were known to have been stored, transported, or used in process areas.

**Top-Down/Bottom-Up Approach.** Multiple lines of evidence were gathered to identify and evaluate areas where past releases may have contributed to soil and groundwater contamination. The search for such areas proceeded in both a “top-down” and “bottom-up” approach. The top-down component started with the historical rubber plant documentation mentioned earlier, which led to focusing the shallow soil and soil gas sampling where former process units, pipelines, chemical storage and disposal areas had been located. Where elevated chemical concentrations were detected in soil, additional step-out sampling was conducted in the soil and downgradient sampling was conducted in the groundwater. The bottom-up component started with an independent water table plume delineation investigation that included sampling along multiple transects and at critical portions of the former plant site perimeter. Where elevated contaminant concentrations were detected in groundwater, additional groundwater sampling was conducted upgradient, and soil or soil gas sampling was conducted in areas that could be the sources for the groundwater contamination. Using this combined top-down and

bottom-up approach, groundwater contamination source areas and potential NAPL areas were identified.

### Phase 2 Investigations

After the initial investigation phase, the investigation was divided into separate efforts for the individual OUs. The second phase of the Soil and NAPL OU(OU-1) investigation is described below.

**MW-20 Pilot Program.** Phase 1 investigations of the NAPL in the MW-20 area led to a pilot test of hydraulic extraction at that location. Known as the MW-20 Pilot Program, work involved installation and operation of a closely spaced array of extraction and monitoring wells over a period of approximately 7 months. During the pilot program, 1.2 million gallons of impacted groundwater and 35 gallons of separate-phase benzene NAPL were extracted. The efficacy of hydraulic extraction as a NAPL removal technology was then evaluated.

**Source Area Investigation.** A Source Area investigation was completed in 1997–98, wherein the potential presence, nature, and mode of occurrence of NAPL were evaluated at groundwater contamination source areas 6, 11, and 12 (SA-6, SA-11, and SA-12). LNAPL characterization was completed through use of the Rapid Optical Screening Tool (ROST), analytical testing of soil and groundwater samples, and observational techniques.

**2003 Shallow Soil Investigation.** In 2001, a draft Baseline Risk Assessment (BRA) for the Soil and NAPL OU was completed. Review of the BRA indicated a concern that data, particularly for PAHs, represented a data gap. As a result, a 2003 shallow soil investigation<sup>2</sup> for the Soil and NAPL RI focused on facilities where the potential presence of PAHs was greatest, although analyses for VOCs, metals, and pesticides were also completed at selected locations.

**Sub-slab Vapor Sampling.** After the risk assessment was completed, potential soil vapor concerns were identified at five properties (listed below). The risk assessment was based on soil and soil gas data from outside the buildings and modeling potential for migration of soil gas into the buildings. These properties included the following:

<u>Assessor's Parcel Number</u>	<u>Address</u>
7351-033-022	20221 South Hamilton Avenue
7351-033-034	19901 South Hamilton Avenue
7351-034-015/050/056	19681 Pacific Gateway Drive
7351-034-045	19831 Magellan Drive
7351-034-057	19899 Pacific Gateway Drive

In order to further evaluate the potential for soil vapor intrusion at these properties for use in the remedy decision-making process, post-RI sampling of the soil gas was performed beneath the concrete foundation slabs. Sub-slab vapor samples were collected at each of the properties in 2009. Although the sub-slab vapor investigation was completed after the RI had been finalized, the information has been incorporated into the administrative record for this ROD.

**LNAPL Characterization.** In 2010, a post-RI LNAPL investigation was performed for four groundwater contamination source areas: SA-3, SA-6, SA-11, and SA-12. The investigation involved completing multiple Ultraviolet Optical Screening Tool (UVOST) incursions at each of the groundwater contamination source areas. Limited additional soil borings were also obtained.

<sup>2</sup> The 2003 Shallow Soil Investigation was known as the "2003 Addendum Investigation" in the administrative record.

#### 5.4 Known or Suspected Sources of Contamination

As described in Section 2.0, Site History and Enforcement Actions, the former rubber plant used benzene, propane, butylene, and butane (and lesser amounts of other chemicals) to create synthetic rubber. Figure 5-6 shows the layout of the historical facilities at the former plant. During plant operations, chemicals were released into the environment, contaminating the soil and groundwater beneath the plant. Chemical releases occurred from many of the varied processes, pipelines, and tanks located at the former plant site. Section 2.2 discusses the following six areas of the plant that appear to be associated with the most significant releases:

- Tank farm area (styrene plancor)
- Styrene and ethylbenzene production facilities (styrene plancor)
- Laboratory area (butadiene plancor)
- Benzene pipeline area (butadiene plancor)
- Rubber production area (copolymer plancor)
- Pits and trenches area (copolymer plancor)

Section 2.2 describes the activities that occurred in each of these areas during operation of the former rubber plant, including the types of chemicals used and the activities conducted (chemical storage, transportation, processing, etc.). The characteristics of these areas, including types of contamination found, affected media, and chemical concentrations, are discussed below.

#### 5.5 Types of Contamination and Affected Media

The remedial investigation found varying types and amounts of chemicals throughout the former plant site. The dominant type of chemical found site-wide was VOCs, mainly benzene. Lesser amounts of PAHS, pesticides/PCBs, and metals were also found. Table 5-1 summarizes the specific chemicals within these groups that were found during the investigation and that warranted further risk evaluation. Table 5-1 also identifies where the chemicals were found (in shallow soil, deep soil, or groundwater). Chemical releases contaminated the shallow soil (top 15 feet) in some locations and the deep soil (down to 80 feet) in other locations.

##### Deep Soil

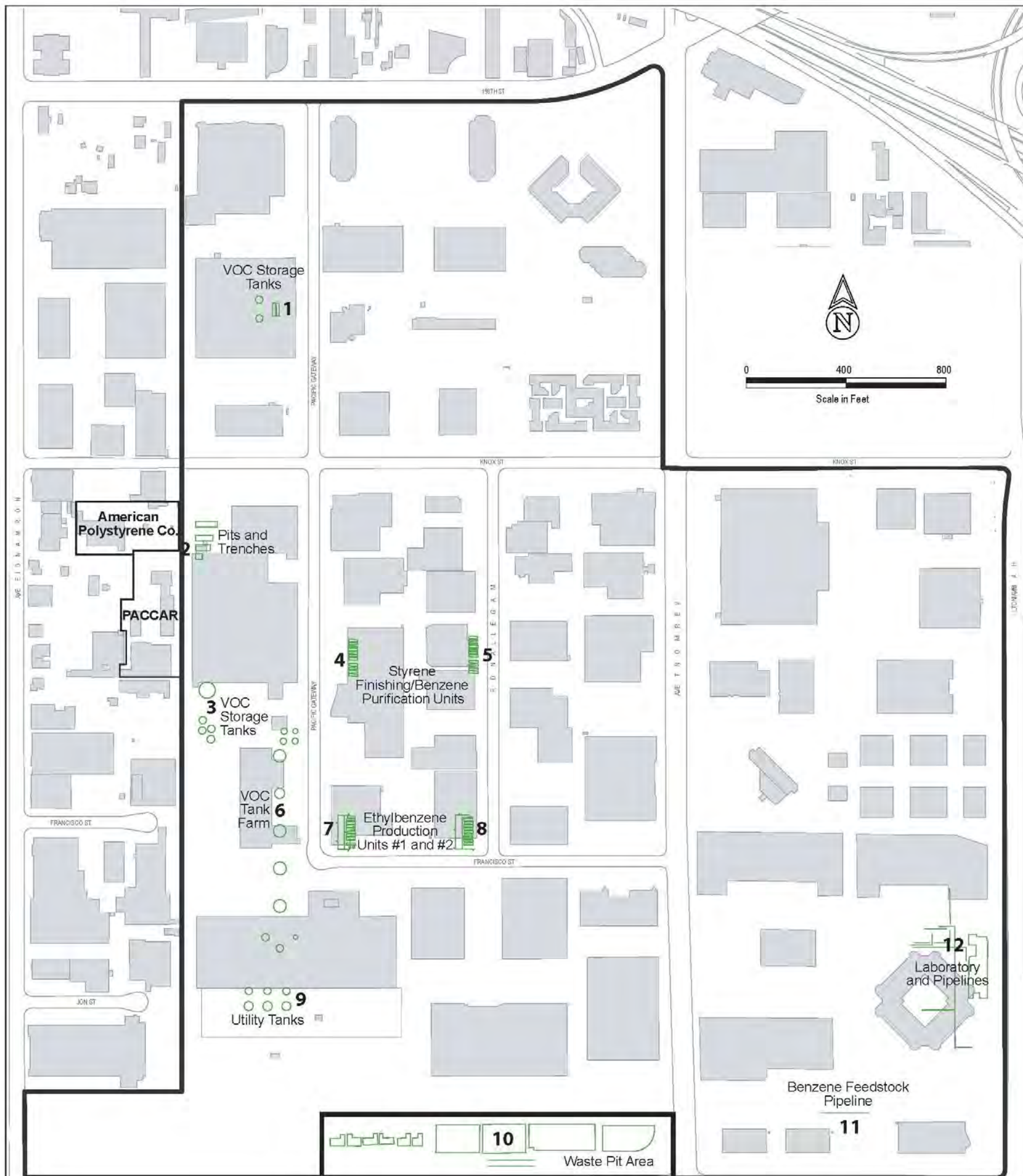
The contamination that reached the deep soil was in NAPL form, which contaminated the groundwater. The 12 areas where contamination likely entered the groundwater were called "groundwater contamination source areas ("SA")." Of the 12 groundwater contamination source areas, nine were determined to be significant enough to be evaluated in the feasibility study for possible cleanup, and subsequently four are deemed to warrant remedial action. Figure 5-11 shows the locations of the 12 groundwater contamination source areas. Figure 5-12 shows the locations of the four source areas warranting remedial action, indicated in yellow on the figure, and designated "SA" plus a number.

**TABLE 5-1: Chemicals of Concern**

Chemical Name		Shallow Soil (0-15 feet bgs)	Deep Soil (>15 feet bgs)	Groundwater
VOCs	Benzene	x	x	x
	Ethylbenzene	x	x	x
	Toluene	x	x	x
	Xylene	x	x	x
	Styrene	x	x	x
	TPH (C6-C10)	x	x	x
	Trichloroethene (TCE)	x	--	--
	Tetrachloroethene (PCE)	x	--	--
	1,2,4-trimethylbenzene	x	--	--
	Cyclohexane	x	--	--
	Isopropylbenzene	x	--	--
	Isopropyltoluene	x	--	--
PAHs	Benzo(a)pyrene	x	--	--
	Benzo(a)anthracene	x	--	--
	Benzo(b)fluoranthene	x	--	--
	Benzo(k)fluoranthene	x	--	--
	Indeno(1,2,3-c,d)pyrene	x	--	--
Metals	Arsenic	x	--	--
	Copper	x	--	--
Other	TPH (C11-C23)	x	x	x
	4,4-DDT	x	--	--
	N-Nitrosodiphenylamine	x	--	--

Contaminants from off-site sources also have impacted groundwater beneath the Del Amo Site. Groundwater contamination from the nearby Montrose Site has co-mingled with the Del Amo Site groundwater plume. Chlorinated VOCs from other contaminated sites in the area have also contributed to Montrose and Del Amo sites groundwater contamination, as is discussed in more detail in the Dual-Site Groundwater ROD (EPA, 1999b).

The NAPL consists primarily of benzene. Benzene, in NAPL form, is lighter than water and tends to float upward in aqueous media. This is referred to as "light NAPL," or LNAPL. For the purposes of this ROD, the terms LNAPL and NAPL are used interchangeably. LNAPL was directly observed floating on the groundwater surface in two areas. NAPL was also found deeper in the soil, 25 feet below the groundwater surface, possibly indicating that it had been released into the environment when the groundwater table was lower. As a result of the upward groundwater movement in the heterogeneous sediments of the Upper Bellflower aquitard, some LNAPL was trapped underneath the water table by low-permeability formations. Thus, most of the benzene LNAPL found during the remedial investigation was in the saturated zone, beneath the water table, although some was also found in the vadose zone or floating on top of the water table.



Source Area Number	Plancor	Suspected Source Facility	Primary Contaminants	NAPL?
1	Copolymer	VOC storage tanks	Cyclohexane	Unlikely
2	Copolymer	Off-site properties to west	TCE, PCE	Potential DNAPL
3	Styrene	VOC tanks	Benzene	LNAPL accumulation
4	Styrene	Styrene finishing/benzene purification unit	Benzene, cyclohexane	Potential LNAPL
5	Styrene	Styrene finishing/benzene purification unit	BTEX, styrene	Unlikely
6	Styrene	VOC tank farm	Benzene, ethylbenzene	Residual LNAPL
7	Styrene	Ethylbenzene production units #1 and #2	Benzene, ethylbenzene	Potential LNAPL
8	Styrene	Ethylbenzene production unit #1 and #2	Benzene, ethylbenzene	Potential LNAPL
9	Styrene	Utility tanks	Benzene, toluene	Potential LNAPL
10	Styrene	Waste pit area	BTEX	Potential LNAPL
11	Butadiene	Benzene feedstock pipeline	Benzene	Residual LNAPL
12	Butadiene	Laboratory and pipelines	BTEX, styrene	LNAPL accumulation

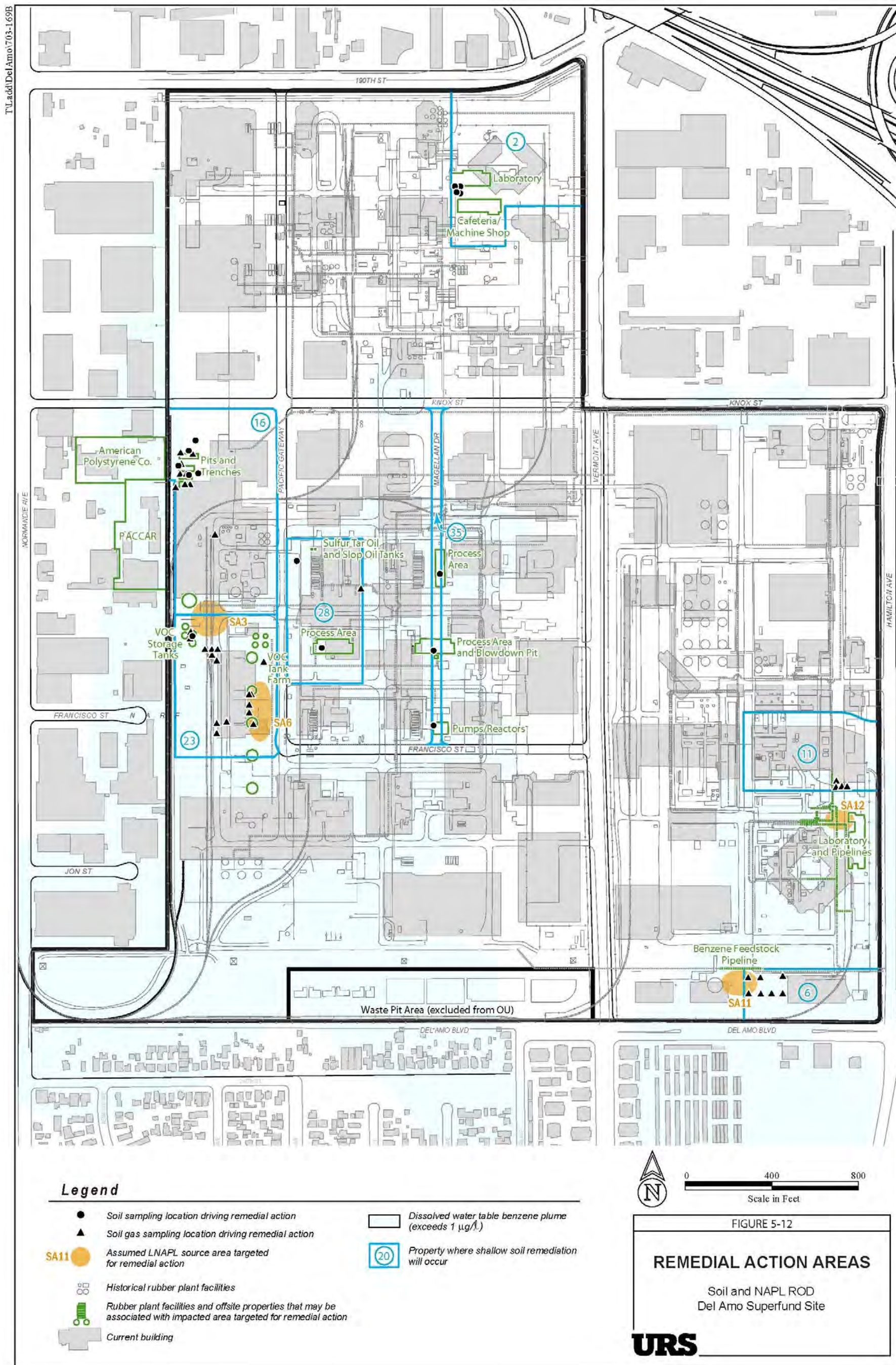
**Legend**

○ ○ ○ Historical rubber plant facilities inferred to be associated with groundwater contamination source area

FIGURE 5-11  
**INITIAL GROUNDWATER CONTAMINATION SOURCE AREAS**  
 Soil and NAPL ROD  
 Del Amo Superfund Site







### Shallow Soil

The Baseline Risk Assessment, discussed in Section 7.0, evaluated impacts from shallow soil to receptors at each parcel. Based on the risk evaluation, seven shallow soil areas warrant remedial action (Areas 2, 6, 11, 16, 23, 28 and 35). See Figure 5-12. The seven shallow soil areas are named on Figure 5-12 by blue circles, and the blue lines outline the boundaries of the properties within which these seven areas are found. The black dots and triangles show the soil or soil gas sampling locations where exceedances of screening levels were encountered in each of the seven areas. The green lines depict the former plant facility most likely to have caused the contamination found.

The specific chemicals found to pose unacceptable risks at the various locations include benzene, tetrachloroethene, i-propyltoluene, trichloroethene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, 4,4-DDT, NDPA, and copper. When released into the environment, the VOCs mostly migrated through the shallow soil and accumulated at the water table. Some residual amounts remained in the shallow soil, enough in several locations to warrant remedial action. The PAHs, pesticides/PCBs, and metals did not migrate significantly; they remained in the shallow soil near the location of their release.

The remainder of this section will focus on describing the characteristics of the areas where remedial action is warranted, both the shallow soil and the deep soil groundwater contamination source areas.

### 5.6 Nature and Extent of Contamination

Six facilities of the former rubber plant appear to be associated with releases at the seven locations determined by this ROD to warrant remedial action. Section 2.0, Site History and Enforcement Actions, described the former rubber plant activities that occurred in these areas, including chemicals stored, transported, or processed. The nature and extent of contamination discussion is organized according to these six areas. Figure 5-12 shows the locations of the six areas discussed in this section.

#### Tank Farm Facility (Styrene Plancor)

The tank farm facility is located in the western part of the former styrene plancor, mostly within Area 23, but it extends a short distance onto Area 16 (see Figure 2-1). VOCs found in the shallow soil at actionable risk levels include benzene, chloroform, tetrachloroethene, trichloroethene, and acetone. Other contaminants contributed to the risk to a lesser degree. These VOC contaminants were found in the outdoor soil; PCE was additionally found in the subspace beneath the southern end of the building in this area. The Area 23 property (assessor's parcel number 7351-034-057, 19875 Pacific Gateway Drive) currently contains an active warehousing and distribution business.

Two locations within the tank farm area have been identified as groundwater contamination source areas that warrant remediation. In SA-3, floating NAPL was found in monitoring well MW-20 (as discussed in Section 2.4). SA-3 is located along the northern boundary of Area 23 and extends a short distance into Area 16. Despite the initial finding of floating NAPL within well MW-20, extensive follow-up investigations found that the NAPL is present at relatively low average saturations that do not appear to be mobile. NAPL cannot migrate under natural conditions when at or below residual saturation levels. The primary contaminants present in the LNAPL site areas are benzene and ethylbenzene. NAPL is also known to be present in the vadose zone at residual saturations. The areal extent of the NAPL at SA-3 is estimated at 50,000 square feet (sf).

The second location, SA-6, is located along the eastern side of the building on the Area 23 property. NAPL was observed at residual saturations primarily in the vadose zone, although minor amounts were

found in the saturated zone. The primary contaminants present are benzene and ethylbenzene. The areal extent of the NAPL at SA-6 is estimated at 33,000 sf.

#### **Styrene and Ethylbenzene Production Facilities (Styrene Plancor)**

The styrene and ethylbenzene production facilities were located in the central part of the former styrene plancor. Contamination was found in the shallow soil in two areas at levels that warrant remedial action. The two areas are designated Area 28 and Area 35. Area 28 (assessor's parcel number 7351-034-069) is located at 19780 Pacific Gateway and is used as a warehouse business. Area 35 is the street, Magellan Drive. The risk-driving contaminant found in Area 28 was benzo(a)pyrene, which was found in one limited area in front of the building and one limited area behind the building (see Figure 5-12). The risk-driving contaminants found in Area 35 were benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzene, and tetrachloroethene, which were found in two areas in the southern part of the street and two areas in the middle to northern part of the street.

#### **Laboratory Facility (Butadiene Plancor)**

The laboratory facility of the butadiene plancor is located on the eastern side of the former butadiene plancor, near the southern end. It is located mainly on the parcel designated Area 5 (assessor's parcel number 7351-033-017), located at 20101 Hamilton Avenue (see Figure 5-12). The property is currently used as an office building with asphalt-paved parking lots surrounding the building. The laboratory facility also extended a short distance onto what is now the property adjoining to the north, designated Area 11 (assessor's parcel number 7351-033-034), located at 19901 South Hamilton Avenue. No contaminants were found in the shallow soil of Area 5 that warranted remedial action, thus Figure 5-12 does not show the "Area 5" designation. Benzene was found in the shallow soil of Area 11 at levels that warranted remedial action.

LNAPL was also found in this area and warrants remedial action. This NAPL area is designated SA-12. The release appears to have occurred in the center of what is now the northeast parking lot of the current building, and extends out covering that entire section of the parking lot, the very southern edge of Area 11 (adjoining to the north), and eastward beneath Hamilton Avenue. The eastern edge of the NAPL occurrence has not yet been delineated, but will be during remedial design. The NAPL is inferred to be a complex of benzene, other BTEX (benzene, toluene, ethylbenzene, and xylene) compounds, styrene, and numerous other VOCs, SVOCs), and unidentified compounds in the C10-C23 range. NAPL is also known to be present in the vadose zone, but in lesser amounts. All the NAPL in SA-12 exists at residual saturations. The areal extent of the NAPL at SA-12 was initially estimated at 22,500 sf, although additional NAPL investigations conducted in 2009-2010 indicated that the area could exceed 100,000 sf.

#### **Benzene Pipeline Facility (Butadiene Plancor)**

The benzene pipeline facility is located in the southern part of the former butadiene plancor. The contamination from the pipelines spread across three parcels designated as Area 6 (assessor's parcel number 7351-033-022) located at 20221 South Hamilton Avenue; Area 9 (assessor's parcel number 7351-033-027) located at 20280 Vermont Avenue; and Area 15 (assessor's parcel number 7351-033-900), which runs behind the other two parcels (see Figure 5-12). Office buildings are present in both Area 6 and Area 9, with asphalt-paved parking lots around the buildings. Area 15 is a high-voltage power transmission corridor with asphalt-paved parking beneath the power lines. In the shallow soil, contaminants warranting remedial action were only found within Area 6. The risk-driving chemical is benzene, which was found within the parking lot on the western side of the parcel.

NAPL was also found in the benzene pipeline area, designated as SA-11. The release appears to have occurred at what is now the border of the three parcels, and spread outward onto all three but mostly

onto Area 9, behind the existing building. The primary contaminants present in the LNAPL are benzene and ethylbenzene. The NAPL is found predominantly in the saturated zone with a smaller amount found in the vadose zone. All the NAPL found was at residual saturations. The areal extent of the NAPL at SA-11 was initially estimated at 38,000 sf.

#### **Rubber Production Facility (Copolymer Plancor)**

The rubber production facility is located in the northeast corner of the former copolymer plancor. It is located entirely on the parcel designated as Area 2 (assessor's parcel number 7351-031-020) located at 950 West 190<sup>th</sup> Street. The property has an office building and asphalt-paved parking surrounding the building. The contaminants found in the shallow soil that warranted remedial action were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene. These chemicals were found in a limited area of the parking lot in the southwest corner of the parcel (see Figure 5-12).

#### **Pits and Trenches Facility (Copolymer Plancor)**

The pits and trenches facility is located in the southwest corner of the former copolymer plancor. It is located in the northwest corner of Area 16 (assessor's parcel number 7351-034-015/050/056) located at 19681 Pacific Gateway Drive. The property comprises three parcels owned by the same entity and used for a printing business. The southern end of these parcels is part of the tank farm facility, but the contamination associated with the pits and trenches is separate from the tank farm. At the pits and trenches, shallow soil contamination was found at levels warranting remedial action. The risk-driving chemicals were 4,4-DDT, benzo(a)pyrene, dibenzo(a,h)anthracene, n-nitrodiphenylamine, tetrachloroethene, benzene, chloroform, trichloroethene, 1,2,4-trimethylbenzene, and styrene. The contamination is located beneath the parking lot and loading area along the northwest corner of the building. In the loading dock area, contamination warranting remedial action was found beneath the building foundation slab. In addition, VOC contamination was found at one location farther south, beneath the center of the building.



## 6.0 Current and Potential Future Land and Water Uses

### 6.1 Current Land Uses

The former plant site (outlined in red on Figure 6-1) comprises approximately 280 acres, and has been redeveloped into a commercial/industrial business park. All surface facilities associated with the former plant have long been dismantled and removed, although some concrete foundations or other remnants of previous structures have been encountered in the subsurface during the environmental investigations. The former plant site had been subdivided into 67 separate parcels as of the date of the Soil and NAPL RI, nearly all of which are developed. (Since that time, one of the parcels was further subdivided such that there are now 83 parcels.) The parcel boundaries are depicted by white lines on Figure 6-1. Buildings, paved parking areas, streets, and landscaped areas currently cover more than 90 percent of the former plant site. The remaining undeveloped areas consist of Los Angeles Department of Water and Power (LADWP) parcels used for high-voltage power transmission lines (one is paved, one is not), the former plant site Waste Pits Area (unpaved but covered with a multi-layer cap), and an adjacent unpaved property used for bin and dumpster storage.

Currently, 68 buildings and 5 surface streets occupy the former plant site, with building footprints ranging up to 215,000 sf. The zoning for most of the parcels is for heavy or light manufacturing/industrial, and one parcel (containing a hotel) has a dual industrial/commercial zoning designation (see Figure 6-1). The buildings are used primarily for warehouse/freight operations, manufacturing, and office space. The two parcels containing the LADWP power lines are zoned as "public facilities." All current structures at the former plant site are limited to business use and there are no known residents.

The area surrounding the former plant site is zoned for manufacturing/industry to the north, east, and west. A residential area is present approximately 650 feet north of the former plant site, across the 405 freeway. Residential and industrial zoned areas border the former plant site to the south. An approximately three-block portion of the residential area immediately south of the Waste Pits Area was razed after being purchased by Shell Oil Company and the U.S. Government in 1998. This area is currently vacant.

### 6.2 Potential Future Site and Resource Uses

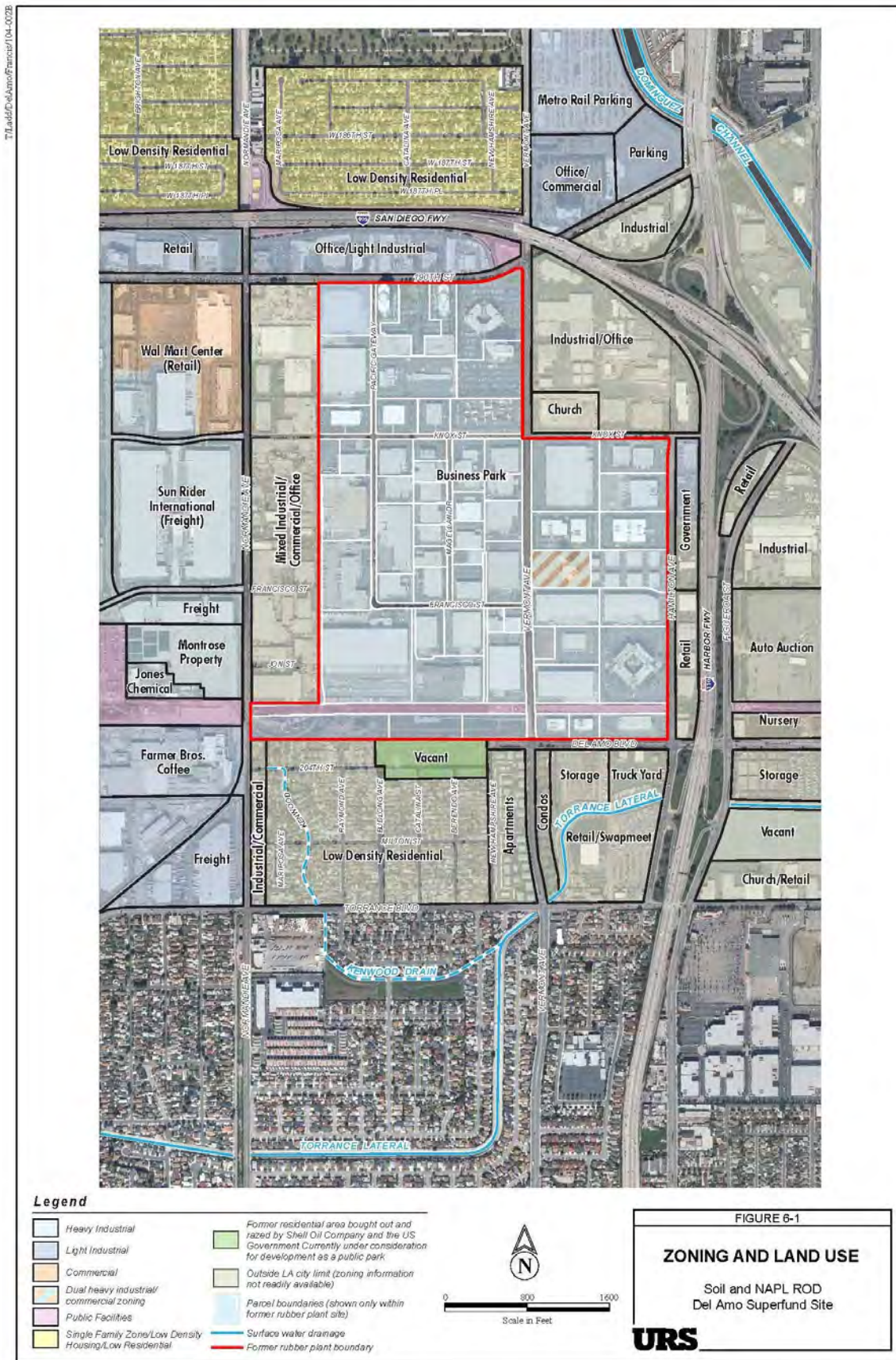
The reasonably anticipated future use of the former plant site is commercial use, the same as it is now. However, the possibility that residential use could be considered at some point in the future cannot be precluded. All but three of the current parcels of land are zoned as heavy or light manufacturing/industrial. One parcel has a dual industrial-commercial zoning designation, and two parcels are zoned as "public facilities" (which are the high voltage power transmission lines). The neighboring areas to the north (across the 405 freeway) and south (immediately across Del Amo Boulevard) are residential. This information was obtained from the City of Los Angeles General Plan. According to the city planning department, the current zoning is not expected to change.

### 6.3 Groundwater Use and Designations

The State of California designates all of the groundwater under the site as municipal supply beneficial use, that is, as being a potential source of drinking water. Currently, no known municipal water supply or production wells exist within the area of contaminated groundwater under the site. The nearest municipal supply wells are about 0.5 to 1 mile downgradient of the site.

PART II DECISION SUMMARY

SECTION 6.0: CURRENT AND POTENTIAL FUTURE LAND AND WATER USE



## 7.0 Summary of Site Risks

EPA completed a Baseline Risk Assessment (BRA) for the Soil and NAPL OU in 2006 (Geosyntec and URS, 2006). A revision to exposure point concentrations (EPCs) for six parcels was included in the FS in 2010 (URS, 2010). The BRA estimates the risks the site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The BRA evaluated potential health risks to commercial workers, construction workers (called "trench workers"), and hypothetical future residents at the Del Amo Site, associated with chemicals within the Soil and NAPL OU. Potential exposures to chemicals detected in surface and shallow soils were evaluated for the direct contact pathways as well as inhalation of volatile chemicals in indoor and outdoor air and fugitive dust. The potential for volatile chemicals to migrate from the subsurface to indoor air was evaluated for deeper vadose zone soils and groundwater. An ecological risk assessment was performed to evaluate potential risks from site COCs to ecological receptors. This section summarizes the results of the BRA for this site.

### 7.1 Summary of Human Health Risk Assessment

This summary of health risk includes sections on the identification of COCs, the exposure assessment, toxicity assessment, and risk characterization. The human health risk assessment estimated potential risks for the following groups: (1) current commercial workers, (2) current trench workers,<sup>3</sup> and (3) hypothetical future residents. These estimated risks for the most part are potential risks if current conditions change at the former plant site. The area is currently covered with asphalt and buildings, preventing exposure to contaminated soil. If exposures were to occur in the future, the estimated risks could be realized. The exception is two buildings with the potential for experiencing exceedances of volatile organic chemicals within the building, caused by intrusion by contaminants underlying the buildings. Although there is the potential for current exceedances, it is believed such exceedances are not being experienced due to the level of ventilation in the building.

The former plant site was divided into exposure areas. An exposure area is the area where a receptor could be exposed to Site-related contaminants. At the Del Amo Site, the receptors are the business park employees, so the exposure area would be their workplace. Therefore, the exposure areas were defined as the parcel boundaries where they are employed. The health risks were then evaluated for each parcel area.

Areas meeting one or more of the following criteria were selected as "exposure areas of potential concern" (EAPCs):

1. The parcel overlaps one or more of the 12 groundwater contamination source areas defined in the Dual Site Groundwater RI Report. Groundwater contamination source areas typically encompass areas of elevated VOCs in soil and/or soil gas samples associated with an underlying groundwater contaminant plume.
2. One or more VOCs, SVOCs, pesticides, or PCBs were detected in samples from the parcel at levels exceeding their respective Region IX or CAL-Modified preliminary remediation goal (PRG) S for

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<sup>3</sup> The risk assessment determined that the construction activity that would result in the highest exposure to Site-related contamination would be laborers working in a trench. Thus, the construction worker exposure scenario was called the "trench worker" scenario. The scenario was concerned with workers performing routine construction activities, not hazard material related activities.



residential soil. This includes soil gas samples converted into equivalent soil matrix values. One or more metals were detected at the parcel above background and above their respective PRGs. The parcel is surrounded by other parcels that were selected as EAPCs.

A total of 37 EAPCs were identified, and risk calculations were completed for each of these EAPCs. Exposure areas not selected as an EAPC did not meet any of the above criteria.

#### **Identification of Contaminants of Concern**

Based on the data collected during the RI, COCs were identified for each EAPC, and exposure point concentrations (EPCs) were calculated. EPCs are the concentrations that are used to estimate the exposure and risk from each COC in the soil. EPCs are calculated for each of the COCs contributing. Table 7-1 presents the COCs for each EAPC that contributed to the majority of the risk and hazard (risk-driving chemicals) for the commercial risk assessment scenario.

Table 7-1 indicates that the COCs that contribute to the majority of risk from outdoor shallow soil include benzene; various PAHs including benzo(a)pyrene [B(a)P], benzo(a)anthracene, benzo(b)fluoranthene; and metals including arsenic, cadmium, thallium and vanadium. Inhalation risks in outdoor or indoor air include several VOCs, but primarily benzene, PCE, and TCE.

#### **Exposure Assessment**

The exposure assessment evaluates the magnitude, frequency, duration, and routes of potential human exposure to site-related COPCs. The assessment considers both potential risk to current and potential future site uses, and considers a range of possible exposure scenarios. The current site use is commercial, and the potential risk is to commercial workers and trench workers. The potential future site use is residential, and the potential risk in that scenario would be to residents.

Potential receptor groups are identified in the exposure assessment and estimates of exposure or chemical intake are calculated based on assumptions regarding exposure pathways and exposure parameters. The exposure assessment focuses on the COCs detected in soil, soil gas, groundwater, and indoor air at the site. The primary routes of potential human exposure include incidental ingestion, dermal contact, inhalation of fugitive dust, and inhalation of vapors in indoor and outdoor air. These routes of exposure are identified in the CSM for the Del Amo Site, in Section 4.1 of the 2006 BRA. The CSM for the Del Amo Site, illustrated in Figure 5-1, shows all potentially complete exposure pathways for human exposures.

Both central tendency (CT) and reasonable maximum exposure (RME) estimates were developed for the exposure scenarios.<sup>4</sup> The RME estimates used reasonable conservative modeling assumptions (those which tend to overestimate exposure point concentrations) and upper bound (or high) default values for most exposure parameters. The intent of the RME scenario is to focus the assessment on a conservative exposure that is the maximum exposure that is reasonably expected to occur (EPA, 1989). Because of the multiple conservative assumptions used in the risk assessment process, the RME is often an over-estimate of exposure and risk.

As depicted in the CSM, the exposure pathways for the site under current and future land use conditions considered in this risk assessment are presented in Table 7-2.

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<sup>4</sup> The central tendency (CT) and reasonable maximum exposure (RME) were both developed for comparison purposes. The RME is the standard exposure utilized per EPA risk assessment guidance.

Exposure parameter values were selected based on values presented in the following EPA guidance documents: *Supplemental Guidance: Standard Default Exposure Factors* (1991); *Dermal Exposure Assessment: Principles and Applications* (1992 and 2000a); *Supplemental Guidance for Dermal Risk Assessment* (2004), *Superfund's Standard Default Exposure Factors for The Central Tendency and Reasonable Maximum Exposure* (1993a); and *Exposure Factors Handbook* (1997b). Several exposure parameters are briefly discussed below.

Commercial workers were assumed to be exposed to COPCs for 8 hours per day, 250 days per year (5 days per week for 50 weeks, accounting for a 2-week vacation) for 25 years for the RME scenario (EPA, 1991). The exposure duration was assumed to be 6.6 years for the CT exposure scenario, consistent with the average time a person works at one location (EPA, 1997b).

A trench worker (construction worker) exposure scenario was evaluated but did not result in any risk exceeding action levels.

Hypothetical future residents were assumed, for the RME scenario, to be exposed to COPCs 350 days per year (allowing 15 days per year for vacations and holidays) for 24 years for adults, and 6 years for children (EPA, 1991). For the CT residential scenario, the exposure duration was assumed to be 7 years for adults and 2 years for children, consistent with the average residence time of 9 years at one location (EPA, 1993a). The division between the child and adult exposure duration for the CT scenario is based on the assumptions used for the RME scenario, where an individual is assumed to be a child for 20 percent of the time (6 years) and an adult for 80 percent of the time (24 years) for a 30-year exposure. Therefore, for a 9-year CT exposure duration, this equates to 2 years as a child and 7 years as an adult. An average time of 25,550 days, based on lifetime exposure duration of 70 years, was used to model exposure to carcinogens. An average time equal to the exposure duration (in years) multiplied by 365 days per year was used to model exposures to non-cancer COPCs (EPA, 1989).

### **Toxicity Assessment**

Toxicity assessment characterizes the relationship between the magnitude of an exposure and the nature and magnitude of resulting adverse health effects. Adverse health effects are classified as carcinogenic and non-carcinogenic. For carcinogenic effects, it is assumed that any amount of exposure has the possibility of causing cancer, however small. For non-carcinogens it is believed that there is a threshold dose above which the toxic endpoint results.

**TABLE 7-1: COPCs Contributing to Majority of Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Commercial Exposure Scenario							
				COPC Cancer Risk Drivers (1)	Data Type	EPC (mg/kg)	Model Type	Chemical-Specific Cancer Risk	Total Cancer Risk	Chemical-Specific Non-cancer HI	Total Non-cancer Hazard
7351-031-020	2	Outdoor Surface Soil	Ingestion/Dermal	Benzo(a)pyrene	Max	0.7600	--	5.9E-06	<b>7E-06</b>	*	*
			Inhalation	*	*	--	--	*		*	
		Outdoor Shallow Soil	Ingestion/Dermal	Arsenic	UCL	10.8	--	6.8E-06	<b>1E-04</b>	*	*
				Benzo(a)anthracene	UCL	2.47	--	1.9E-06			
				Benzo(a)pyrene	Max	13	--	1.0E-04			
				Benzo(b)fluoranthene	Max	10	--	7.8E-06			
				Benzo(k)fluoranthene	UCL	4.82	--	3.8E-06			
				Indeno(1,2,3-cd)pyrene	Max	19	--	1.5E-05			
Inhalation	*	*	--	--	*	*					
Indoor Air - Modeled	Inhalation	*	*	--	*	*	*	*	*		
7351-033-022	6	Outdoor Shallow Soil	Ingestion/Dermal	*	*	--	--	*	<b>3E-06</b>	*	*
			Inhalation	Benzene	UCL	3.29	--	3.2E-06		*	
		Indoor Air - Modeled	Inhalation	Benzene	UCL	3.29	Tier 2	3.7E-06	<b>4E-06</b>	*	*
7351-033-034	11	Outdoor Surface Soil	Ingestion/Dermal	Arsenic	Max	14	--	8.8E-06	<b>9E-06</b>	*	*
			Inhalation	*	*	--	--	*		*	
		Outdoor Shallow Soil	Ingestion/Dermal	Arsenic	Max	14	--	8.8E-06	<b>2E-05</b>	*	*
			Inhalation	Benzene	UCL	6.27	--	6.1E-06		*	
		Indoor Air - Modeled	Inhalation	Benzene	UCL	6.27	Tier 2	7.0E-06	<b>7E-06</b>	*	*

## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-1: COPCs Contributing to Majority of Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Commercial Exposure Scenario							
				COPC Cancer Risk Drivers (1)	Data Type	EPC (mg/kg)	Model Type	Chemical-Specific Cancer Risk	Total Cancer Risk	Chemical-Specific Non-cancer HI	Total Non-cancer Hazard
7351-34-15,-50,-56	16	Outdoor Shallow Soil	Ingestion/Dermal	Cadmium	UCL	14	--	--	<b>3E-06</b>	0.01	<b>0.1</b>
				Manganese	UCL	560	--	--		0.004	
				4,4'-DDD	UCL	1.2	--	1.2E-07		--	
				4,4'-DDE	UCL	0.0906	--	1.3E-08		--	
				4,4'-DDT	UCL	7.4	--	1.1E-06		0.02	
				Aroclor 1260	UCL	0.0672	--	2.3E-07		--	
				Benzo(a)pyrene	UCL/dl	7.43	--	1.8E-07		--	
				Dibenzo(a,h)anthracene	UCL/dl	14.7	--	1.8E-08		--	
				N-Nitrosodiphenylamine	UCL	280	--	1.5E-06		0.02	
				Benzene	UCL/dl	11.2	--	4.2E-09		0.00003	
				Ethylbenzene	UCL	703	--	--		0.01	
				Styrene	UCL	786	--	--		0.01	
				Tetrachloroethene	UCL/dl	11.2	--	1.1E-07		0.0001	
			Trichloroethene	UCL/dl	11.3	--	7.8E-09	0.0003			
			Inhalation	Cadmium	UCL	14	--	1.7E-08	0.0005		
				Manganese	UCL	560	--	--	0.002		
				4,4'-DDD	UCL	1.2	--	2.3E-11	--		
				4,4'-DDE	UCL	0.0906	--	2.4E-12	--		
				4,4'-DDT	UCL	7.4	--	2.0E-10	--		
				Aroclor 1260	UCL	0.0672	--	1.1E-11	--		
Benzo(a)pyrene	UCL/dl	7.43		--	7.2E-12	--					
Dibenzo(a,h)anthracene	UCL/dl	14.7	--	2.2E-12	--						

**TABLE 7-1: COPCs Contributing to Majority of Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Commercial Exposure Scenario								
				COPC Cancer Risk Drivers (1)	Data Type	EPC (mg/kg)	Model Type	Chemical-Specific Cancer Risk	Total Cancer Risk	Chemical-Specific Non-cancer HI	Total Non-cancer Hazard	
				N-Nitrosodiphenylamine	UCL	280	--	2.0E-10	9E-06	--	0.3	
				Benzene	UCL/dl	11.2	--	7.1E-08		0.0001		
				Ethylbenzene	UCL	703	--	--		0.02		
				Styrene	UCL	786	--	--		0.02		
				Tetrachloroethene	UCL/dl	11.2	--	7.7E-08		0.001		
				Trichloroethene	UCL/dl	11.3	--	6.0E-08		0.0001		
				1,2,4-Trimethylbenzene	UCL/dl	2.42	Tier 1	--		0.0003		
				1,3,5-Trimethylbenzene	UCL/dl	0.3350	Tier 1	--	0.00003			
				4-Ethyl Toluene	UCL/dl	2.23	Tier 1	--	0.000004			
				Acetone	UCL/dl	519	Tier 1	--	0.00001			
				Benzene	UCL/dl	11.2	Tier 2	8.1E-08	0.0001			
		Chloroform	UCL/dl	15.6	Tier 1	6.7E-08	0.0001					
		Ethylbenzene	UCL	703	Tier 2	--	0.01					
		Naphthalene	UCL	0.1430	Tier 1	--	0.0002					
		Styrene	UCL	786	Tier 1	--	0.2					
		Tetrachloroethene	UCL/dl	11.2	Tier 1	5.5E-06	0.07					
		Toluene	UCL/dl	11.2	Tier 2	--	0.0001					
		Trichloroethene	UCL/dl	11.3	Tier 1	3.4E-06	0.008					
		Xylenes	UCL/dl	32.4	Tier 2	--	0.0000001					
				Inhalation of Deep Soil Vapors	1,1,1-Trichloroethane	UCL/dl	0.0500	Tier 1	--	7E-07	0.00002	0.004
					1,1-Dichloroethene	UCL/dl	0.0500	Tier 1	--		0.002	
					Benzene	UCL	6.9	Tier 2	6.5E-07		0.001	

**TABLE 7-1: COPCs Contributing to Majority of Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Commercial Exposure Scenario							
				COPC Cancer Risk Drivers (1)	Data Type	EPC (mg/kg)	Model Type	Chemical-Specific Cancer Risk	Total Cancer Risk	Chemical-Specific Non-cancer HI	Total Non-cancer Hazard
7351-34-57	23	Outdoor Shallow Soil	Ingestion/Dermal	Ethylbenzene	UCL	0.6110	Tier 2	--	<b>1E-05</b>	0.000001	<b>0.05</b>
				Tetrachloroethene	UCL/dl	0.0500	Tier 1	1.5E-08		0.0002	
				Trichloroethene	UCL/dl	0.0500	Tier 1	1.7E-08		0.00004	
			Benzene	UCL	13.5	--	7.8E-07	0.005			
			Ethylbenzene	UCL	577	--	--	0.009			
			Tetrachloroethene	UCL/dl	2.78	--	2.3E-08	0.00001			
			Trichloroethene	UCL/dl	2.76	--	9.0E-12	0.0000003			
			Inhalation	Benzene	UCL	13.5	--	1.3E-05	0.02		
		Ethylbenzene		UCL	577	--	--	0.01			
		Tetrachloroethene		UCL/dl	2.78	--	1.6E-08	0.0002			
		Trichloroethene		UCL/dl	2.76	--	6.9E-11	0.0000002			
Indoor Air - Modeled	Inhalation of Shallow Soil Vapors	1,1,1-Trichloroethane	UCL/dl	2.76	Tier 1	--	<b>2E-05</b>	0.00001	<b>0.05</b>		

**TABLE 7-2: Exposure Pathways**

Receptor	Exposure Media	Exposure Route
Commercial worker	Surface soil	Incidental ingestion Dermal contact Fugitive dust Inhalation
	Shallow soil/soil gas	Incidental ingestion Dermal contact Fugitive dust and vapor inhalation Vapor inhalation in indoor air
	Deep soil/soil gas	Vapor inhalation in indoor air
	Groundwater (water table only)	Vapor inhalation in indoor air
	Indoor air	Vapor inhalation in indoor air
Hypothetical future resident	Shallow soil/soil gas	Incidental ingestion Dermal contact Fugitive dust and vapor inhalation Vapor inhalation in indoor air
	Deep soil/soil gas	Vapor inhalation in indoor air
	Groundwater (water table only)	Vapor inhalation in indoor air
Trench worker	Shallow soil/soil gas	Incidental ingestion Dermal contact Fugitive dust inhalation

The toxicity assessment for the Soil and NAPL OU was presented in the BRA. Appendix G of the BRA presents detailed discussions of the toxicity of the primary risk-driving COCs. The eight chemicals that contributed significantly to estimates of cancer risk or non-cancer hazard are arsenic, benzene, chloroform, carcinogenic PAHs, 1,2-DCE, methylene chloride, PCE, and TCE. Tables 7-3 and 7-4 present the cancer slope factors (CSFs) available for the carcinogenic COCs that contributed significantly to the risk. When available, California Environmental Protection Agency CSFs were also identified. Tables 7-5 and 7-6 present the non-cancer toxicity criteria for the risk-drivers, as well as the associated uncertainty factors used in their derivation.

### Risk Characterization

Risk characterization integrates the results of the toxicity assessment and the exposure assessment to estimate potential carcinogenic risks and adverse non-carcinogenic health effects associated with exposure to chemicals detected at the site. This integration provides quantitative estimates of risk and non-cancer hazard that are then compared to acceptable standards.

Excess cancer risk is estimated by multiplying the lifetime average daily dose (LADD) by the chemical carcinogenic toxicity criteria or CSF. The equation used to estimate the excess cancer risk is:

$$\text{Excess Cancer Risk} = \text{LADD} \times \text{CSF}$$

Chemical-specific hazard quotients are estimated by calculating the ratio of the average daily dose (ADD) to the corresponding chronic reference dose (RfD) for non-carcinogenic effects. The equation used to estimate the hazard quotient is:

$$\text{Hazard Quotient} = \text{ADD}/\text{RfD}$$

The hazard quotients are then summed to form a hazard index (HI), which is compared to an acceptable hazard level. HIs less than the benchmark HI of 1 indicate that no adverse health effects are expected.

The maximum acceptable cancer risk level ranges between 1E-06 and 1E-04 and is selected on a case-by-case basis by EPA. These values correspond to lifetime incremental cancer risks between 1 in 1 million (1E-06) and 100 in 1 million (1E-04). Non-cancer health hazards due to chemical exposures are evaluated by comparisons of the calculated (HI) to the benchmark HI of 1.

A situation arose for some EAPCs whereby elevated laboratory detection limits drove the risk. Typically, when a laboratory sample was non-detect, it was assigned a value for the risk assessment equal to one half of the detection limit ( $\frac{1}{2}$ \*DL) for that analyte. At the EAPCs in question, the  $\frac{1}{2}$ \*DL value was greater than the maximum observed concentration of the analyte at the site overall, leading to substantial overestimation of risk. Therefore, the risk estimates were recalculated. The recalculation of the risk estimates was performed, in accordance with the Risk Assessment Guidance for Superfund (EPA, 2001, Part D, Chapter 5), after deleting the non-detect samples for which  $\frac{1}{2}$ \*DL > max. This situation affected EAPCs 5, 7, 16, 23, 24 and 35. The revised risk estimates are reflected in the tables presented in this section.

Potential exposures have been evaluated for the three receptor types (commercial worker, trench worker, and hypothetical future resident) for each EAPC. Table 7-8 as well as Table 7-1 present the results for the commercial worker exposure scenario.

The chemical- and pathway-specific risks for each EAPC that comprise the summary risk estimates are presented in the 2006 BRA, Appendix D and the 2010 FS, Appendix B.

## 7.2 Ecological Risks

The 2006 BRA was primarily focused on evaluation of potential risks to human health due to the highly developed, urban nature of the site and limited habitat for wildlife species. However, the southern margin of the site is known to provide raptor habitat, as confirmed by observations of an American kestrel (*Falco sparverius*). The 2006 BRA therefore included an Ecological Risk Assessment (ERA) that focused on evaluation of risks to the local kestrel population, based on the sightings of the individual kestrel inferred to be residing within an approximately 24-acre undeveloped area, of which approximately 15 acres are within the southern portion of the former plant site.

The ERA assumed an exposure to soils from ground surface to 1.5 feet bgs (where the kestrel was expected to find food and incidentally ingest soil), and kestrel-specific toxicity reference values (TRVs) for DDT metabolites. The ERA concluded that although adverse effects to an individual kestrel may occur from exposure to pesticides in surface soils from the on-site habitat, effects to the population are expected to be negligible. The overall approach was conservative, and the ERA indicated that using more site-specific assumptions would likely demonstrate a low potential for adverse effects to populations, and possibly even to individual kestrels.



## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-3**  
**CANCER TOXICITY DATA - ORAL/DERMAL**  
**Baseline Risk Assessment**  
**Del Amo Site**

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
<b>Metals</b>							
Arsenic	1.5E+00	100%	1.5E+00	(mg/kg-day) <sup>(1)</sup>	A	CalEPA 2004	10/2004
<b>Pesticides/PCBs</b>							
4,4'-DDD	2.4E-01	100%	2.4E-01	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
4,4'-DDE	3.4E-01	100%	3.4E-01	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
4,4'-DDT	3.4E-01	100%	3.4E-01	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Aroclor 1260	5.0E+00	100%	5.0E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
<b>SVOCs</b>							
Benzo(a)anthracene	1.2E+00	100%	1.2E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Benzo(a)pyrene	1.2E+01	100%	1.2E+01	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Benzo(b)fluoranthene	1.2E+00	100%	1.2E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Benzo(k)fluoranthene	1.2E+00	100%	1.2E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Dibenzo(a,h)anthracene	4.1E+00	100%	4.1E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
Indeno(1,2,3-cd)pyrene	1.2E+00	100%	1.2E+00	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
N-Nitrosodiphenylamine	9.0E-03	100%	9.0E-03	(mg/kg-day) <sup>(1)</sup>	B2	CalEPA 2004	10/2004
<b>VOCs</b>							
Benzene	1.0E-01	100%	1.0E-01	(mg/kg-day) <sup>(1)</sup>	A	CalEPA 2004	10/2004
Tetrachloroethene	5.4E-01	100%	5.4E-01	(mg/kg-day) <sup>(1)</sup>	N/A	CalEPA 2004	10/2004
Trichloroethene	1.3E-02	100%	1.3E-02	(mg/kg-day) <sup>(1)</sup>	N/A	CalEPA 2004	10/2004

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

N/A = Not Available

(1) Refer to RAGS, Part A. Also see text in Section 4.0.

EPA Cancer Guideline Description:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

Source:

California Environmental Protection Agency (Cal EPA). 2004. Toxicity Criteria Database. OEHHA.

U.S. Environmental Protection Agency (USEPA). 2004. Integrated Risk Information System (IRIS) Online Database.

U.S. Environmental Protection Agency Region IX (USEPA). 2002. Preliminary Remediation Goal (PRG) Table. October.

U.S. Environmental Protection Agency (USEPA). 1997. HEAST.

## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-4**  
**CANCER TOXICITY DATA - INHALATION**  
**Baseline Risk Assessment**  
**Del Amo Site**

Chemical of Potential Concern	Inhalation Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
<b>Metals</b>								
Cadmium	4.2E-03	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	1.5E+01	(mg/kg-day) <sup>-1</sup>	B1	CalEPA 2004	10/2004
<b>Pesticides</b>								
4,4'-DDD	6.9E-05	N/A	N/A	2.4E-01	N/A	B2	CalEPA 2004	10/2004
4,4'-DDE	9.7E-05	N/A	N/A	3.4E-01	N/A	B2	CalEPA 2004	10/2004
4,4'-DDT	9.7E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	3.4E-01	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
Aroclor 1260	5.7E-04	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	2.0E+00	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
<b>SVOCs</b>								
Benzo(a)pyrene	1.1E-03	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	3.9E+00	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
Dibenzo(a,h)anthracene	1.2E-03	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	4.1E+00	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
N-Nitrosodiphenylamine	2.6E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	9.0E-03	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
<b>VOCs</b>								
1,2-Dichloroethane	2.1E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	7.2E-02	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
Benzene	2.9E-05	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	1.0E-01	(mg/kg-day) <sup>-1</sup>	A	CalEPA 2004	10/2004
Chloroform	5.3E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	1.9E-02	(mg/kg-day) <sup>-1</sup>	B2	CalEPA 2004	10/2004
Tetrachloroethene	5.9E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	2.1E-02	(mg/kg-day) <sup>-1</sup>	N/A	CalEPA 2004	10/2004
Trichloroethene	2.0E-06	(ug/m <sup>3</sup> ) <sup>-1</sup>	3500	7.0E-03	(mg/kg-day) <sup>-1</sup>	N/A	CalEPA 2004	10/2004

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

N/A = Not Available

EPA Cancer Guideline Description:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

Source:

California Environmental Protection Agency (Cal EPA), 2004. Toxicity Criteria Database, OEHHA.

U.S. Environmental Protection Agency (USEPA), 2004. Integrated Risk Information System (IRIS) Online Database.

U.S. Environmental Protection Agency Region IX (USEPA), 2002. Preliminary Remediation Goal (PRG) Table, October.

## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-5  
NONCANCER TOXICITY DATA - ORAL/DERMAL  
Baseline Risk Assessment  
Del Amo Site**

Chemical of Potential Concern	Chronic/Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD	Date
<b>Metals</b>										
Cadmium	chronic	1.0E-03	mg/kg-d	100%	1.0E-03	mg/kg-d	Kidney	10	IRIS	10/2004
Manganese	chronic	1.4E-01	mg/kg-d	100%	1.4E-01	mg/kg-d	CNS	1	IRIS	10/2004
<b>Pesticides</b>										
4,4'-DDT	chronic	5.0E-04	mg/kg-d	100%	5.0E-04	mg/kg-d	Liver	100	IRIS	10/2004
<b>SVOCs</b>										
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodiphenylamine	chronic	2.0E-02	mg/kg-d	100%	2.0E-02	mg/kg-d	N/A	N/A	NCEA	04/2003
<b>VOCs</b>										
Benzene	chronic	4.0E-03	mg/kg-d	100%	4.0E-03	mg/kg-d	Blood	300	IRIS	10/2004
Ethylbenzene	chronic	1.0E-01	mg/kg-d	100%	1.0E-01	mg/kg-d	Liver/Kidney	1000	IRIS	10/2004
Styrene	chronic	2.0E-01	mg/kg-d	100%	2.0E-01	mg/kg-d	Blood/Liver	1000	IRIS	10/2004
Tetrachloroethene	chronic	1.0E-02	mg/kg-d	100%	1.0E-02	mg/kg-d	Liver	1000	IRIS	10/2004
Trichloroethene	chronic	6.0E-03	mg/kg-d	100%	6.0E-03	mg/kg-d	Liver	N/A	USEPA 1999	10/01/99

## Notes:

N/A = Not Available; RE = route extrapolation; NOAEL = No Observed Adverse Effect Level

(1) Refer to RAGS, Part A. Also see text in Section 4.0.

## Source:

California Environmental Protection Agency (CalEPA). 2004. Toxicity Criteria Database. OEHHA.

NCEA: National Center for Environmental Assessment as referenced in USEPA, 2002.

U.S. Environmental Protection Agency (USEPA). 2004. Integrated Risk Information System (IRIS) Online Database.

U.S. Environmental Protection Agency Region IX (USEPA). 2002. Preliminary Remediation Goal (PRG) Table. October.

U.S. Environmental Protection Agency (USEPA). 1997. HEAST.

## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-6**  
**NONCANCER TOXICITY DATA - INHALATION**  
**Baseline Risk Assessment**  
**Del Amo Site**

Chemical of Potential Concern	Chronic/Subchronic	Inhalation RfC or REL Value	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC/RfD	Date
<b>Metals</b>									
Cadmium	chronic	2.0E-05	mg/m <sup>3</sup>	5.7E-06	mg/kg-d	Kidney	N/A	REL: CalEPA 2004	10/2004
Manganese	chronic	2.0E-04	mg/m <sup>3</sup>	5.7E-05	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004
<b>VOCs</b>									
1,1,1-Trichloroethane	chronic	1.0E+00	mg/m <sup>3</sup>	2.9E-01	mg/kg-d	Nervous System	N/A	REL: CalEPA 2004	10/2004
1,1-Dichloroethene	chronic	7.0E-02	mg/m <sup>3</sup>	2.0E-02	mg/kg-d	Liver	N/A	REL: CalEPA 2004	10/2004
1,2,4-Trimethylbenzene	chronic	6.0E-03	mg/m <sup>3</sup>	1.7E-03	mg/kg-d	CNS	3000	NCEA/USEPA 2002	10/2002
1,2-Dichloroethane	chronic	4.0E-01	mg/m <sup>3</sup>	1.1E-01	mg/kg-d	Liver	N/A	REL: CalEPA 2004	10/2004
1,3,5-Trimethylbenzene	chronic	6.0E-03	mg/m <sup>3</sup>	1.7E-03	mg/kg-d	CNS	3000	NCEA/USEPA 2002	10/2002
4-Ethyl Toluene (as xylenes)	chronic	7.0E-01	mg/m <sup>3</sup>	2.0E-01	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004
Acetone	chronic	3.2E+00	mg/m <sup>3</sup>	9.0E-01	mg/kg-d	Kidney	1000	IRIS/RE	10/2004
Benzene	chronic	6.0E-02	mg/m <sup>3</sup>	1.7E-02	mg/kg-d	Blood	N/A	REL: CalEPA 2004	10/2004
sec-Butylbenzene	chronic	1.4E-01	mg/m <sup>3</sup>	4.0E-02	mg/kg-d	Liver/Kidney	10000	NCEA/USEPA 2002/RE	10/2002
Chloroform	chronic	3.0E-01	mg/m <sup>3</sup>	8.6E-02	mg/kg-d	Kidney	N/A	REL: CalEPA 2004	10/2004
Ethylbenzene	chronic	2.0E+00	mg/m <sup>3</sup>	5.7E-01	mg/kg-d	Developmental	N/A	REL: CalEPA 2004	10/2004
Isopropylbenzene (cumene)	chronic	3.9E-01	mg/m <sup>3</sup>	1.1E-01	mg/kg-d	Kidney	N/A	IRIS	10/2004
Naphthalene	chronic	9.0E-03	mg/m <sup>3</sup>	2.6E-03	mg/kg-d	Nasal Effects	N/A	REL: CalEPA 2004	10/2004
n-Propylbenzene	chronic	1.4E-01	mg/m <sup>3</sup>	4.0E-02	mg/kg-d	N/A	N/A	NCEA/USEPA 2002/RE	10/2002
Styrene	chronic	9.0E-01	mg/m <sup>3</sup>	2.6E-01	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004
Tetrachloroethene	chronic	3.5E-02	mg/m <sup>3</sup>	1.0E-02	mg/kg-d	Liver/Kidney	N/A	REL: CalEPA 2004	10/2004
Toluene	chronic	3.0E-01	mg/m <sup>3</sup>	8.6E-02	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004
Trichloroethene	chronic	6.0E-01	mg/m <sup>3</sup>	1.7E-01	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004
Xylenes	chronic	7.0E-01	mg/m <sup>3</sup>	2.0E-01	mg/kg-d	CNS	N/A	REL: CalEPA 2004	10/2004

## Notes:

N/A = Not Available; RE = route extrapolation; REL = Reference Exposure Level

(1) Adjustment made to RfC or REL: Inhalation RfD = (RfC or REL) x (20 m<sup>3</sup>/day) x (1/70 kg)

## Source:

California Environmental Protection Agency (CalEPA). 2004. Toxicity Criteria Database. OEHHA.

NCEA: National Center for Environmental Assessment as referenced in USEPA, 2002.

U.S. Environmental Protection Agency (USEPA). 2004. Integrated Risk Information System (IRIS) Online Database.

U.S. Environmental Protection Agency Region IX (USEPA). 2002. Preliminary Remediation Goal (PRG) Table. October.

U.S. Environmental Protection Agency (USEPA). 1997. HEAST.

**TABLE 7-7: Risk and Hazard Index Summary by Receptor and Pathway**

Receptor	Pathway	EAPCs in Risk / Hazard Index Groups Using Reasonable Maximum Exposures		
		Risk $\leq 10^{-6}$ and HI $\leq 1$	$10^{-6} < \text{Risk} \leq 10^{-4}$ and HI $\leq 1$	Risk $>10^{-4}$ and/or HI $>1$
Commercial Worker	Outdoor Soil	1, 5, 8, 9, 10, 14, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 31, 37 (18 of 37)	2, 3, 4, 6, 7, 11, 12, 13, 15, 16, 23, 28, 29, 30, 32, 33, 34, 35, 36 (19 of 37)	(0 of 37)
	Indoor Air (Tier 1/Tier 2 Modeling)	1, 2, 3, 4*, 8, 9, 10, 12, 13, 14, 17, 18, 19, 21, 22, 25*, 26, 27*, 28, 29, 30, 31, 32, 36, 37 (25 of 37)	5, 6, 7, 11, 15**, 16, 20*, 23, 24, 33*, 34*, 35 (12 of 37)	(0 of 37)
Future Hypothetical Resident	Outdoor Soil	1, 18, 19, 20, 21, 22, 25, 26, 27, 31, 37 (11 of 37)	3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15, 17, 24, 30, 32, 33, 35, 36 (18 of 37)	2, 10, 14, 16, 23, 28, 29, 34 (8 of 37)
	Indoor Air (Tier 1/Tier 2 Modeling)	1, 2, 3, 4*, 10, 12, 13, 14, 18, 21, 26, 29, 30, 31*, 32, 36, 37 (17 of 37)	8, 9, 11, 17, 19, 20*, 22, 25*, 27*, 33*, 34* (11 of 37)	5, 6, 7, 15**, 16, 23, 24, 28, 35 (9 of 37)
Trench Worker	Outdoor Soil	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37 (35 of 37)	16, 23 (2 of 37)	(0 of 37)

Note:

Risk/hazard groups based on modeling of shallow soil/soil gas except as indicated otherwise

\*The indoor air risk/hazard value for this EAPC is based on modeling of groundwater data

\*\* The indoor air risk/hazard value for this EAPC is based on modeling of deep soil data

**TABLE 7-8: Cumulative Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Commercial Exposure Scenario			
			RME		CT	
			Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
7351-031-020	2	Outdoor Surface Soil	7E-06	--	2E-07	--
		Outdoor Shallow Soil	1E-04	0.06	1E-06	0.02
		Indoor Air/Tier 1 - Shallow	3E-08	0.00005	4E-09	0.00003
		Indoor Air/Tier 1 - Deep	--	--	--	--
		Indoor Air/Tiers 1&2 - Groundwater	7E-09	0.00005	--	--
		Indoor Air - Workplace	8E-05	0.9	1E-05	0.3
7351-033-022	6	Outdoor Surface Soil	--	--	--	--
		Outdoor Shallow Soil	3E-06	0.007	2E-07	0.001
		Indoor Air/Tier 1 - Shallow	2E-04	0.3	1E-05	0.07
		Indoor Air/Tier 1 - Deep	5E-05	0.2	3E-06	0.03
		Indoor Air/Tiers 1&2 - Shallow	4E-06	0.006	2E-07	0.001
		Indoor Air/Tiers 1&2 - Deep	2E-07	0.0007	1E-08	0.0001
		Indoor Air - Workplace	--	--	--	--
7351-033-034	11	Outdoor Surface Soil	9E-06	0.06	6E-07	0.02
		Outdoor Shallow Soil	2E-05	0.07	9E-07	0.02
		Indoor Air/Tier 1 - Shallow	4E-04	0.7	2E-05	0.1
		Indoor Air/Tier 1 - Deep	--	--	--	--
		Indoor Air/Tiers 1&2 - Shallow	7E-06	0.01	3E-07	0.002
		Indoor Air/Tiers 1&2 - Deep	--	--	--	--
		Indoor Air - Workplace	--	--	--	--
7351-034-015, -050,-056	16	Outdoor Surface Soil	--	--	--	--
		Outdoor Shallow Soil	3E-06	0.1	2E-06	0.02
		Indoor Air/Tier 1 - Shallow	1E-05	0.6	4E-05	0.8
		Indoor Air/Tier 1 - Deep	2E-04	0.3	7E-06	0.04
		Indoor Air/Tiers 1&2 - Shallow	9E-06	0.3	2E-05	0.5
		Indoor Air/Tiers 1&2 - Deep	7E-07	0.004	5E-08	0.004
		Indoor Air - Workplace	5E-05	0.3	6E-06	0.1
7351-034-057	23	Outdoor Surface Soil	--	--	--	--
		Outdoor Shallow Soil	1E-05	0.05	6E-07	0.008
		Indoor Air/Tier 1 - Shallow	9E-04	2	4E-05	0.4
		Indoor Air/Tier 1 - Deep	2E-03	4	2E-04	1
		Indoor Air/Tiers 1&2 - Shallow	2E-05	0.05	4E-06	0.1
		Indoor Air/Tiers 1&2 - Deep	9E-06	0.01	7E-07	0.004
		Indoor Air - Workplace	8E-05	0.1	2E-05	0.1

**TABLE 7-8: Cumulative Risk and Hazard, Commercial Worker Exposure Scenario**

Parcel	EAPC No.	Exposure Media	Commercial Exposure Scenario			
			RME		CT	
			Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
7351-034-069	28	Outdoor Surface Soil	--	--	--	--
		Outdoor Shallow Soil	8E-06	0.2	1E-07	0.05
		Indoor Air/Tier 1 - Shallow	2E-06	0.07	1E-07	0.01
		Indoor Air/Tier 1 - Deep	--	--	--	--
		Indoor Air/Tiers 1&2 - Shallow	4E-07	0.06	--	--
		Indoor Air/Tiers 1&2 - Deep	--	--	--	--
		Indoor Air - Workplace	1E-04	1	1E-05	0.4
Magellan Drive	35	Outdoor Surface Soil	--	--	--	--
		Outdoor Shallow Soil	3E-05	0.003	2E-07	0.0004
		Indoor Air/Tier 1 - Shallow	1E-04	0.3	4E-06	0.07
		Indoor Air/Tier 1 - Deep	2E-04	0.3	3E-05	0.2
		Indoor Air/Tiers 1&2 - Shallow	2E-06	0.007	3E-07	0.03
		Indoor Air/Tiers 1&2 - Deep	6E-07	0.0009	1E-07	0.0006
		Indoor Air/Tiers 1&2 - Groundwater	2E-07	0.0008	--	--
		Indoor Air - Workplace	--	--	--	--

## Notes:

- 1 RME = Reasonable Maximum Exposure
- 2 CT = Central Tendency
- 3 "--" not applicable; no COPCs selected for specified medium
- 4 Surface soil (0 to 1' bgs); Shallow soil (0 to 15' bgs)
- 5 "Outdoor" Soil Pathway includes Incidental Soil Ingestion, Dermal Contact, and Outdoor Air Inhalation of particulate/VOCs
- 6 "Indoor Air/Tier 1" estimated risk from exposure to indoor air concentrations (IACs) predicted using Tier 1 analysis. 'Shallow' indicates modeling using shallow soil data, and 'deep' indicates deep soil data was used.
- 7 "Indoor Air/Tiers 1&2" estimated risk from exposure to IACs of Tier 1 non-BTEX VOCs and Tier 2 BTEX results (if Tier 1 risk or hazard  $\geq 10^{-6}$  or 1)
- 8 "Indoor Air - Workplace" estimated risk from exposures to measured indoor air concentrations from the Workplace Air Monitoring Study

## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-9: EAPCS Exceeding Hypothetical Residential Risk**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Residential Exposure Scenario		Cancer Risk > 1E-06 or Non-cancer Hazard HI >1
				Total Cancer Risk	Total Non-cancer Hazard	
7351-031-018	1	Outdoor Shallow Soil	Ingestion/Dermal	*	2E-01	
			Inhalation	*		
		Indoor Air - Modeled	Inhalation	*	*	
7351-031-020	2	Outdoor Shallow Soil	Ingestion/Dermal	5E-04	1E+00	X
		Indoor Air - Modeled	Inhalation	*	*	
7351-031-031	3	Outdoor Shallow Soil	Ingestion/Dermal	4E-05	7E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	1E-01	
7351-031-007	4	Outdoor Shallow Soil	Ingestion/Dermal	1E-05	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	--	--	
7351-033-017	5	Outdoor Shallow Soil	Ingestion/Dermal	2E-05	3E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	4E-05	9E+00	
7351-033-022	6	Outdoor Shallow Soil	Ingestion/Dermal	8E-05	3E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	2E-04	5E-01	
7351-033-024	7	Outdoor Shallow Soil	Ingestion/Dermal	7E-05	1E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	2E-05	3E+01	
7351-033-026	8	Outdoor Shallow Soil	Ingestion/Dermal	2E-06	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	6E-06	*	
7351-033-026	9	Outdoor Shallow Soil	Ingestion/Dermal	1E-05	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	3E-05	*	
7351-033-030	10	Outdoor Shallow Soil	Ingestion/Dermal	*	3E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-033-034	11	Outdoor Shallow Soil	Ingestion/Dermal	8E-05	9E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	1E-04	3E-01	
7351-033-040	12	Outdoor Shallow Soil	Ingestion/Dermal	4E-05	7E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	



## PART II: DECISION SUMMARY

## SECTION 7.0: SUMMARY OF SITE RISKS

**TABLE 7-9: EAPCS Exceeding Hypothetical Residential Risk**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Residential Exposure Scenario		Cancer Risk > 1E-06 or Non-cancer Hazard HI >1
				Total Cancer Risk	Total Non-cancer Hazard	
7351-033-045	13	Outdoor Shallow Soil	Ingestion/Dermal	5E-05	1E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-033-009	14	Outdoor Shallow Soil	Ingestion/Dermal	*	1E+01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-033-900	15	Outdoor Shallow Soil	Ingestion/Dermal	1E-05	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	5E-04	1E+00	
7351-034-015, -050, -056	16	Outdoor Shallow Soil	Ingestion/Dermal	2E-05	6E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation of Shallow Soil Vapors	4E-04	1E+01	
			Inhalation of Deep Soil Vapors	8E-06	5E-02	
7351-034-039	17	Outdoor Shallow Soil	Ingestion/Dermal	4E-06	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	2E-05	9E-02	
7351-034-041	18	Outdoor Shallow Soil	--	--	--	
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-043	19	Outdoor Shallow Soil	*	*	*	X
		Indoor Air - Modeled	Inhalation	4E-06	*	
7351-034-045	20	Outdoor Shallow Soil	*	*	*	X
		Indoor Air - Modeled	Inhalation	2E-06	*	
7351-034-047	21	Outdoor Shallow Soil	--	--	--	
		Indoor Air - Modeled	Inhalation	*	*	
351-034-052	22	Outdoor Shallow Soil	*	*	*	X
		Indoor Air - Modeled	Inhalation	2E-06	*	

**TABLE 7-9: EAPCS Exceeding Hypothetical Residential Risk**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Residential Exposure Scenario		Cancer Risk > 1E-06 or Non-cancer Hazard HI >1
				Total Cancer Risk	Total Non-cancer Hazard	
7351-34-57	23	Outdoor Shallow Soil	Ingestion/Dermal	8E-04	6E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation of Shallow Soil Vapors	2E-03	8E+00	
			Inhalation of Deep Soil Vapors	1E-04	3E-01	
7351-034-058	24	Outdoor Shallow Soil	Ingestion/Dermal	1E-06	3E-05	X
			Inhalation			
		Indoor Air - Modeled	Inhalation of Shallow Soil Vapors	2E-07	2E-02	
			Inhalation of Deep Soil Vapors	1E-03	4E+00	
7351-034-066	25	Outdoor Shallow Soil	--	--	--	
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-067	26	Outdoor Shallow Soil	--	--	--	
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-067	27	No Applicable Media	--	--	--	
7351-034-069	28	Outdoor Shallow Soil	Ingestion/Dermal	9E-05	2E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	3E-05	4E+00	
7351-034-070	29	Outdoor Shallow Soil	Ingestion/Dermal	8E-05	2E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-072	30	Outdoor Shallow Soil	Ingestion/Dermal	9E-06	2E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-073	31	Outdoor Shallow Soil	--	--	--	
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-076	32	Outdoor Shallow Soil	Ingestion/Dermal	2E-05	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	

**TABLE 7-9: EAPCS Exceeding Hypothetical Residential Risk**

Parcel	EAPC No.	Exposure Media	Exposure Pathway of Concern	Residential Exposure Scenario		Cancer Risk > 1E-06 or Non-cancer Hazard HI >1
				Total Cancer Risk	Total Non-cancer Hazard	
7351-034-803	33	Outdoor Shallow Soil	Ingestion/Dermal	7E-06	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
7351-034-901	34	Outdoor Shallow Soil	Ingestion/Dermal	9E-05	2E+00	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
Magellan Drive	35	Outdoor Shallow Soil	Ingestion/Dermal	1E-04	*	X
			Inhalation			
		Indoor Air - Modeled	Inhalation of Shallow Soil Vapors	4E-05	2E-01	
Pacific Gateway (N)	36	Outdoor Shallow Soil	Ingestion/Dermal	6E-06	3E-01	X
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	
Pacific Gateway (S)	37	Outdoor Shallow Soil	Ingestion/Dermal	*	2E-01	
			Inhalation			
		Indoor Air - Modeled	Inhalation	*	*	

## Notes:

1 Chemicals listed have a Cancer Risk above 10<sup>-6</sup>

2 Chemicals listed have a Hazard Quotient above 0.1

" -- " not applicable; no COPCs selected for specified medium; " \* " Cancer Risk is below 10<sup>-6</sup> or the Non-cancer Hazard is below 0.1

"Outdoor Shallow Soil" Pathway includes Incidental Ingestion, Dermal Contact, and Outdoor Air Inhalation of particulate/VOCs in soils 0 to 15' bgs

"Data Type" Maximum detected (Max) or 1/2 the detection limit (DL) used as the EPC to calculate risk/hazard

"Model Type" The risk/hazard was estimated using Tier 1 J&amp;E analysis or the Tier 2 DLM analysis

**7.3 Basis for Action**

There are two bases for action at this site: (1) contaminated shallow soil and its potential threat to human receptors, and (2) contaminated deep soil and NAPL and their threat to the groundwater.

**Shallow Soil**

The former plant site is currently designated for commercial use and is currently occupied by 68 commercial buildings, including offices, warehouses, and manufacturing facilities.

- (a) The 2006 BRA identified nine EAPCs that warrant action where exposure of workers to contaminated soil or vapors could potentially cause an excess cancer risk above 1 in 1 million or a hazard index above 1.0. These areas are EAPCs 2, 6, 11, 16, 23, 28, 29, 34 and 35. The highest potential risk for commercial workers would be from benzo(a)pyrene, which was calculated to be a 100 in 1 million excess cancer risk at its highest concentration. Remedial action is therefore warranted to address these EAPCs, which will now be referred to as "areas." Seven of the areas will be addressed in this ROD (Areas 2, 6, 11, 16, 23, 28 and 35), and two areas will be addressed in a subsequent decision document (Areas 29 and 34).

For the seven areas of shallow soil contamination being addressed in this ROD, the exposure pathway for five of them (Areas 2, 6, 11, 28 and 35) would be from outdoor soil, and for two of these areas (Areas 16 and 23), an additional potential pathway would be volatile contaminants infiltrating into the indoor air (known as soil vapor intrusion). The shallow soil in the seven areas is currently covered by concrete, asphalt, or landscaping; however, these covers could be changed in the future in such a way as to cause exposure to the contaminated soil.

- (b) In the two areas with soil vapor intrusion potential, the buildings are well ventilated warehouse and industrial facilities where it is believed the workers are not currently exposed to levels of concern.
- (c) In addition to the seven areas that warrant cleanup action, the risk assessment identified 19 other areas where COCs from the former rubber plant could cause an unacceptable risk to occupants if the land use changed to residential. These other areas are Areas 4, 5, 7-10, 12-15, 17, 19, 20, 22, 24, 30, 32, 33, and 36.

Due to the presence of large buildings, portions of the site beneath these buildings were not sampled. Due to the pattern of historical contamination at the site, uncertainties in the investigation and risk assessment exist. Construction activities within existing parcels are common and could uncover previously unidentified contamination. Thus, measures are warranted to monitor ongoing construction activity and take additional investigation and remedial actions if the contamination exceeds levels of concern.

### **Deep Soil and NAPL**

Groundwater beneath the site is classified by the State of California as a potential municipal supply beneficial use, and groundwater in deep aquifers is currently used by the Water Replenishment District of Southern California to supply drinking water to as many as 3.8 million people in southern California, although the nearest extraction wells are approximately 2 miles downgradient. According to the groundwater risk assessment performed in 1997, the groundwater would pose an extreme risk if used. The principal threat of a continued source of contamination from the Del Amo Site to the groundwater is the NAPL and deep soil contamination, which continues to slowly dissolve into the groundwater. EPA considers the principal threats to the groundwater to be actionable. EPA identified 4 groundwater contamination source areas ("source areas") that warrant remedial action. The term "source area" will be used to identify the groundwater contamination source areas (in the deep soil), whereas the term "areas" will be used to identify the shallow soil areas.

Cleanup of the groundwater plume is being addressed under the Dual Site Groundwater OU (OU3). Pursuant to the Groundwater ROD (EPA, 1999b), the objective of NAPL remedial alternatives for the Del Amo Site Soil and NAPL OU (i.e., this ROD) with respect to groundwater is not to achieve a numeric cleanup standard, but to reduce the amount of NAPL and deep soil contamination in source areas and thus minimize effects of those source areas on the surrounding groundwater. This OU1 ROD amends the OU3 ROD to address this objective.

The response action selected in this ROD is necessary to protect the public health and welfare and the environment from actual or threatened releases of hazardous substances, pollutants or contaminants into the environment which may present an imminent and substantial endangerment.



## 8.0 Remedial Action Objectives

The remediation objectives are to:

- Prevent human exposure through direct contact, ingestion, or inhalation of outdoor shallow soil contaminated above levels for commercial land use or construction activities.

This objective was established to protect property users from potential exposure to contaminants in the shallow soil that exceed the established risk-based level. The current and reasonably anticipated land use is commercial activity.

The three response actions addressing outdoor shallow soil will reduce the potential risk to acceptable levels by removal, treatment, or containment.

- Prevent inhalation of VOCs in indoor air above levels for commercial land use.

This objective was established to protect building occupants from potential exposure to contaminants that may infiltrate from the shallow soil into buildings at levels that exceed the established risk-based level. The current and reasonably anticipated land use is commercial activity.

The two response actions addressing indoor air will reduce the potential risk to acceptable levels by contaminant removal or control of building systems.

- Prevent utilization of impacted groundwater and groundwater in adjacent areas.

This objective derives from the Groundwater ROD that is being amended by this ROD. The objective was established to prevent potential exposure to contaminants in the groundwater that exceed the drinking water standards.

ICs will prohibit property owners from installing or utilizing wells above MCLs.

- Protect the groundwater outside the impacted areas by removing NAPL to limit migration to, or contact with groundwater.

This objective also derives from the Groundwater ROD, being amended by this ROD. The objective was established to prevent the groundwater contamination sources from impacting soil and groundwater that has not been contaminated by removing NAPL and reducing the amount of free phase NAPL on the rising water which becomes trapped in the saturated zone. There is significant uncertainty regarding the lateral and vertical stability of the impacted groundwater. The NAPL has migrated laterally and dissolved phase benzene has migrated laterally and vertically.

Removing NAPL will reduce the source of the groundwater contamination and potentially decrease the ultimate length of time it takes to achieve cleanup standards.



## 9.0 Description of Alternatives

In the Feasibility Study (URS, 2010), technologies were screened and a range of remedial alternatives were assembled and evaluated. These alternatives are listed below and described in detail in the following sections.

### Alternative 1

- No Action

### Alternative 2

- Institutional Controls (informational outreach, building permit review)
- **Future Redevelopment and Construction:** Excavation, Building Engineering Controls, Cap, or SVE

### Alternative 3

- Institutional Controls (informational outreach, building permit review, General Plan footnote, restrictive covenants)
- **Shallow Outdoor Soil:** Cap VOC and non-VOC areas
- **Shallow Soil Beneath Buildings:** Building Engineering Controls
- **Groundwater Contamination Source Areas:** Soil Vapor Extraction and Hydraulic Extraction
- **Future Redevelopment and Construction Contingencies:** Excavation, Building Engineering Controls, Cap, or SVE

### Alternative 4

- Institutional Controls (informational outreach, building permit review, General Plan footnote, restrictive covenants)
- **Shallow Outdoor Soil:** Cap Non-VOC areas, Soil Vapor Extraction for VOC areas
- **Shallow Soil Beneath Buildings:** Building Engineering Controls, Soil Vapor Extraction
- **Groundwater Contamination Source Areas:** Soil Vapor Extraction, In-Situ Chemical Oxidation
- **Future Redevelopment and Construction Contingencies:** Excavation, Building Engineering Controls, Cap, or SVE

### Alternative 5

- Institutional Controls (informational outreach, building permit review, General Plan footnote, restrictive covenants)
- **Shallow Outdoor Soil:** Excavate both VOC and Non-VOC areas
- **Shallow Soil Beneath Buildings:** Soil Vapor Extraction
- **Groundwater Contamination Source Areas:** In-Situ Soil Heating, Soil Vapor Extraction
- **Future Redevelopment and Construction Contingencies:** Excavation, Building Engineering Controls, Cap, or SVE

The alternatives are shown on Figure 9-1). The alternatives are organized by the type of media they apply to: shallow soil outdoors, shallow soil beneath buildings, or groundwater contamination source areas.<sup>5</sup> Table 9-1 presents the cost, time to construct, and operational period to meet remedial action objective (RAOs).

<sup>5</sup> The remedial alternatives were evaluated in the FS for individual EAPCs. For the purposes of the Proposed Plan and ROD the alternatives have been combined to apply to similar areas site-wide. Estimates of volumes, time, etc. apply to all EAPCs for a particular type of remedial action.



Future contingencies pertain to areas encountered in the future during construction activities performed by property owners or tenants where Site-related contamination exceeds EPA's risk-based levels.

**TABLE 9-1: Comparison of Alternatives**

Alternative	Est. Capital Cost	Est. Annual O&M Cost	Est. Present Worth Cost	Est. Construction Time Frame	Operation
Alternative 1	\$0	\$0	\$0	--	--
Alternative 2	\$375,200	\$145,725	\$3,886,000	1 year	--
Alternative 3	\$12,438,000	\$4,260,000 <sup>1</sup>	\$49,380,000	1 year	10 years
Alternative 4	\$10,043,000	\$7,503,000 <sup>2</sup>	\$52,504,000	1 year	3-4 years
Alternative 5	\$35,830,000	\$11,770,000 <sup>3</sup>	\$81,670,000	1 year	3-4 years

**Notes**

Discount Rate of 5% used for Net Present Worth

Net Present Worth based on 100 year implementation of ICs

1 Operations and maintenance (O&M) costs for Alt3 are \$4,260,000 (year 1 to year 4), \$2,220,000 (year 5 to year 10), and \$380,000 (year 11 onward)

2 O&M costs for Alt4 are \$7,503,000 (year 1 to year 3 or 4) and \$319,000 (year 5 onward)

3 O&M costs for Alt5 are \$11,770,000 (year 1 to year 3 or 4) and \$150,000 (year 5 onward)

**9.1 Alternative 1: No Action**

Under this alternative, no action would be taken. No remediation or monitoring of contaminated media would occur, and no institutional controls would be implemented. This alternative satisfies the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requirement for inclusion of a no-action or no-further-action alternative among the options considered. Alternative 1 would neither reduce any site-related surface risk nor prevent deep soil contamination or NAPL from continuing to threaten groundwater. There would be no cost for Alternative 1. This alternative would not comply with the Applicable or Relevant and Appropriate Requirement (ARAR), particularly regarding restrictions for properties where waste is left in place above an unrestricted use/unrestricted exposure level.

**9.2 Alternative 2: Institutional Controls, Future Contingencies****Institutional Control Components**

The building permit review IC, which is currently active as a pilot program, would be instituted in all areas of the site. As building permit applications are reviewed by the City of Los Angeles Building and Safety Department, applicants would be referred to the site Environmental Review Team (ERT) to review construction plans and determine whether contaminated soil or groundwater would be encountered. EPA would then require additional sampling and remedial activities if needed.

The Building Permit Review IC has two components: referral and environmental review. EPA already worked with the Los Angeles Planning Department as a feasibility study pilot to place alert "flags" in its internet-accessible zoning database system, known as Zoning Information and Map Access System (ZIMAS). Flags alert City staff and applicants of special conditions or restrictions that apply to a specific parcel. EPA's flag, placed on all the parcels within the former plant property, informs the user that the parcel is located on a Superfund site and that they need to contact EPA's project team for an environmental review. Thus the applicant is referred to EPA's project team, and the environmental review is initiated.

EPA's project team, called the Environmental Review Team (ERT), is currently composed of EPA, DTSC and the AOC Respondents. Pursuant to the pilot program, the AOC Respondents serve as the point of contact for permit applicants. Upon contact, the AOC Respondents conduct an initial review by obtaining information from the applicant regarding the nature of the proposed project, proposed land use, and locations and depths of excavations. If the proposed project involves soil penetration deeper than 18 inches bgs<sup>6</sup> or a change in land use is proposed, the AOC Respondents prepare a Screening Evaluation Summary Report (SESR), which includes the following information:

- A summary of the proposed project
- A summary of the risk information for the parcel (from the BRA and FS)
- A map of past sampling locations on the parcel, historical rubber plant facilities, and proposed excavations and construction activities
- A data summary table including the laboratory analytical results for each sampling location on the parcel, highlighting any concentrations exceeding regulatory screening criteria
- A summary of recommendations for further action, as appropriate. Recommendations could include additional sampling and risk assessment

Following review and approval of the SESR, EPA issues a letter to the applicant that either (1) specifies actions to be taken prior to or during the construction process that are necessary to protect human health and the environment; or (2) states that the project can proceed without further evaluation. If further action is required, the ERT will thereafter work with the applicant to either establish that there will be no unacceptable health risk to construction workers and tenants, or to remediate the impacted materials until the risks have been reduced to an acceptable level. This process used as a pilot project will remain the same for this remedy.

A variety of informational outreach methods would be used to inform owners, occupants, and the public about the environmental condition of all areas or parcels, including mailings, public registries, and a website.

#### **Treatment/Containment Components**

No treatment or containment components are included in Alternative 2 for known areas with contamination exceeding acceptable risk. However, for contamination encountered in the future in shallow soil, either outdoors or beneath a building, that exceeds action levels, Alternative 2 includes physical treatment. Action levels are described further in Section 12.2, Description of Selected Remedy. These areas would most likely be identified via the building permit review IC. If additional areas of contamination are found that exceed action levels, the remedy will be excavation, clean backfill, and off-site treatment/disposal/recycling.

If contamination is encountered beneath existing structures such that it is impractical to excavate, then building engineering controls (BECs) would be implemented. BECs are control measures applied to buildings to prevent contaminated vapors from building up inside the building and causing health concerns. Examples of the types of BECs that may be applied include but are not limited to building pressurization, sub-slab venting, floor sealing, passive vapor barriers, or modification of the heating,

<sup>6</sup> The 18 inch depth was selected as the depth of concern that would initiate a SESR because the Site had been graded and base material imported during redevelopment. Thus, the native soil that has the potential for containing site-related contamination would not be encountered shallower than 18 inches bgs.

ventilating, and air conditioning (HVAC) system. The type of BECs implemented would be determined by EPA on a case-by-case basis.

**FIGURE 9-1  
Summary of Remedial Alternatives**

**Soil and NAPL ROD  
Del Amo Superfund Site**

Medium	Alternative 1	Alternative 2	Alternative 3	Alternative 4 (EPA's Preferred Alternative)	Alternative 5
Outdoor Shallow Soil	No Action	Institutional Controls: - Building Permit review {ALL AREAS}	- Building Permit review - Zoning - Restrictive Covenant {26 AREAS}	- Building Permit review - Zoning - Restrictive Covenant {26 AREAS}	- Building Permit review - Zoning - Restrictive Covenant {26 AREAS}
			Cap (VOC and non-VOC contaminants) {7 AREAS}	(non-VOC contaminants) {4 AREAS}	Excavation (VOC and non-VOC contaminants) {7 AREAS}
				SVE (VOC contaminants) {3 AREAS}	
Outdoor Shallow Soil Future Unknown Areas		Excavation {FUTURE AREAS} <i>IF contamination is beneath building and excavation is infeasible, then: building engineering controls. IF other interference makes excavation impractical, then: SVE(for VOCs) and capping (for non-VOCs).</i> {FUTURE AREAS}			
Shallow Soil Beneath Buildings			Building Engineering Controls {2 AREAS}	{1 AREA}	
				SVE {1 AREA}	{2 AREAS}
NAPL/ Groundwater Contamination Source Areas			SVE {4 AREAS}	{4 AREAS}	{4 AREAS}
			Hydraulic Extraction {4 AREAS}	In-situ Chemical Oxidation {3 AREAS}	In-situ Soil Heating {3 AREAS}

If the new areas of contamination have other structures or infrastructure that would interfere with excavation making it impractical, then SVE (for VOCs) and capping (for non-VOCs) will be utilized. SVE is a common technology to remediate volatile organic compounds in the soil, in which vacuum wells are inserted into the ground to pull out contaminated vapors until target levels in the soil are achieved. The extracted vapors are treated using air pollution control technology on-site to meet air pollution emission requirements. Capping consists of covering contaminated soil to prevent exposure. The cover materials would consist of existing or new asphalt, concrete, building structures, or clean landscaping soils. These covers would be surveyed, inspected, repaired, and enhanced as needed to meet the RAOs.

If any contamination is left in place in the additional contamination areas ICs will be required in the form of restrictive covenant to prohibit interference with the physical remedy components, and to restrict contact with any contamination left in place above action levels.

### **Monitoring Components**

Periodic monitoring of the individual ICs would be performed to confirm they are operating effectively over time. Specific monitoring activities would include using Underground Services Alert and land-activity monitoring services to know when permits are issued, property is sold, zoning changes are proposed, land use permits are proposed or issued, and excavations in public rights-of-way are planned. Periodic visual inspections would also occur. ICs would be monitored in perpetuity to ensure effectiveness.

Monitoring associated with excavation would include collection of confirmation samples to confirm that the excavation has removed the contaminated soil. Ambient air monitoring would be conducted during the excavation to confirm there are no contaminant air emissions above regulatory standards (described further in Section 12.2, Description of Selected Remedy. BECs would be monitored as long as the soil contamination remains above the action level. Monitoring activities for BECs would include indoor air monitoring and could include sub-slab vapor monitoring. SVE requires periodic treatment system monitoring for compliance and evaluation of performance, as well as monitoring of vapor wells, until soil contamination is reduced to below target levels (described further in Section 12.2. Capping will require long-term monitoring of the cap integrity.

### **Operation and Maintenance Components**

Operations and maintenance (O&M) activities for SVE include upkeep of the extraction systems, mechanical components, pipeline maintenance, well maintenance, and reporting. O&M activities for BECs will depend on the type of BEC implemented, but may include inspection of subslab or HVAC systems, sampling of indoor air or subslab vapors, and pressure measurements. O&M activities related to capping include periodic long-term inspection, maintenance, and repair. O&M activities for ICs consist of administrative oversight of the IC mechanism and periodic inspections.

### **Expected Outcomes**

Implementation of Alternative 2 would prevent exposure of commercial workers to the contaminated soil through ICs. However, source contamination would be left in place and Alternative 2 would not prohibit residential use. Some reduction of contamination left in place would be expected over time through intrinsic biodegradation of the organic contaminants. The excavation or SVE remedies for potential additional areas encountered in the future would remove or reduce source contamination in shallow soil to below target levels.

**9.3 Alternative 3: Cap, Building Engineering Controls, SVE & Hydraulic Extraction, Institutional Controls, Future Contingencies**

**Institutional Control Components**

IC components include building permit review and informational outreach applied to all areas, as in Alternative 2. ICs for Alternative 3 also include a General Plan footnote and restrictive covenants.

A General Plan documents the existing zoning rules for the City of Los Angeles that specify allowable land uses in designated areas. The City’s General Plan does not currently allow residential use of the Del Amo Site. EPA would work with the City to place a footnote in the General Plan that informs readers about the Superfund site, stating that it is not safe for future residential use if the zoning changed.

Restrictive covenants are legal agreements between a property owner and the State of California whereby restrictions are placed on the use of the property. State law requires these covenants be placed on property wherever contamination is left in place above a level that is safe for unrestricted use. They are implemented pursuant to California Civil Code 1471 and DTSC regulations. These covenants would “run with the land,” meaning they remain with the properties through changes in ownership.

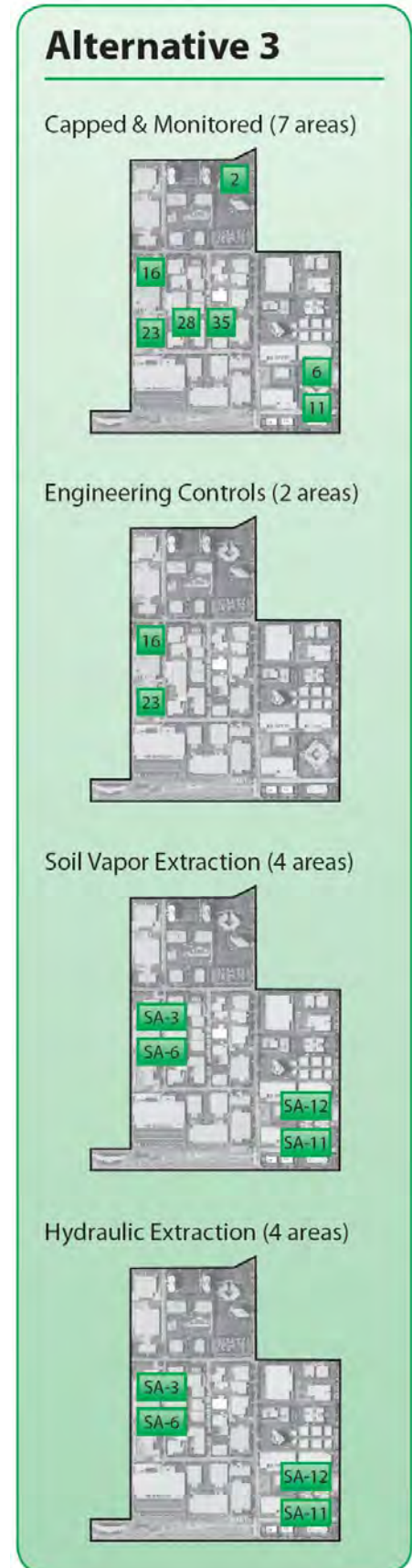
The covenants would prevent residential or other sensitive uses of the land, require consultation with and approval by the EPA for any construction plans, and prohibit interference with any physical remedy components. The covenants for areas overlying groundwater contamination would have a provision that prohibits drilling into, and use of, groundwater.

The General Plan footnote and restrictive covenants would be instituted in 26 areas, including Areas 2, 4–17, 19, 20, 22–24, 28, 30, 32, 33, 35, and 36. The covenants for areas overlying groundwater contamination that would contain that additional provision includes Areas 4–6, 8, 9, 11, 15–17, 19, 20, 22–24, 28, 32, 33, and 35.

**Treatment/Containment Components**

Alternative 3 also applies treatment and containment technologies. Containment components include capping VOC- and non-VOC-impacted shallow outdoor soil at seven areas and implementing BECs at two areas. The BECs would address potential vapor intrusion related to shallow VOC-impacted soil beneath the buildings. Treatment components include SVE of VOCs in groundwater contamination source areas and hydraulic extraction to address dissolved VOCs in groundwater from LNAPL.

Capping would occur in seven separate areas (Areas 2, 6, 11, 16, 23, 28, and 35) where VOC and non-VOC contamination exceeds action



levels. This would cover approximately 418,000 sf. The areas would be capped with asphalt, concrete, or clean soil. Each of the areas already has asphalt, concrete, or clean landscaping soil covers, which would remain and be monitored and maintained. A slurry seal would be applied over the existing asphalt, if needed, to establish effectiveness.

The two buildings that would have engineering controls are in Areas 16 and 23. BECs are described in Alternative 2.

SVE would be used over an area of approximately 155,900 sf, to remove VOCs from vadose soil in four separate groundwater contamination source areas ( SA-3, SA-6, SA-11, and SA-12). SVE is also described in Alternative 2. The number of wells would be determined during RD. Preliminary design assumptions include 12 SVE wells at SA-3, 9 wells at SA-6, 9 wells at SA-11, and 6 wells at SA-12. Potential methods of removing contaminants from the air stream include adsorption, condensation, thermal oxidation, and internal combustion. The technology or combination of technologies will be determined in the RD process.

Hydraulic extraction would be used over an area of approximately 155,900 sf, to remove contaminants dissolved in the groundwater in four separate groundwater contamination source areas (SA-3, SA-6, SA-11, and SA-12). Hydraulic extraction consists of installing wells into the groundwater within the NAPL/soil contamination area and pumping out contaminated water. As the groundwater is drawn into the wells, any NAPL that was floating on the water, as well as any contamination that had dissolved into the groundwater, would be drawn in and extracted. The extracted water will be treated to remove the contaminants before being discharged.

The number of hydraulic extraction wells would be determined during RD. Preliminary design assumptions include 56 groundwater extraction wells screened from 50 to 90 feet bgs at SA-3, 42 wells screened from 50 to 80 feet bgs at SA-6, 45 wells screened from 40 to 80 feet bgs at SA-11, and 24 wells screened from 40 to 80 feet bgs at SA-12. Costs assume that extracted groundwater will be treated using an oil-water separator, high pressure oxidation, and air stripping, with a granular activated carbon polish. Costs also assume that the treated water would be discharged to the storm drain under a National Pollutant Discharge Elimination System permit.

If additional areas of Site-related contamination are encountered, the remedies will be the same as in Alternative 2, consisting of excavation, BECs, SVE or capping.

Prior to implementing an active remedial alternative such as SVE or hydraulic extraction, additional sampling would be performed to confirm the extent of contamination requiring remediation.

### **Monitoring Components**

Monitoring components for ICs, capping, BECs and SVE are the same as those described in Alternative 2. The IC and remedial system monitoring would continue in perpetuity to ensure effectiveness. The restrictive covenant would contain a provision to ensure the remedial systems are not disturbed while in operation.

Construction of the SVE and hydraulic extraction systems is expected to be completed in one year. SVE is expected to operate for four years, and hydraulic extraction for 10 years. Regular sampling and monitoring of influent, effluent, and air emissions would be performed during operation.

Long-term groundwater monitoring would be used to ensure containment and evaluate NAPL treatment system effectiveness and changes in remaining NAPL or dissolved-phase contaminant distributions after remedial action.

**Operation and Maintenance Components**

O&M components for SVE systems, BEC systems, and ICs are described in Alternative 2. Alternative 3 includes hydraulic extraction, which would require O&M during the 10 years of operation. O&M components for hydraulic extraction are similar to SVE, including regular inspection and maintenance of the wells, wellheads, piping connections, and treatment system.

**Expected Outcomes**

Implementation of Alternative 3 would prevent exposure to contaminated groundwater and soil through ICs, BECs, and capping. Shallow soil contamination would be left in place. Some reduction of contamination left in place would be expected over time, through intrinsic biodegradation of the organic contaminants. SVE and hydraulic extraction would be used to reduce the LNAPL and soil contamination that contribute to groundwater contamination. The FS estimates a reduction of approximately 40 to 50 percent of NAPL contaminant mass. In any additional areas of Site-related contamination encountered in the future, the excavation or SVE remedies would be expected to remove or reduce source contamination in shallow soil to below target levels.

**9.4 Alternative 4: Institutional Controls, Capping, Shallow Soil SVE, Building Engineering Controls, SVE Beneath Building, Deep Soil SVE & In-Situ Chemical Oxidation, Future Contingencies**

**Institutional Control Components**

ICs would be used in the same manner as Alternative 3.

If during the course of conducting building permit reviews for future construction projects and conducting subsequent sampling, new contamination is discovered, the contingency remedy will be the same as in Alternative 2, consisting of excavation, BECs, SVE, or capping.


**Treatment/Containment Components**

This alternative also applies treatment and containment technologies. Containment components include capping non-VOC-impacted shallow outdoor soil at four areas and implementing BECs at one area. Treatment components include SVE of VOCs in outdoor shallow soil at three areas, SVE of shallow soil under buildings at one area, and SVE and ISCO in the groundwater contamination source areas. ISCO would address dissolved VOCs in groundwater from LNAPL at or below the water table. As in Alternatives 2 and 3, a combination of excavation, BECs, capping, and SVE would be implemented in shallow soil as future contingencies.


Capping would occur in the same manner as Alternative 3 but would

## Alternative 4


Capped & Monitored (4 areas)




Engineering Controls (1 area)



Soil Vapor Extraction (4 Areas)



SVE and In-Situ Chemical Oxidation (3 areas)





only occur in four areas (Areas 2, 16, 28, and 35). This would cover approximately 288,000 sf.

SVE in shallow soil would occur in much the same manner as described in Alternative 3 for the deep soil. It would be used over an area of approximately 130,000 sf in three separate areas (Areas 6, 11, and 23). The number of wells would be determined during RD. Preliminary design assumptions include 35 SVE wells screened from 5 to 15 feet bgs at Area 6, eight SVE wells screened from 5 to 15 feet bgs at Area 11, and 41 wells screened from 5 to 15 feet bgs at Area 23.

In Alternative 4, BECs would be implemented at one building in Area 16, in the same manner as Alternative 3. SVE would be implemented beneath the building at Area 23.

SVE would be used in the same groundwater contamination source areas and in the same manner as Alternative 3.

ISCO would be used instead of hydraulic extraction over an area of approximately 113,900 sf to oxidize (chemically break down) the NAPL/soil contamination in the groundwater, converting it into carbon dioxide and water. This chemical reaction could also release heat, which would vaporize additional contamination above the groundwater. Therefore the SVE system is used to capture these vaporized contaminants. Oxygen is also created during this chemical reaction, which promotes natural biodegradation. ISCO would be implemented in three separate areas: SA-3, SA-11, and SA-12.

The number of wells used, whether permanent wells or temporary direct-push injection points are used, the timing of oxidant injections, and the type of oxidant used would be determined during RD. Preliminary design assumptions include Fenton's reagent as the oxidant, injections occurring semi-annually, and direct- push temporary injection points being used on 15 foot spacing.

If additional areas of Site-related contamination are encountered, the remedies will be the same as in Alternative 2, consisting of excavation, BECs, SVE or capping.

Prior to implementing an active remedial alternative such as SVE or ISCO, additional soil and/or groundwater sampling would be performed to verify the extent of contamination benefitting from remediation.

### **Monitoring Components**

Monitoring components for ICs, capping, BECs, and SVE in shallow soil are similar to those described in Alternative 2.

SVE systems implemented to address shallow soil are expected to operate for 3 years. Regular sampling and monitoring of treatment system influent, effluent, and air emissions would be performed during operation.

ISCO injections are expected to continue for at least 4 years or until performance criteria indicate the treatments are no longer needed. SVE for the deep soil is also expected to operate at least until the ISCO treatments are suspended. Regular sampling and monitoring of treatment system influent, effluent, baseline and temporal benzene concentrations, plume dispersion, breakdown product concentrations in soil and groundwater, and air emissions would be performed during operation. Soil and groundwater sampling would be performed to monitor mass reduction, mass remaining, and the performance and effectiveness of the ISCO remedy.

Long-term monitoring of the groundwater would also occur, as in Alternative 3. Groundwater monitoring results will be used for a baseline analysis, mass reduction breakdown product analysis, mass

remaining measurements, water quality parameter measurement, biological conditions and unanticipated/adverse changes in NAPL or dissolved-phase contaminant distributions in the long-term.

The ICs and remedial systems would be monitored in perpetuity or until cleanup is complete (for remedial systems) to ensure effectiveness. The restrictive covenant IC would contain a provision to ensure the remedial systems are not disturbed while in operation.

### Operation and Maintenance Components

O&M components for SVE systems, BEC systems, caps, and ICs are described in Alternative 2. There are no O&M requirements associated with ISCO, only with the companion SVE systems.

### Expected Outcomes

Implementation of Alternative 4 would prevent exposure to contaminated groundwater and soil through ICs, BECs and capping. After three years SVE would be expected to reduce shallow soil contamination to below target levels.

ISCO and SVE would reduce the LNAPL and soil contamination that contribute to groundwater contamination. The FS estimates a reduction of approximately 40 to 50 percent of contaminant mass after four years.

In any additional areas of Site-related contamination encountered in the future, the excavation or SVE remedies would be expected to remove or reduce source contamination in shallow soil to below target levels.

## 9.5 Alternative 5: Institutional Controls, Excavation, SVE Beneath Building, Deep Soil SVE & In-Situ Soil Heating, Informational Outreach, Future Contingencies

### Institutional Control Components

ICs would be used in the same manner as Alternative 3.

If during the course of conducting building permit reviews for future construction projects and conducting subsequent sampling, EPA discovers new contamination areas, the contingency remedy will be the same as in Alternative 2, consisting of excavation, BECs, SVE, or capping.

### Treatment/Containment Components

This alternative also applies treatment technologies. Treatment components include excavation of shallow outdoor soil contamination, SVE of shallow soil under buildings at two areas, and SVE and in-situ soil heating (ISSH) in the groundwater contamination source areas. As in Alternatives 2, 3, and 4, a combination of excavation, BECs, and SVE would be implemented in shallow soil as future contingencies.

Excavation would occur in seven separate areas where VOC and non-VOC contamination exceeds action levels. This would include

## Alternative 5

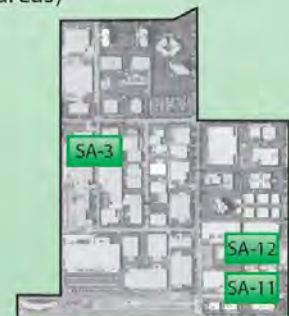
Excavate Contaminated Soil  
(7 areas)



Soil Vapor Extraction (3 Areas)



SVE and In-Situ Soil Heating  
(3 areas)



approximately 69,530 cubic yards (CY) of soil. They would be excavated to depths ranging from 5 to 15 feet bgs, and transported off-site to a permitted treatment and/or disposal facility. The areas include Areas 2, 6, 11, 16, 23, 28, and 35.

Two buildings in Areas 16 and 23 would have SVE implemented in the soil beneath them.

SVE would be used in the same groundwater contamination source areas and in the same manner as Alternative 3.

ISSH would be used over an area of approximately 155,900 sf to volatilize the NAPL/soil contamination in the groundwater and vadose zone and push it into the SVE system in the vadose zone, where it would be captured and removed. This would be implemented in three separate areas: SA-3, SA-11, and SA-12.

ISSH consists of heating the sub-surface soil to volatilize the contamination, then capturing the vapors in a SVE system. The soil is heated both above the groundwater and within the groundwater. Soil heating can be done either by heating up wells in the treatment area (thermal conduction heating), running electricity through the soil between wells (electrical resistance heating), or by injecting steam into the soil (steam injection heating). After the vapors are extracted, the treatment system would include condensation, phase separation, and vapor treatment. If steam heating is used, the condensed steam would be treated using advanced oxidation and carbon adsorption. The treated water would be discharged to the storm drain or, if the volume is small enough, it could be transported off-site for appropriate disposal.

Final design parameters for ISSH will be determined during RD. The preliminary design in the FS assumes electrical resistance heating (ERH) treatment for 2 years. Assumptions include 132 electrode SVE wells at SA-3, 99 electrode SVE wells at SA-11, and 53 electrode SVE wells at SA-12.

If additional areas of Site-related contamination are encountered, the remedies will be the same as in Alternative 2, consisting of excavation, BECs, SVE or capping.

Prior to implementing an active remedial alternative such as excavation, SVE or ISSH, additional sampling would be performed to confirm the extent of contamination requiring remediation.

### **Monitoring Components**

Monitoring components for ICs, excavation and SVE in shallow soil are similar to those described in Alternative 2. ICs would be monitored in perpetuity to ensure effectiveness. The restrictive covenant IC would contain a provision to ensure the remedial systems are not disturbed while in operation.

SVE systems implemented to address shallow soil beneath buildings are expected to operate for 3 years. Regular sampling and monitoring of treatment system influent, effluent, and air emissions would be performed during operation.

ISSH is expected to continue for four years. SVE is also expected to operate for 4 years. Performance monitoring would be conducted during ISSH operation. Regular sampling and monitoring of SVE treatment system influent, effluent, and air emissions would be performed during operation.

Groundwater monitoring results will indicate unanticipated/adverse changes in NAPL or dissolved-phase contaminant distributions in the long-term. Groundwater monitoring would be conducted during any active remedial system operation, to confirm remedy effectiveness in the vicinity of a source area. Long-term monitoring of the groundwater would also occur, as in Alternative 3.

### **Operation and Maintenance Components**

O&M components for SVE systems are described in Alternative 2. Alternative 5 includes ISSH, which will require O&M during the 4 years of operation. O&M components for ISSH include regular inspection and maintenance of the wells, piping connections, electrical systems and treatment enclosures.

**Expected Outcomes**

Implementation of Alternative 5 would prevent exposure to contaminated groundwater and soil through ICs. Excavation would permanently remove contaminated shallow soil exceeding action levels. After 3 years, SVE would be expected to reduce shallow soil contamination to below target levels.

ISSH and SVE would reduce the LNAPL and soil contamination that contribute to groundwater contamination. A reduction of approximately 60 to 90 percent of contaminant mass is expected after 4 years.

In any additional areas of Site-related contamination encountered in the future, the excavation or SVE remedies would be expected to remove or reduce source contamination in shallow soil to below target levels.

## 10.0 Comparative Analysis of Alternatives

This section compares the alternatives against nine evaluation criteria specified by the NCP (section 300.430). Two of the nine criteria are considered threshold criteria: (1) overall protection of human health and the environment, and (2) compliance with ARARs. If an alternative does not meet these two threshold criteria, it cannot be selected as the remedy. Five of the criteria are considered balancing criteria: (1) long-term effectiveness and permanence, (2) reduction of toxicity, mobility, or volume of contaminants through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. Two of the criteria are considered modifying criteria: (1) state agency acceptance, and (2) community acceptance. The modifying criteria are also considered in the remedy selection.

Each alternative consists of three components: (1) shallow outdoor soil, (2) shallow soil beneath buildings, and (3) NAPL/groundwater source areas. During the FS, a detailed evaluation of the alternatives for each component was conducted using the nine criteria. The FS then included a comparative analysis for each component, showing the relative performance of each alternative. The comparative analysis described below combines the evaluations for the three components.

### 10.1 Overall Protection of Human Health and the Environment

This criterion determines whether an alternative adequately eliminates, reduces, or controls threats to human health and the environment through ICs, BECs, or treatment.

#### Outdoor Shallow Soil Component

All the outdoor shallow soil alternatives except No Action (Alternative 1) are protective of human health and the environment for the intended land use. For the outdoor shallow soil component, the capping actions (Alternatives 3 and 4) would be protective because capping physically covers the contaminated soil and prevents exposure to anyone using the property. The SVE approach (Alternative 4) would be protective because it would reduce the VOC contamination in the shallow soil to levels that would no longer present an unacceptable hazard. The excavation actions (Alternative 5) would be protective because excavation physically removes the contaminated soil of concern from the site. The ICs (Alternative 2) are protective because they would inform owners and occupants about the contamination left in place and have them work with the ERT if they conduct invasive activities that could disturb the soil. This would prevent inadvertent exposures in the future. Note that the ICs are also associated with Alternatives 3, 4, and 5.

#### Shallow Soil Beneath Buildings Component

For shallow soil beneath the buildings, the "BEC" (Alternative 3 and Alternative 4) and the SVE (Alternative 4 and Alternative 5) alternatives would be protective of human health and the environment, but the ICs (Alternative 2) and the No Action (Alternative 1) alternatives would not be. "Building engineering controls" (Alternative 3 and Alternative 4) would be protective because they prevent contamination in the underlying soil from reaching building occupants. The SVE approach (Alternative 4 and Alternative 5) would be protective because it would reduce the VOC contamination in the shallow soil beneath the building to acceptable levels. Alternatives 3, 4, and 5 all include ICs, which would increase protectiveness by informing owners and occupants about the contamination left in place and have them work with the ERT whenever they conduct any invasive activities that could disturb the soil. This would help prevent inadvertent exposure to contaminated soil in the future.

### **NAPL/Groundwater Contamination Source Area Component**

For the NAPL/groundwater contamination source areas, ICs alternative (Alternative 2) would be protective because it would inform owners or developers about the contamination and refer them to EPA for review of their activities on the property that could result in exposure to either the deep soil or the contaminated groundwater. The other alternatives would be more protective because they not only use ICs to prevent exposures but also actively remove some contaminant mass. Mass is removed in the alternatives via SVE (Alternative 3, Alternative 4, Alternative 5), hydraulic extraction (Alternative 3), chemical oxidation (Alternative 4), and soil heating (Alternative 5). This reduces the principal threat waste (See Section 11) that is acting as the source of contamination to the groundwater and in some cases, to the ground surface.

### **10.2 Compliance with Applicable or Relevant and Appropriate Requirements**

This criterion evaluates whether the alternative meets the applicable or relevant and appropriate requirements of other federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminants, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be considered to be relevant and appropriate.

Alternatives 3, 4 and 5 would comply with federal and state applicable or relevant and appropriate requirements, but the Alternative 1 (No Action) and Alternative 2 (ICs only) would not. Alternative 1 would not provide the restrictive covenant IC as required by State regulations when wastes are left in place above an unrestricted use level. Alternative 2 would provides the informational IC and the permit review IC but not the required restrictive covenant IC. Thus, Alternative 2 would not comply with all ARARs. The other alternatives (3, 4 and 5) would comply with the state rule requiring restrictive covenants. The SVE alternatives (shallow outdoor soil Alternative 4, beneath buildings Alternatives 4 and 5, NAPL/groundwater source Alternatives 4 and 5) would comply with air treatment and emission requirements applicable to the vapor treatment system. The SVE alternatives would also comply with regulations for handling and disposing of hazardous wastes generated. The hydraulic extraction alternative (NAPL/groundwater source Alternative 3) would comply with wastewater discharge requirements. No chemical specific ARARs were identified for the groundwater, and the Groundwater ROD had waived drinking water standards as being technically impracticable to achieve. ARARs affecting the active treatment components are limited to action-specific ARARs pertinent to air emissions, wastewater discharge, and waste and hazardous material handling.

### 10.3 Long-term Effectiveness and Permanence

This criterion considers expected residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time, once the cleanup levels have been met. This includes the adequacy and reliability of controls.

#### Outdoor Shallow Soil Component

The excavation (Alternative 5) and SVE (Alternative 4) alternatives would provide the best long-term effectiveness and permanence because they would remove the contaminants of concern from the Site. Capping with SVE and ICs (Alternative 4) is the next best alternative because it removes and treats some of the contaminants (the VOCs), with the remainder (non-VOCs) being capped in place. Capping creates a physical barrier to prevent contaminant exposure, which is effective with required maintenance. Capping alone (Alternative 3) is less effective and permanent than capping combined with SVE. ICs in concert with the engineered actions serve to enhance protectiveness. ICs alone (Alternative 2) can be effective when they are properly maintained and monitored, although there is inherent uncertainty about maintaining these controls in perpetuity given potential future changes in land use and uncertainty as to whether people will follow them. Both the cap and the ICs require dedicated resources to ensure long-term maintenance and protection.

#### Shallow Soil Beneath Buildings Component

The SVE alternatives (Alternative 4 and Alternative 5) as well as excavation are the most effective and permanent alternatives because the hazardous substances that could impact property occupants would be removed and treated. Excavation is not one of the alternatives for the known contamination areas, but it is an alternative for future areas discovered during development or construction. The "BECs" alternative is effective because it prevents the contaminants from entering the building. However, it is not as permanent as Alternative 4 and Alternative 5 because the hazardous substances are not removed, and there is some uncertainty about the ability to maintain these physical engineering controls in perpetuity. Maintaining such controls in perpetuity requires continued attention and resources. ICs in concert with the other engineered actions serve to enhance their protectiveness. ICs alone (Alternative 2) are not considered effective because they do not prevent the contamination from entering the building.

#### NAPL/Groundwater Contamination Source Areas Component

The most effective alternative in the long term removes the most contaminant mass that acts as a continuing source of pollution to the groundwater. The more contaminant mass removed, the sooner the groundwater would be cleaned up. The alternative that would remove the most mass is soil heating (Alternative 5), followed by chemical oxidation (Alternative 4), then hydraulic extraction (Alternative 3), each of them being accompanied by SVE (and ICs). ICs would be a critical component of the above alternatives because they would ensure protectiveness by preventing exposures to contaminated soil and groundwater, while the groundwater is undergoing treatment. ICs (Alternative 2) alone would achieve the least permanence because they would not actively remove any contaminant mass or prevent use of groundwater.

### 10.4 Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

This criterion evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.



**Outdoor Shallow Soil Component**

Excavation (Alternative 5) and SVE (Alternative 4 and Alternative 5) alternatives have the best reduction of toxicity, mobility, or volume through treatment. Excavation removes the contaminated soil for off-site treatment, and SVE removes the VOC contaminants from the soil and treats the vapors. Capping (Alternative 3 and Alternative 4) and ICs (Alternative 2) do not reduce the toxicity, mobility, or volume of the contaminants through treatment.

**Shallow Soil Beneath Buildings Component**

The SVE beneath buildings alternatives (Alternative 4 and Alternative 5) as well as excavation would have the greatest reduction of toxicity, mobility, or volume through treatment. Excavation is not an alternative for the known contamination areas, but it is an alternative for future areas discovered during redevelopment or construction. The other alternatives, BECs (Alternative 3) and ICs (Alternative 2), do not use treatment to reduce toxicity, mobility or volume.

**NAPL/Groundwater Contamination Source Area Component**

The soil heating (with SVE) alternative (Alternative 5) would do the most to reduce toxicity, mobility or volume through treatment, followed by chemical oxidation (Alternative 4), and then hydraulic extraction (Alternative 3), each paired with SVE. ICs alone (Alternative 2) would provide no reduction in toxicity, mobility or volume through treatment.

**10.5 Short-term Effectiveness**

This criterion considers the length of time needed to implement an alternative and any adverse impacts the alternative poses to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.

**Outdoor Shallow Soil Component**

Capping is effective in the short-term because the areas of concern are already covered with asphalt, concrete, or landscaping, and enhancing them as needed is a simple construction project. The short-term effectiveness of the SVE alternative is moderate due to possible emissions during construction or system operation. Although the construction and system operations would be engineered and planned to control emissions, short-term vapor releases could occur. The short-term impacts of the excavation alternative would consist of possible dust emissions from the contaminated soil, although best efforts would be taken to control dust emissions. For the ICs, no short-term impacts are expected as long as the existing caps are in place and remain effective at mitigating direct contact exposures, and interim ICs currently in place control exposures during most construction projects that involve excavation in impacted areas.

**Shallow Soil Beneath Buildings Component**

The short-term effectiveness of the "BEC" alternative is good because ventilation systems can be adjusted with relatively little impact on building occupants. However, installing a sub-slab venting system or conducting excavation would have greater impacts on occupants due to dust and possible contaminant off-gassing. Excavation is not an alternative for known contamination areas but is an alternative for future areas discovered during redevelopment or construction. For the SVE alternative, short-term effectiveness is moderate due to possible emissions during construction or system operation. ICs, when used in combination with the BECs or SVE, would not have short-term impacts during implementation because the other components would control exposure within buildings.

**NAPL/Groundwater Contamination Source Area Component**

All treatment alternatives, SVE, hydraulic extraction, chemical oxidation and soil heating have the potential for short-term impacts if releases are not adequately controlled. Heating of the ground could cause vapor migration and the handling of the extracted vapors could experience explosions if not properly designed, constructed, and operated. The injection of chemical oxidants could cause NAPL migration by displacement and emergence of injected chemicals at the surface. The soil heating alternative could have a greater potential short-term impact because it involves handling a greater volume of contaminated media. Generally the more aggressive the alternative the more potential safety issues exist. SVE would have a lesser potential for short-term impacts than chemical oxidation or soil heating.

**10.6 Implementability**

This criterion considers the technical and administrative feasibility of implementing the alternative, from design through construction and operation. Factors such as the relative availability of goods and services, and coordination with other governmental entities are considered.

**Outdoor Shallow Soil Component**

The capping component is expected to be implementable because the areas of concern are already covered with asphalt, concrete, or landscaping. Inspecting, repairing, enhancing, and monitoring them is a routine project. The implementability of the SVE component is moderate because it can be technically challenging to extract soil vapor from the low permeability shallow soil at the Del Amo Site. However, there is proven use of this technology in similar conditions. The implementability of the excavation component is also moderate, with minor technical challenges due to the proximity of the excavations to occupied buildings. If excavation is to be performed beneath a building, in the case of new contamination discovered during future construction projects, then technical challenges would be expected from needing to operate excavation equipment indoors. The informational component of the ICs is highly implementable because there are no impediments to putting site information in public databases and distributing it to owners or occupants. The building permit review IC is most easily implementable because it is already being implemented on a pilot scale. However, there are some implementation challenges regarding the General Plan footnote since that requires approval of the City Council and Planning Commission. Finally, there are implementation challenges for the restrictive covenant IC because these require negotiations with individual property owners.

**Shallow Soil Beneath Buildings Component**

The "BECs" are expected to be implementable, but complicated by the intricacies involved in controlling a building's ventilation system to keep the building pressurized and prevent contaminants from infiltrating the building. It is also complicated to install a venting system beneath the building foundation (if needed) because it requires cutting trenches in the foundation to install the venting pipes. Excavation beneath a building can be implementable depending on the location of the contamination and the type and use of the building. It is considered challenging due to the logistics, including location of the contamination, configuration of the building, occupancy and use of the building, and location of utilities and structural elements. Excavation is not an alternative for known contamination areas beneath buildings, but is an alternative for future areas discovered during redevelopment or construction. The implementation of the SVE system beneath buildings has some uncertainties. It is challenging to install wells horizontally and to monitor a system's performance beneath a building. The implementation issues associated with implementing the ICs for these areas would be the same as those for the shallow soil areas.

**NAPL/Groundwater Contamination Source Area Component**

Implementing the ICs at NAPL/groundwater source areas would be the same as implementing them for the shallow soil areas. The SVE system and the hydraulic extraction system are both readily implementable technically, but there would be some administrative challenges in coordinating the work with operating businesses. Implementation of chemical oxidation is technically feasible, but it could be challenging due to the presence of low permeability soils in some areas. Because a portion of the property would need to be occupied by the injection and treatment systems, careful coordination with the businesses would be required. ISSH is implementable, but there are a limited number of vendors, and implementing this remedial action near active businesses would be challenging. As with chemical oxidation, careful coordination with the business would be required due to the space needed for the remediation system.

**5.4 Cost**

This criterion includes estimated capital and annual O&M costs, which are expressed in terms of present worth. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

The costs for the alternatives are summarized in Table 10-1. In addition, Tables 10-2 and 10-3 present the potential future costs for remediating any additional contamination discovered in the future.

**TABLE 10-1: Costs for Remedial Alternatives**

Alternative		Present Worth Cost
1	No Action	\$0
2	Institutional Controls (building permit review, informational outreach)	\$3,890,000
3	<ul style="list-style-type: none"> <li>– Institutional Controls (building permit review, General Plan footnote, restrictive covenant, informational outreach)</li> <li>– Cap (shallow soil outdoor)</li> <li>– Building Engineering Controls (contamination beneath building)</li> <li>– Hydraulic Extraction and Soil Vapor Extraction (NAPL)</li> </ul>	\$49,380,000
4	<ul style="list-style-type: none"> <li>– Institutional Controls (building permit review, General Plan footnote, restrictive covenant, informational outreach)</li> <li>– Cap and Soil Vapor Extraction (shallow soil outdoor)</li> <li>– Building Engineering Controls and Soil Vapor Extraction (contamination beneath building)</li> <li>– In-Situ Chemical Oxidation and Soil Vapor Extraction (NAPL)</li> </ul>	\$52,500,000
5	<ul style="list-style-type: none"> <li>– Institutional Controls (building permit review, General Plan footnote, restrictive covenant, informational outreach)</li> <li>– Excavation (shallow soil outdoor)</li> <li>– Soil Vapor Extraction (contamination beneath building)</li> <li>– In-Situ Soil Heating and Soil Vapor Extraction (NAPL)</li> </ul>	\$81,670,000

## Notes:

EPA policy indicates that a 7% discount rate typically be used in Present Worth calculations like these. In this case, however, EPA used a 5% discount rate as a more realistic number but also presents in Table 12-5 the costs using both discount rates for comparison purposes.

The cost of the possible future cleanup of any Site-related outdoor shallow soil contamination encountered in the future would depend on how much contaminated soil is encountered. The alternatives for addressing such cases are the same as the alternatives evaluated above for known contamination, including capping, SVE, and excavation, as well as ICs (if not already in place on the parcel). The costs for these alternatives are shown in the table below, based on approximate size of the contaminated area. Table 10-2 defines the sizes of contaminated area that would be considered small, medium, or large. The ICs cost is the cost of implementing a restrictive covenant, if the parcel does not already have one, and is not dependent on size of the contaminated area.

**TABLE 10-2: Costs for Possible Future Remediation – Outdoor Shallow Soil**

Shallow Soil Alternative		Small		Medium		Large	
1	No Action	0		0		0	
2	Institutional Controls restrictive covenant for: – Protecting engineering controls – land use restrictions	\$25,000 per parcel \$32,000 per parcel					
3	Cap	100 sf	\$23,000	625 sf	\$60,000	2,500 sf	\$186,000
4	Soil Vapor Extraction	2,500 sf	\$534,000	10,000 sf	\$880,000	40,000 sf	\$1,825,000
5	Excavation – 5 ft. deep, non-hazardous, no VOC – 15 ft. deep, non-hazardous, VOCs present – 15 ft. deep, mostly hazardous, VOCs present	100 sf	\$42,000	625 sf	\$105,000	2,500 sf	\$257,000
		100 sf	\$150,000	625 sf	\$298,000	2,500 sf	\$663,000
		100 sf	\$182,000	625 sf	\$459,000	2,500 sf	\$1,287,000

The cost of the possible future cleanup of any Site-related shallow soil contamination beneath buildings that is encountered in the future would depend on how much contaminated soil is encountered. The costs are shown in the following table for small, medium or large sized areas.

**TABLE 10-3: Costs for Possible Future Remediation – Beneath Buildings**

Beneath Building Alternative		Small		Medium		Large	
1	No Action						
2	Institutional Control Add restrictive covenant for: – Protecting engineering controls – land-use restrictions	\$25,000 per parcel \$32,000 per parcel					
3	Building Engineering Controls	2500 sf	\$202,000	10,000 sf	\$362,000	40,000 sf	\$690,000
4	Building Engineering Controls <i>and</i> Soil Vapor Extraction	(see Alternative 3 and Alternative 5 separately)					
5	Soil Vapor Extraction	2500 sf	\$712,000	10,000 sf	\$1,117,000	40,000 sf	\$2,436,000

### 10.8 State Acceptance

This criterion considers whether the State agrees with the analyses and recommendations, as described in the RI/FS and Proposed Plan.

The State of California concurs with the Preferred Alternative, however, the State of California expressed concern about implementation in its Concurrence Letter dated September 30, 2011. DTSC's concurrence letter is in the Administrative Record (DTSC, 2011).

### 10.9 Community Acceptance

This criterion considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

The community includes neighboring residents, residential property owners, residential tenants, on-site business owners, employees, commercial property owners, and all the various stakeholders (elected city, county, state and federal representatives, neighborhood groups, environmental groups, local and state agencies, etc).

While no community members opposed the proposed remedy in its entirety, three commenters expressed concern about various aspects of the remedy. One commenter, representing a commercial property owner, disagreed with the IC assigned to his property that would prohibit residential use. Another commenter, representing the property management company and owner of a commercial property, expressed concern about siting the SVE system's aboveground treatment equipment within their property. They expressed the desire to have the equipment located on the adjacent property, which is empty except for power transmission lines. A third commenter had several concerns, including possible use of a thermal oxidizer as a component of the SVE system, off-site disposal of excavated soil that transports waste to other communities, and about potential for vapor intrusion in the residential area south of the former plant property. As discussed in the Responsiveness Summary, Comment #4, EPA would utilize a similar stakeholder forum as used during the Waste Pits design process to involve and obtain input from stakeholders. These concerns and the other comments provided to EPA during the public comment period are addressed in Part III of this ROD, Responsiveness Summary.

## 11.0 Principal Threats

The NCP establishes an expectation that EPA will use treatment to address “principal threats” wherever practical. Principal threats are characterized as waste that cannot be reliably contained in place, such as liquids, highly mobile materials (e.g., solvents), and high concentrations of toxic compounds (e.g., several orders of magnitude above levels that allow for unrestricted use and unlimited exposure).

The NAPL and deep soil contamination represent high concentrations of toxic compounds that act as a continued source of groundwater contamination as contaminants slowly dissolve into the groundwater, and thus present a principal threat to the groundwater. This section describes the NAPL areas that constitute the principal threat and how the selected remedy will address them.

NAPL was observed at four of the groundwater contamination source areas: SA-3, SA-6, SA-11, and SA-12 (Figure 11-1). These four NAPL areas constitute the principal threat areas addressed in this ROD and are described in detail below. The primary contaminants present in the LNAPL areas are benzene and ethylbenzene. The LNAPL in the laboratory and pipeline area near the eastern boundary of the former plant site (SA-12) is inferred to be a complex of BTEX, styrene, and numerous other VOCs, SVOCs, and unidentified hydrocarbons.

### 11.1 NAPL Accumulation Areas

Two areas, Source Area 3 (SA-3) and Source Area 12 (SA-12) are considered to be “NAPL accumulation areas” because NAPL fluid was directly observed in groundwater samples from the water table in those areas. NAPL is present above, on and/or below the water table, however, the NAPL is present at residual (non-mobile) saturations. The NAPL was judged to exist at residual saturations based on hydrocarbon saturation testing from the MW-20 Pilot Program (URS, 2003).

#### Source Area 3

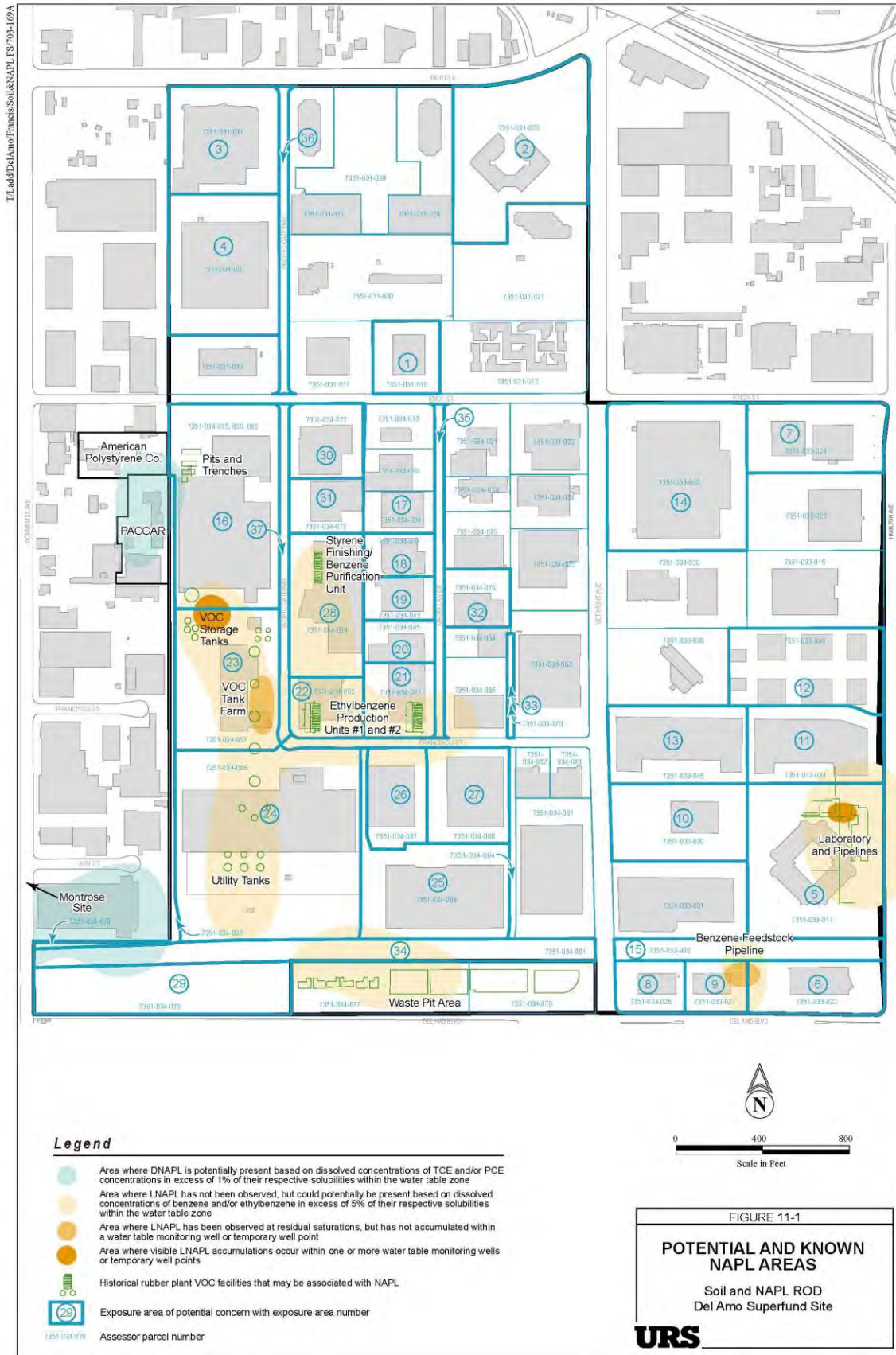
SA-3 is associated with the benzene storage tanks in the former styrene plant. This area is also known as the MW-20 area, named after the monitoring well where NAPL accumulation was first observed. See Figure 11-1. SA-3 is located in Area 23, and a portion of the source area extends into Area 16. Both Area 23 and Area 16 contain shallow soil contamination that warrants remedial action, separate from the deep vadose and saturated zone NAPL contamination that act as sources of contamination to the groundwater. SA-3 is impacted by LNAPL that is composed largely of benzene (>95%). The LNAPL is residual and discontinuous and is submerged below the water table primarily in a layer extending down 5 to 10 feet from the water table, with lesser amounts extending down 30 feet (reaching to about 90 feet bgs). The lateral extent of SA-3 lies entirely outside the footprint of the building on the property and is estimated to encompass an area of 19,200 sf.

The soil in the vicinity of SA-3 consists of a top 50-foot layer of low permeability silt to sandy silt with interbedded silty sand and sand layers up to 5 feet thick. Underlying that layer and below the water table, there is a greater proportion of more permeable sand and silty sand. The water table was found at a depth of approximately 50 feet bgs based on data from January 2004 (URS, 2010).

The MW-20 Pilot Program at SA-3 successfully extracted approximately 1.2 million gallons of groundwater over a 7-month period in 1996 and 1997. It was judged, however, that hydraulic extraction would not be a particularly effective remediation method because the extraction only removed approximately 36 gallons of separate-phase benzene NAPL, while an additional 1,420 gallons of benzene NAPL were recovered in the dissolved phase.

PART II DECISION SUMMARY

SECTION 11.0: PRINCIPAL THREAT WASTES



**Source Area 12**

SA-12 is a NAPL accumulation source area in the vicinity of the former butadiene plancor laboratory, located in Area 5, Area 11, and on Hamilton Avenue (Figure 11-1). Area 5 does not contain shallow soil contamination that warrants remedial action, only the NAPL and soil contamination in the deeper vadose and saturated zones that act as sources of contamination to the groundwater. Area 11 does contain shallow soil contamination that warrants remedial action due to its potential impact to surface receptors. Limited LNAPL accumulation was observed at SA-12 as a thin (less than 1/4 inch) layer of NAPL at two temporary well points. NAPL was also detected in soil samples. The LNAPL components include BTEX, styrene, cyclohexane, naphthalene, 1,2,4-TMB, butylbenzene, ketones, phthalates, phenanthrene, pyrene, and numerous unidentified compounds in the C10-C23 hydrocarbon range. The NAPL source area is adjacent to an office building and some fraction of the NAPL source area may extend under the building. The majority of the residual NAPL exists in a layer extending down 5 to 10 feet from the water table, with lesser amounts extending down to 80 feet bgs (Dames & Moore, 1998) and as shallow as 6 feet bgs. The NAPL has not been fully delineated, but it is estimated that the NAPL extends laterally over 215,000 sf, located on the northern half of Area 5 and extending onto Area 11 to the north and into the Hamilton Avenue to the east.

The soil in the vicinity of SA-12 consists of a top 60-foot layer of silt, with occasional layers of sandy silt or silty sand that are up to 5 feet thick. Underlying that layer, there is a greater proportion of silty sand and sandy silt layers. The water table was found at a depth of approximately 40 feet bgs based on data from January 2004 (URS, 2010).

**11.2 Residual NAPL Areas**

Two areas, Source Area 6 (SA-6) and Source Area 11 (SA-11), are considered to be “residual NAPL areas” where NAPL is present but at residual (non-mobile) saturations. These areas differ from the NAPL accumulation areas in that no NAPL accumulation was observed in these areas.

**Source Area 6**

SA-6 is associated with the VOC tank farm in the former styrene plancor and is located in Area 23, the same area that contains SA-3 (Figure 11-1). The NAPL is predominantly composed of benzene and ethylbenzene. The NAPL source area is adjacent to a warehouse building on the east side, and some fraction of the NAPL source area may extend under the building. The majority of the NAPL mass is located in the deep vadose zone, but there was intermittent contamination in the saturated zone down to approximately 80 feet bgs and up to approximately 10 feet bgs. It is estimated that the NAPL extends laterally 33,000 sf in area, affecting a soil volume of approximately 75,000 cy.

The soil in the vicinity of SA-6 consists of a top layer of low-permeability silt to sandy silt, with a few interbedded layers of silty sand to sandy silt up to 5 feet thick. Underlying that layer, the soil is predominantly fine or silty sand. The water table was found at a depth of approximately 50 feet bgs based on data from January 2004 (URS, 2010).

**Source Area 11**

SA-11 is associated with leakage from a former underground benzene pipeline in the former butadiene plancor and is located in Area 9, Area 6, and Area 15 (Figure 11-1). Area 6 also contains shallow soil contamination that warrants remedial action due to potential impacts to surface receptors. Area 9 and Area 15 do not contain shallow soil contamination warranting remedial action, only the NAPL and deeper vadose and saturated zone contamination that acts as a source of contamination to the groundwater. This NAPL is composed primarily of benzene. The NAPL source area is located behind an office building on the north side of Area 9, beneath a high voltage power transmission line on Area 15,



and beneath a portion of the parking lot in the northwest corner of Area 6. A small fraction of the source area may extend beneath the building on Area 9. The majority of the NAPL mass is located in the top 5 to 10 feet of the water table zone, with some of the contamination mass in the vadose zone near ground surface and intermittently deeper in the saturated zone down to 85 feet bgs. It is estimated that the NAPL extends laterally 38,000 sf in area, affecting a soil volume of approximately 91,500 cy.

Soil in the vicinity of SA-11 consists of an upper 34-foot layer of silt with interbedded silt and fine sand. Underlying that layer is an 18-foot layer of fine to medium sand from 34 to 52 feet bgs, and then a 38-foot layer of silt and clay with interbedded fine sands from 52 to 90 feet bgs. The water table was found at a depth of approximately 40 feet bgs based on data from January 2004.

### **11.3 Remedial Alternatives Selected to Address NAPL Areas**

The remedial actions selected for principal threat NAPL areas are a combination of ICs, SVE, and ISCO. The selected remedy for these areas includes active treatment components to decrease the amount of principal threat waste. These elements are part of Remedial Alternative 4, as discussed in Section 9.0 and summarized below.

ICs will be instituted for all four principal threat areas. ICs include building permit review, General Plan footnote and restrictive covenants to prevent residential use of the land, and to help ensure that the EPA reviews construction plans and that additional sampling needed is conducted. Informational outreach would be conducted to provide information about environmental conditions to owners, occupants, and the public. Restrictive covenants would have a provision to prohibit drilling into and use of groundwater.

The SVE treatment will be used to actively remove VOCs from the deep soil above the groundwater in each of the four principal threat areas (SA-3, SA-6, SA-11, and SA-12). SVE is the only treatment component selected for SA-6, where the principal threat waste exists almost exclusively in the vadose zone. SVE will extend beneath a portion of the building in SA-6.

ISCO will be used to treat NAPL in the water table zone in source areas SA-3, SA-11, and SA-12. ISCO consists of injecting chemicals oxidants into the groundwater in the NAPL/soil contamination area. The oxidants convert the NAPL into benign substances, carbon dioxide and water. This chemical reaction could also release heat, which would vaporize VOC contamination above the groundwater. Therefore, SVE will be implemented along with ISCO to capture these vaporized contaminants.

Prior to treatment, additional sampling will be performed to further define the extent of contamination requiring remediation.

## 12.0 Selected Remedy

The selected remedy for addressing soil and NAPL contamination at the Del Amo Site is Alternative 4, which includes the following components:

1. ICs (informational outreach, building permit review, General Plan footnote, restrictive covenants);
2. Capping for impacted shallow outdoor soil in Areas 2, 16, 28, and 35;
3. BECs for VOC-impacted shallow soil under the building in Area 16;
4. SVE for VOC-impacted, shallow outdoor soil in Areas 6, 11 and 23;
5. SVE for VOC-impacted shallow soil under the building in Area 23;
6. SVE for shallow soil in NAPL-impacted Source Area 6; and
7. ISCO and SVE for deep soil and groundwater in NAPL-impacted groundwater contamination Source Areas 3, 11 and 12.
8. For future areas of contamination encountered during redevelopment or construction:
  - o Excavation, or
  - o BECs, capping, or SVE and
  - o Restrictive covenants

The site areas applicable to each of the above components are indicated in Table 12-1 and on Figure 12-1. Each component is described in more detail below. For any remedy that is selected, EPA will evaluate opportunities to lessen the overall environmental impact of the actions. The principles of EPA's Green Remediation policy will be followed.

### 12.1 Rationale for the Selected Remedy

The areas where each remedy component will be applied are listed in Table 12-1 and shown in Figure 12-1. In addition, if new contamination areas are discovered in the future during construction projects, where contamination exceeds risk-based levels, the remedy for such areas would be: (1) Excavation, (2) BECs (if contamination is beneath a building and excavation is infeasible), or (3) SVE for VOCs and capping for non-VOCs (if interference makes excavation impractical).

The No Action Alternative (Alternative 1) does not meet the first threshold criteria of protecting human health and the environment because it does nothing to prevent exposure, so it was eliminated from further consideration. The Institutional Controls Only Alternative (Alternative 2) is not protective for the two locations with soil vapor intrusion potential, and does not reduce the amount of contamination present or physically prevent human exposure, making its effectiveness less certain in the long-term than all other alternatives. For these reasons, it was eliminated from further consideration, even though it is fairly easy to implement and low cost.

Alternatives 3, 4, and 5 can each be subdivided into three components – shallow outdoor soil, shallow soil beneath buildings, and deep soil/groundwater contamination source areas and are discussed separately below.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-1: Preferred Alternative Summary**

Area Number	Active Components					Institutional Controls				
	Cap	SVE (shallow)	BEC	ISCO	SVE (deep)	1	2	3	4	5
1						X	X			
2	X					X	X	X	X	
3						X	X			
4						X	X	X	X	X
5				X (SA12)	X (SA12)	X	X	X	X	X
6		X		X (SA11)	X (SA11)	X	X	X	X	X
7						X	X	X	X	
8						X	X	X	X	X
9				X (SA11)	X (SA11)	X	X	X	X	X
10						X	X	X	X	
11		X				X	X	X	X	X
12						X	X	X	X	
13						X	X	X	X	
14						X	X	X	X	
15				X (SA11)	X (SA11)	X	X	X	X	X
16	X		X	X (SA3)	X (SA3)	X	X	X	X	X
17						X	X	X	X	X
18						X	X			
19						X	X	X	X	X
20						X	X	X	X	X
21						X	X			
22						X	X	X	X	X
23		X		X (SA3)	X (SA3, SA6)	X	X	X	X	X
24						X	X	X	X	X
25						X	X			
26						X	X			
27						X	X			
28	X					X	X	X	X	X
30						X	X	X	X	
31						X	X			
32						X	X	X	X	X
33						X	X	X	X	X
35	X					X	X	X	X	X
36						X	X	X	X	
37						X	X			
Unnumbered Areas						X	X			

**TABLE 12-1: Preferred Alternative Summary**

Area Number	Active Components					Institutional Controls				
	Cap	SVE (shallow)	BEC	ISCO	SVE (deep)	1	2	3	4	5

Notes:

Remedy Components

Cap = Capping

BEC = Building Engineering Controls

ISCO = In-Situ Chemical Oxidation

SVE = Soil Vapor Extraction

Institutional Controls

1 Information

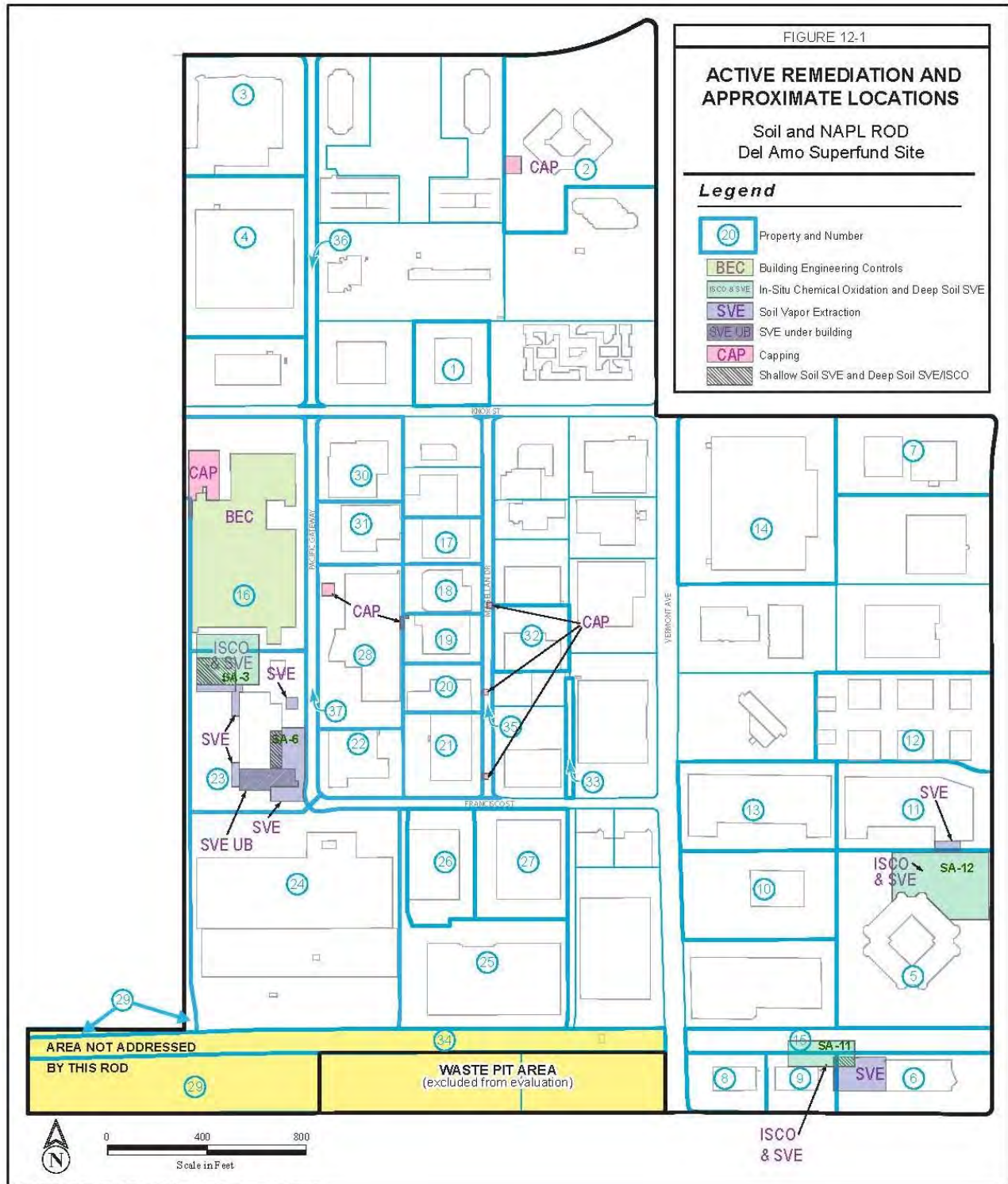
2 Permit Review

3 General Plan footnote

4 Restrictive Covenants (prohibiting disruption of cleanup activities, requiring EPA review and approval of construction plans, prohibiting residential use)

5 Restrictive Covenants (requiring EPA approval prior to drilling into groundwater)

Whereas there are 26 areas requiring restrictive covenants, the exact number of individual parcels that will be covered, and the exact number of covenants needed to cover all of the areas will be determined during remedial design.



**Outdoor Shallow Soil Component – Rationale for Alternative 4**

For the outdoor shallow component of Alternatives 3, 4, and 5, each alternative includes the same ICs. In addition, Alternative 3 consists of capping all the contaminated areas, Alternative 4 consists of capping the areas where non-VOCs drive the risk (VOCs present in some of the areas) and using SVE where only VOCs are present, and Alternative 5 consists of excavation for all areas.

Capping is easier and less costly to implement than SVE and excavation. Although excavation removes the most contamination, making it the most effective in the long-term, it costs more and has more negative short-term impacts than the other alternatives. Alternative 4 is a combination of capping (for the non-VOC driven areas) and SVE (VOC areas), which is less costly and less disruptive than excavation alone but more permanent and effective in the long-term than capping alone. For these reasons, Alternative 4 (Capping and SVE – along with ICs) is the selected remedy for the outdoor shallow soil component.

For any site-related outdoor shallow soil contamination encountered in the future above the action levels, the alternatives are the same – capping, SVE, or excavation. However, because these areas would be part of construction activities being performed by property owners or tenants, excavation is more cost-effective and less disruptive when conducted in conjunction with the construction. Because excavation is a more permanent alternative than capping and most effective in the long-term, reducing the cost and disruption issues makes excavation the best approach. Therefore excavation is the selected remedy for shallow soil contamination discovered in the future, unless EPA determines that interference with structures, utilities, or other infrastructure makes excavation impractical. In such cases, SVE would be implemented for VOC contamination, and capping would be implemented for non-VOC contamination.

**Shallow Soil Beneath Buildings Component – Rationale for Alternative 4**

For shallow soil beneath buildings, Alternative 3 consists of BECs, Alternative 5 consists of SVE, and Alternative 4 consists of both (BECs at one location and SVE at a different location). Building engineering controls cost less and are easier to implement than SVE. However, SVE is more effective in the long-term because it removes the contamination from the soil. There are two buildings requiring action, but SVE is more implementable in one than the other, due to size and configuration. Thus, the selected remedy utilizes SVE in one location and BECs in the other.

For any site-related shallow soil contamination encountered beneath buildings during future construction activities above the action levels, the alternatives are BECs, SVE, or excavation. Excavation is most effective in the long-term because it removes the contaminated soil, and it would not cause additional disruption in most situations because the construction activity would be occurring anyway. However, if EPA determines that excavation would be excessively impractical, the selected remedy will be BECs. Building engineering controls are more implementable with fewer short term impacts than both excavation and SVE, but are still effective because they prevent contaminants from accumulating indoors.

**NAPL/Groundwater Contamination Source Areas Component – Rationale for Alternative 4**

For the NAPL/groundwater contamination source areas, Alternatives 3, 4, and 5 include Institutional Controls (ICs) and Soil Vapor Extraction (SVE). In addition, Alternative 3 consists of hydraulic extraction, Alternative 4 consists of In-Situ Chemical Oxidation (ISCO), and Alternative 5 consists of In-Situ Soil Heating (ISSH).

The key factors in selection of this remedy are the amount of contamination the alternatives could remove, cost, and disruption to the neighbors (which affects implementability and short term effectiveness). Soil heating removes the most contamination, followed by chemical oxidation and then hydraulic extraction. Soil heating is more expensive than chemical oxidation and hydraulic extraction, which cost approximately the same amount. Soil heating and hydraulic extraction are the most disruptive alternatives in the short-term, with chemical oxidation being significantly less disruptive. Therefore, the selected remedy for this component is ISCO (with ICs and SVE). Chemical oxidation achieves the best balance of the evaluation factors because it is second best in mass removal, lowest in cost, and the least disruptive.

SA-6 will only have SVE (and ICs) because its contamination is mostly in the vadose zone. Chemical oxidation is only applicable in the saturated zone at this site. The alternatives for this source area were ICs alone or SVE (and ICs). SVE was selected because it will remove a significant amount of contamination, which makes the alternative more effective in the long-term than ICs alone.

## 12.2 Detailed Description of Selected Remedy

### 1. Institutional controls

There will be four layers of ICs included in this remedy. These layers reinforce each other. If one layer were to fail, the other layers will still be in place to prevent any potential exposure. The general goals of the ICs are to minimize the potential for future exposure to residual contamination at the site and protect the remedy. Specifically, the ICs will work together to achieve the following for all parcels:

- Make property owners, tenants, and construction personnel aware of the site-related contamination,
- Ensure that EPA is aware of and reviews construction plans before any excavation occurs that could encounter Site-related contamination.

For parcels determined by EPA to exceed action levels for residential use, the ICs will:

- Prohibit residential use;
- Prohibit interference with any other remedial activities within the property;
- Prohibit drilling into and use of groundwater, if the property overlies groundwater contamination.

The ICs to achieve these goals include informational outreach, building permit review, General Plan footnote, and restrictive covenants (Section 9). The following paragraphs discuss these ICs, where they will be applied, how they will be implemented and how the IC goals will be met.

#### IC Layer 1: Informational Outreach

Informational outreach (IC layer 1) will be applied to all on-site properties. The outreach will include mailings, websites, publically accessible databases and any other venue as determined by EPA. Environmental information about the properties will be made available, including data from the remedial investigation and information from the Baseline Risk Assessment and ROD and any other information as determined by EPA. The targeted audience includes owners, tenants, prospective owners and tenants, developers and other professionals supporting the above. The outreach can be used to support the other IC layers as well. The goal is to inform the public about the environmental condition of the Site and the controls and restrictions that are in place. The outreach will be accomplished by EPA, DTSC and the potentially responsible parties.

**IC Layer 2: Building Permit Review**

The building permit review IC (IC layer 2) will also be applied to all on-site properties (Table 12-1, Figure 12-1), with the objective of reviewing planned construction activities that could cause exposure to contaminants. This will help ensure that EPA has the opportunity to review construction plans for projects that involve soil disturbance, as described below. This IC layer is a tool for information exchange and a conduit to additional investigation and clean-up activities if deemed warranted by EPA. By itself, the building permit review IC does not restrict use or conduct clean-up actions. Rather, it identifies areas that need further clean-up. The clean-up, if warranted, shall be conducted pursuant to the "Future Areas encountered during redevelopment or construction" component of the remedy.

The building permit review program is already operating successfully as a pilot program in cooperation with the City of Los Angeles Department of Building and Safety. The program targets site properties where development activities would result in subsurface penetrations of more than 18 inches, or changes in the type of land use. These properties are identified through notifications from developers/property owners and the land watch monitoring described below. Notification from the developers/property owners is encouraged through an agreement with the City of Los Angeles wherein Del Amo Site properties are flagged on the City's internet-based Zoning Information and Map Access System (ZIMAS). When an application for a building or grading permit is issued for a ZIMAS-flagged property, the applicant is informed by city staff that the property is located on the Del Amo Superfund Site, and documentation with instructions on contacting the Del Amo Environmental Review Team (ERT) is provided.

The building permit review IC program will continue as described above and will be instituted in all areas of the site. As building permit applications are reviewed by the City of Los Angeles Building and Safety Department, applicants will be referred to the ERT to review construction plans and determine whether contaminated soil or groundwater would be encountered. EPA would then require additional sampling and remedial activities if needed.

The Del Amo Environmental Review Team (ERT), is currently composed of EPA, DTSC and the AOC Respondents. Similar to the pilot program, EPA expects that potentially responsible parties (PRPs) shall serve as the point of contact for permit applicants. Upon contact, the PRPs shall conduct an initial review by obtaining information from the applicant regarding the nature of the proposed project, proposed land use, and locations and depths of excavations. If the proposed project involves soil penetration deeper than 18 inches bgs<sup>7</sup> or a change in land use is proposed, the PRPs shall prepare a Screening Evaluation Summary Report (SESR), which shall include the following information:

- A summary of the proposed project
- A summary of the risk information for the parcel (from the BRA and FS)
- A map of past sampling locations on the parcel, historical rubber plant facilities, and proposed excavations and construction activities
- A data summary table including the laboratory analytical results for each sampling location on the parcel, highlighting any concentrations exceeding regulatory screening criteria

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<sup>7</sup> The 18 inch depth was selected as the depth of concern that would initiate a SESR because the Site had been graded and base material imported during redevelopment. Thus, the native soil that has the potential for containing site-related contamination would not be encountered shallower than 18 inches bgs.



- A summary of recommendations for further action, as appropriate. Recommendations could include additional sampling and risk assessment

Following EPA's review of the SESR, EPA will determine whether or not the project can proceed without further evaluation. If EPA determines that further evaluation and/or remedial action is necessary, EPA will require that any necessary evaluation, which may include sampling and risk assessment activities, be performed. Based upon existing data and any further evaluation, the remedies described in Section 12.2.8 (Future Areas of contamination encountered during construction or redevelopment) of this ROD will be implemented.

### **IC Layer 3: General Plan Footnote**

EPA and the PRPs will work with the City to apply a General Plan footnote (IC layer 3) to the Site for areas exceeding the action level for residential use. The action level for residential use is based on the BRA results, and is any area (known as "EAPC" in the BRA) with an excess cancer risk greater than one in one million or a non-cancer hazard index greater than 1.0. The 26 properties (Areas) where the General Plan footnote IC will be applied include Areas 2, 4-17, 19, 20, 22-24, 28, 30, 32, 33, 35, and 36 (Table 7-9, 12-1, and Figure 12-1).

The footnote will state that the land is within the Del Amo Superfund Site and is not appropriate for residential use. The current zoning for these properties does not allow residential use. The current zoning at the Site is predominantly manufacturing/industrial with one parcel having a dual commercial-industrial designation, and two parcels having a public facility designation. The purpose of this IC layer is to strengthen the existing restrictions on residential use and prevent unacceptable exposure to contaminants that could occur during residential use. A footnote about the Superfund Site will remind future planners about the contamination. Adding a footnote to the General Plan constitutes an amendment to the General Plan and requires approval of the Planning Commission and the City Council. The General Plan footnote IC supports and enhances the IC program but is not itself a key element.

### **IC Layer 4: Restrictive Covenants**

The restrictive covenants required for site properties (Areas) are legal agreements entered into by the property owner and DTSC pursuant to California law (California Civil Code section 1471 and 22 C.C.R. 67391.1). The covenants shall run with the land and be binding upon all future owners and occupants. Each covenant shall be recorded with the county recorder's office and will contain specified restrictions on use. The restrictive covenants will also be enforceable by EPA as a third party beneficiary.

The restrictive covenants will be applied to properties (Areas) exceeding action levels for residential use. The action level for residential use is based on the baseline risk assessment (BRA) results, and is any area (known as "EAPC" in the BRA) with an excess cancer risk greater than one in one million or a non-cancer hazard index greater than 1.0. These areas, the same 26 areas as for the General Plan footnote IC, include Areas 2, 4-17, 19, 20, 22-24, 28, 30, 32, 33, 35, and 36 (see Table 7-9, 12-1, and Figure 12-1).

The restrictions contained in the covenants will vary depending on the property. Figure 12-1 presents a map of all Site areas. The restrictions and requirements for each restrictive covenant are shown in Table 12-1 and are described as follows:

- Residential use will be prohibited;
- Any construction or redevelopment plans involving excavation must obtain EPA review and approval prior to initiation of such work;

- Interference with remedial activities, systems, or components will be prohibited, including both investigation and cleanup activities;
- Drilling into and use of groundwater will be prohibited without prior approval by EPA.

The covenants recorded on properties numbered 2, 5, 6, 9, 11, 15, 16, 23, 28, and 35 (Table 12-1) will prohibit interference with any remedial activities, systems, or components (for capping, SVE, or chemical oxidation remedies).

Restrictive covenants implemented in selected areas that overlie groundwater contamination will prohibit drilling into and use of groundwater without prior approval by EPA and DTSC. This restriction will be implemented in the covenants for Areas 4, 5, 6, 8, 9, 11, 15, 16, 17, 19, 20, 22, 23, 24, 28, 32, 33, and 35 (Table 12-1).

Monitoring of the IC program shall be conducted in part through land-activity monitoring. "Land activity monitoring" is a service that monitors construction permit activity (construction, grading, well installation), land use permit activity, underground services alerts, and property transfers to identify activities that could potentially result in contact with soil or other unacceptable exposures.

## 2. Capping for VOC- and non-VOC-impacted shallow outdoor soil

Capping involves covering the area of impacted soil with a suitable material such as concrete, asphalt, clean soil, or other surface that eliminates the potential for direct contact exposures. Capping is the selected remedy on properties numbered 2, 16, 28, and 35. Capping will be implemented on areas of these properties where non-VOCs, and in some cases VOCs, are present above the action level. The EPA action level is the concentration in soil that would cumulatively pose a cancer risk exceeding 1E-6 or a non-cancer hazard index exceeding 1.0 if exposure were to occur to property occupants in a commercial-use setting (EPA, 2012). For arsenic, PAHs and DDT, the action level also must exceed their background levels (PAHs expressed as benzo(a)pyrene equivalents). These properties are listed in Table 12-1 and shown on Figure 12-1. The footprint of the cap within each of these properties will be determined during remedial design, as discussed in more detail in Section 12.4 "Expected Outcomes of the Selected Remedy." The contaminants of concern that have been identified in the areas to be capped are shown in Table 12-2.

revised TABLE 12-2: Contaminants of Concern for Capping

Chemical	Background (mg/kg)
Benzo(a)pyrene equivalent	0.9
Benzo(a)pyrene	NA
Dibenzo(a,h)anthracene	NA
Benzo(a)anthracene	NA
Benzo(b)fluoranthene	NA
Benzo(k)fluoranthene	NA
Indeno(1,2,3-c,d)pyrene	NA
4,4'-DDT	10
n-Nitrosodiphenylamine	NA
Arsenic	25.0

EPA shall define the procedure for determining cumulative risk during the remedial design process, and that procedure shall be consistent with the Baseline Risk Assessment (Geosyntec and URS, 2006).

A total capped area of 38,500 sf was assumed for cost estimating purposes. These areas are already covered with asphalt, concrete, or landscaping. This remedy component is expected to involve an initial inspection and evaluation followed by repairs, enhancements or replacements of existing surfaces (e.g. slurry sealing) when needed. Periodic inspections, repairs, and replacement will occur thereafter. The capped surfaces will be monitored in perpetuity to ensure long-term effectiveness. The restrictive covenants will contain a provision to ensure the capped areas are not disturbed as long as the contaminated soils remain.

### 3. Building engineering controls for VOC-impacted shallow soil under a building

BECs will be applied at the building on property number 16 in the western portion of the site (see Table 12-1 and Figure 12-1) if VOC vapors from subsurface contamination accumulate within the building in excess of the action levels. Action levels shall be the higher of the outdoor background levels or the EPA Regional Screening Levels (RSLs) and the California Human Health Screening Levels (CHHSLs) for indoor air in a commercial use scenario.<sup>2</sup> See Table 12-3.

Both indoor air and outdoor background concentrations of the contaminants of concern will be sampled and evaluated to determine whether action levels are clearly exceeded (statistically, as determined by EPA during remedial design). Aboveground sources of the target VOCs on the property will be eliminated or minimized to the extent possible prior to indoor air sampling. The purpose of this evaluation is to address the common complication caused by the presence of indoor air contaminants from unrelated sources. Such sources, unrelated to the Superfund site, could include aboveground sources associated with the existing business operations or air pollution emanating from other sources in the region. If the action levels are not clearly exceeded, periodic monitoring of the same parameters shall be instituted. If action levels are clearly exceeded, then building engineering controls will be implemented.

The RSL and CHHSL levels for the VOC constituents known to exist in the subslab are as follows:

**TABLE 12-3: RSL and CHHSL Levels for BECs**

Chemical	Indoor Air	
	CHHSL ( $\mu\text{g}/\text{m}^3$ )	RSL ( $\mu\text{g}/\text{m}^3$ )
Benzene	0.14	1.6
Tetrachloroethene	0.69	2.1
Trichloroethene	2.04	6.1

If other VOCs are found in the subslab during any RD sampling activities, their concentrations will be compared to their respective action levels as well.

If building engineering controls are to be implemented, the existing building ventilation system will be modified and floor sealing performed as appropriate. The specific measures will be selected by EPA during remedial design. Modification of the ventilation system may include resizing or redesign of existing ventilation openings on the exterior walls of the building, modification of mechanical air circulation systems, or building pressurization by modifying the HVAC system. Floor sealing involves application of a sealant to the floor surfaces to retard or prevent intrusion of VOCs through the floor slab and into the building.

<sup>2</sup> The lower of the RSL or CHHSL levels for each contaminant of concern would be used.

If ventilation modifications and floor sealing alone are insufficient to reduce concentrations to below action levels, sub-slab venting will be implemented. Subslab venting involves extraction of sub-slab vapors by passive venting using natural pressure gradients, or active venting using extraction fans (blowers). Passive venting systems use slotted piping installed in the subsurface. Active sub-slab venting uses suction pits or horizontal wells placed under the building floor, connected by piping to a vapor extraction fan or blower. The extracted vapors may need to be treated with activated carbon depending on the VOC concentrations in them.

Data collection during the remedy design process will also help EPA to determine the control or combination of controls that are most appropriate and the portion of the building that will need the BEC. For cost estimating purposes, it was assumed that approximately 10,800 sf at the northwest corner of the building is the extent of VOC-impacted sub-slab soils that require this control.

The restrictive covenant IC for property number 16 will prohibit interference with the BECs to ensure the health and safety of the building occupants. If specific ventilation measures are required as part of the remedial action, the restrictive covenant will also require continued operation of those measures (or equivalent, as approved by EPA). Ongoing monitoring of the indoor air will occur as long as the VOC constituents of concern exist in the sub-slab at levels exceeding EPA's action levels.

#### 4. SVE for VOC-impacted outdoor shallow soil

SVE will be implemented to remove VOCs from the shallow soil at properties numbered 6, 11, and 23, as listed in Table 12-1 and on Figure 12-1. SVE is an active remedial technology that removes VOCs from impacted soil by vacuum extraction through wells, followed by treatment of the VOC vapors by aboveground treatment equipment, such as adsorption, condensation, thermal oxidation, or internal combustion engine. Additional sampling will be performed during remedial design to determine the extent of shallow soil requiring SVE remediation at each property. SVE will be implemented on these properties where VOCs are present above the soil action levels, based on the RSLs, as shown in Table 12-4.1. This action level can be adjusted to incorporate other VOC constituents besides these, if found during additional remedial design sampling to exceed the risk levels and require action where the above had not required action. In such cases, the action level for all VOC contaminants combined would be a cumulative risk of one in one million excess cancer risk or hazard index greater than 1 for an industrial/commercial use exposure scenario (EPA, 2012). For cost estimating purposes, it was assumed SVE would be applied to a total area of 73,200 sf. Separate SVE systems are anticipated for each property.

**TABLE 12-4.1: RSL Levels for Outdoor SVE**

Chemical	Concentration (mg/kg)
Benzene	5.4
Chloroform	1.5
Tetrachloroethene	2.6
Trichloroethene	6.4

The SVE technology includes vapor extraction wells connected by piping to an aboveground vapor extraction and treatment system (VETS). The VETS is expected to include a high vacuum blower (e.g., positive displacement blower or a liquid ring pump capable of greater than 8 inches of mercury vacuum) connected to vapor treatment equipment. The appropriate vapor treatment technology

will be selected by EPA during remedial design from a range of options that includes thermal oxidizers, vapor phase carbon adsorbers, condensers, and internal combustion engines. For SVE in outdoor soil, vertical wells screened between approximately 5 and 15 feet bgs are expected to be used. The details of well construction, spacing and layout for each SVE system will be determined during remedial design.

The total flow rate and sizing of the equipment for each SVE system will depend on both the total number of wells needed and the physical properties of the soil. The wells are typically completed flush to the surface and placed in traffic-rated well boxes with an isolation valve and a sampling port on the well head. The wells will likely be connected by piping that is placed below grade in trenches leading to the compound that houses the aboveground treatment equipment. This approach will minimize the impact on the property owners and tenants at these properties. The duration of remediation at each property was estimated to be 3 years.

The clean-up levels and system shutdown criteria are described in Section 12.4 "Expected Outcome of the Selected Remedy." The restrictive covenant IC for properties numbered 6, 11 and 23 will prohibit interference with the SVE systems, including wells, piping and treatment equipment, during system operation until EPA determines that the system is no longer needed.

### 5. SVE for VOC-impacted soil under a building

SVE will be implemented for soil beneath one building on property number 23, located in the western portion of the site (see Table 12-1 and Figure 12-1). Prior to implementing SVE, additional subslab sampling will be performed during remedial design to determine the extent of shallow soil under the building requiring remediation. SVE will be implemented on this property where concentrations of the target constituents exceed the action levels. The action levels shall be determined as follows: The indoor air RSL (Table 12-4.2) or the contaminant concentration in background air, whichever is higher, shall be divided by site-specific attenuation factors (approved by EPA) to obtain sub-slab contaminant concentrations and soil gas contaminant concentration in soil outside but adjacent to building.

**TABLE 12-4.2: Indoor Air RSL**

Chemical	Concentration ( $\mu\text{g}/\text{m}^3$ )
Benzene	1.6
Chloroform	0.53
Tetrachloroethene	2.1
Trichloroethene	3.0

**SUMMARY OF CLEANUP APPROACH**

- 1. Air.** Take the higher of the indoor air RSL or the contaminant concentration in background air;
- 2. Attenuation.** Divide #1 by:
  - a. attenuation factor to obtain sub-slab contaminant concentrations, and
  - b. attenuation factor to obtain soil gas contaminant concentration in soil outside but adjacent to building [factors (a) and (b) likely are different]
- 3. Results.** Action and cleanup levels for:
  - a. sub-slab
  - b. soil outside but adjacent to building

Although for cost estimating purposes it was assumed that SVE will be applied under the entire building (approximately 63,000 sf), subsequent information showed that the remedy will only be needed in the southern portion of the building. The exact area requiring treatment will be determined during remedial design.

The SVE technology will include vapor extraction wells, piping, a high vacuum blower, and vapor treatment equipment as discussed earlier (Item 4). The appropriate well designs, spacing and layout for this SVE application will be determined by EPA during remedial design. The wells will typically be connected by subsurface piping to a high vacuum blower and a vapor treatment system located in a fenced compound on the surface. The vapor treatment technology options are the same as discussed earlier (Item 4) and will be selected by EPA based on site-specific considerations during remedial design.

The flow rate and equipment sizing for this SVE system will depend on the number of wells and soil physical properties. The duration of the SVE system operation was estimated to be 3 years. Shutdown of the SVE system will occur as described above for VOC-impacted outdoor soil (Item 4). The restrictive covenant IC for property number 23 will prohibit interference with the SVE system during system operation.

The cleanup levels and system shutdown criteria are described in Section 12.4

### 6. SVE for vadose zone soil in a NAPL-impacted groundwater contamination source area

SVE will be used to remove VOCs from the NAPL-impacted vadose zone soil in SA-6 located on property number 23, as listed in Table 12-1 and shown on Figure 12-1. SVE will also be used in SA-3, SA-11, and SA-12, but those locations will be discussed in item #7 as they will be implemented in conjunction with In-Situ Chemical Oxidation. Additional sampling will be performed during remedial design to determine the exact areal and vertical extent of NAPL-impacted soil at SA-6 requiring remediation. This SVE system will treat an estimated area of approximately 33,000 sf, adjacent to the east and southeast portions of the building. This SVE system will include the same technology components described earlier under Item

4. It is anticipated that vertical wells screened in the shallow and deep vadose zone soil will be used in this source area. Confirmatory sampling with chemical analysis will be performed during remedial design to determine the treatment zone depth. Appropriate well designs, spacing, and layout for this SVE application will be determined by EPA during remedial design.

The wells will typically be connected by subsurface piping to a high vacuum blower and vapor treatment system located in a fenced treatment compound at the surface. The vapor treatment technology will be selected by EPA based on site-specific considerations during remedial design, as discussed earlier (Item 4). The flow rate and equipment sizing for this SVE system will depend on the number of wells and physical properties of the soil. The duration of system operation is estimated to be 4 years. The cleanup levels and system shutdown criteria are described in Section 12.4. The restrictive covenant IC for property number 23 will prohibit interference with this SVE system during operation.

### **7. ISCO and SVE for deep soil and groundwater in NAPL-impacted groundwater contamination source areas**

In-Situ Chemical Oxidation (ISCO) and SVE will be applied in combination at NAPL source areas SA-3, SA-11 and SA-12 as listed in Table 12-1 and shown on Figure 12-1. ISCO is a technology that oxidizes (chemically breaks down) VOC contamination, converting the VOCs into nontoxic byproducts, such as carbon dioxide and water. At Del Amo it will be applied in the saturated zone. SVE will be applied to remove VOC contaminants in the vadose zone soil and any VOC vapors that volatilize from groundwater during implementation of the ISCO injections. Injection of chemical oxidants into groundwater will also increase dissolved oxygen levels in the vicinity of the injection wells and promote aerobic biodegradation of the dissolved VOCs. Prior to implementing ISCO and SVE, additional sampling will be performed to refine the extent of VOC NAPL contamination requiring remediation. For cost estimating purposes, it was assumed that the NAPL source areas requiring ISCO and SVE remediation were 50,000 sf for SA-3; 22,500 sf for SA-12; and 38,000 sf for SA-11. The cleanup goals for ISCO and SVE are described in Section 12.4.

There are several chemical oxidants that EPA will consider for injection, including Fenton's reagent (hydrogen peroxide and iron), ozone, persulfate, and permanganate. Injection of the selected oxidant will be accomplished using either permanent injection points or direct-push temporary injection points. EPA will determine these details, and the appropriate frequency of oxidant injection (semiannual, quarterly, or continuous) during remedial design, based on the results of laboratory and field-based pilot studies. The expected duration of remediation will also be updated during remedial design, based on these studies.

Using semi-annual oxidant injection events, the timeframe for achieving cleanup goals at each of these source areas was estimated to be 4 to 8 years.

The SVE system to be used in concert with ISCO will include the same components described for Item 4 above. The SVE wells are anticipated to be vertical wells screened in deep soil between 15 feet bgs and the water table, placed in a staggered array at a spacing of 45 to 60 feet. The depth to the water table at these three NAPL-impacted source areas varies between 35 and 50 feet bgs. The actual well construction details, well spacing, and the number of wells will depend on soil conditions at each source area, to be determined by EPA during remedial design. The SVE wells will be connected by a high vacuum blower to a vapor treatment system on the surface at each source area. The vapor treatment technology will be selected by EPA based on site-specific considerations during remedial design as discussed earlier. The flow rate and equipment sizing for each of these SVE systems will depend on the number and type of wells needed to address the vertical and horizontal extent of the zone to be treated.

Restrictive covenant ICs requiring that the ISCO and SVE systems are not to be disturbed during operation will be applied at properties containing SA-3, SA-11 and SA-12, which include property numbers 23, 16, 5, 6, 9, and 15.

### **8. Future Areas of contamination encountered during redevelopment or construction**

The remedy for areas of contaminated shallow soil (less than 15 feet bgs) that exceed EPA's action levels for contaminants of concern, and that are discovered in the future, will be excavation and off-site disposal, with the following exceptions:

- If VOC contamination exceeding action levels underlies a building such that excavation is impractical, then BECs will be required.
- If excavation is impractical because of interference with other structures or infrastructure (and thus less implementable), then SVE (for VOCs) and capping (for non-VOCs) will be undertaken. Such interference includes utilities, space constraints, and potential impact to structural and foundation integrity.

EPA's action levels will be the RSL or CHHSL screening levels, whichever is more conservative for the commercial use scenario. In addition, contaminant concentrations would need to exceed background levels, in addition to exceeding screening levels, for any constituents with background levels established by EPA. Thus, the action level would be the screening level or the background level, whichever is higher. Action levels based on indoor or ambient air would be calculated in the same manner as described in Part 5. The cleanup goals are discussed in Section 12.4. If contaminants of concern are left in place above a level that would not allow for unrestricted use, then the restrictive covenant ICs will be implemented if not already in place. For any future areas addressed, EPA expects that they will be substantially analogous to the areas that were evaluated pursuant to the 9-Criteria Analysis in Section 10 of this ROD, such that the 9-Criteria Analysis already performed shall be used by EPA to determine appropriate future actions. EPA will document each future action with memoranda to the site file.

### **12.3 Summary of the Estimated Remedy Costs**

The overall present worth cost of the remedy is \$52,504,000 utilizing a discount rate of 5 percent. Table 12-5 shows how this cost is further divided by the various remedy components and by capital, O&M, and contingency. Tables 12-6 through 12-13 present more detailed descriptions of the cost of each remedy component. Table 12-14 presents the estimated costs for future areas of site-related contamination encountered during redevelopment or construction. Table 12-5 shows the difference in the overall present worth cost if higher or lower discount rates are utilized. The difference between the cost presented in the Proposed Plan (\$50,430,000) and the cost presented herein is discussed below.

The costs presented here were developed in the Soil and NAPL FS (URS, 2010). The following assumptions were made to generate the cost estimate:

- The total cost does not include remediation of site-related contamination encountered in the future; however, the unit cost for remediation of such contamination is presented.
- This cost estimate assumes 20 percent contingency for all remedy components, except for NAPL-related ISCO+SVE, which uses 40 percent.

The values in these cost estimate tables are based on the best available information regarding the expected scope of the remedy. The actual extent of the remedial actions and subsequently costs may vary. This estimate is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual costs of the remedy.

**Difference Between Proposed Plan and ROD Costs**

As shown in Table 12-5, the overall present worth of the remedy is \$52,504,000. This varies from the \$50,430,000 cost presented in the Proposed Plan for the following reasons:

The ICs costs for the land parcels in the Group 1 and 2 categories had not been included in the Proposed Plan. The addition of the costs for these two IC Layers is approximately \$2,400,000. These 40 parcels will only have the basic building permit review IC and associated informational outreach and monitoring. This IC for these parcels did not differ between the alternatives in the Proposed Plan, so the Proposed Plan did not reflect their approximately \$2.4 million cost.

For the in-situ chemical oxidation component of the remedy, the Proposed Plan cost estimate assumed use of permanent injection wells for Source Area 3. In this ROD, the cost estimate assumed use of temporary injection points for Source Area 3, to be consistent with assumptions for Source Areas 11 and 12. This change decreases the cost estimate by approximately \$800,000.

EPA's cost estimate in the Proposed Plan for the capping remedy on Area 35 assumed that the area to be capped would be 2,500 sf. Based upon subsequent review, however, EPA increased that estimate of the area to be capped to 7,500 sf. This change in size increases the cost estimate by approximately \$200,000.

The fourth variance pertains to indirect capital and contingency rates. For the ROD cost presentation, the IC costs were given an indirect capital rate and contingency rate that was less than the rates used for the construction-related costs of the rest of the remedy. In the Proposed Plan, they had the same rates. The change was made because it was believed that IC implementation has lower indirect capital costs and a lower chance of implementation cost variability than physical construction. This resulted in an overall savings of approximately \$200,000.

The fifth cost variance also relates to contingency rates. Due to an oversight, groundwater monitoring costs in the Proposed Plan did not have the contingency rate applied to them, but in the ROD they did have contingency rates applied. This resulted in a \$400,000 cost increase in the ROD.

**Costs for Remediation of areas of site-related contamination encountered during Redevelopment or Construction**

As described in Section 12.2, Detailed Description of Selected Remedy, Part 8, the future contingencies component addresses site-related contamination encountered in the future during construction projects that have shallow soil exceeding EPA's action levels.

Because the volume, location, and constituents of such contaminated soil is unknown at this time, EPA estimated a range of possible costs depending upon these variables. EPA estimated the costs for relatively small, medium or large areas of contamination for each type of remedial action (excavation, BECs, capping or SVE) as shown in Table 12-14. The table defines the sizes of the contaminated areas that would be considered small, medium, or large. Note that excavation costs also varied depending on the depth of the excavation. Cost estimates are provided for shallow (less than 5 feet), moderate (5 to 15 feet) and deep (more than 15 feet) excavations. Estimates also were made for whether the excavated soil qualified as hazardous or non-hazardous for disposal purposes.



## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-5: Remedy Cost Estimate Summary**

Cost Type and Breakdown		Shallow Soil					NAPL Source Areas		Total Cost
		ICs + Monitoring	Capping	Building Engineering Controls	SVE Outdoor Soil	SVE Under Building	SVE	ISCO+SVE	
		All Properties	#2, #16, #28, #35	#16	#6, #11, #23	#23	SA-6	SA-3, SA-11, SA-12	
Capital Costs	Direct	\$1,099,000	\$419,000	\$124,000	\$1,989,000	\$1,113,000	\$626,000	\$2,985,000	\$8,355,000
	Indirect	\$110,000	\$125,000	\$45,000	\$458,000	\$213,000	\$165,000	\$572,000	\$1,688,000
	Total	\$1,209,000	\$544,000	\$169,000	\$2,447,000	\$1,326,000	\$791,000	\$3,557,000	\$10,043,000
Annual O&M Costs	Year 1 to Year 3 or 4	\$179,000	\$68,000	\$12,000	\$1,236,000	\$791,000	\$392,000	\$4,825,000	\$7,503,000
	Year 5 onward	\$179,000	\$68,000	\$12,000	-	-	\$15,000	\$45,000	\$319,000
Annual O&M Present Worth Costs	Discount rate = 3%, 100 yrs	\$5,643,000	\$2,149,000	\$380,000	\$3,497,000	\$2,237,000	\$1,402,000	\$17,769,000	\$33,077,000
	Discount rate = 5%, 100 yrs	\$3,545,000	\$1,350,000	\$239,000	\$3,366,000	\$2,154,000	\$1,337,000	\$16,950,000	\$28,941,000
	Discount rate = 7%, 100 yrs	\$2,556,000	\$971,000	\$172,000	\$3,244,000	\$2,076,000	\$1,277,000	\$16,192,000	\$26,488,000
Contingency	Discount rate = 3%	\$1,368,000	\$539,000	\$110,000	\$1,189,000	\$713,000	\$534,000	\$9,100,000	\$13,553,000
	Discount rate = 5%	\$949,000	\$379,000	\$82,000	\$1,163,000	\$696,000	\$486,000	\$8,561,000	\$12,316,000
	Discount rate = 7%	\$746,000	\$303,000	\$68,000	\$1,138,000	\$680,000	\$457,000	\$8,157,000	\$11,549,000
Total Present Worth	Discount rate = 3%, 100 yrs	\$8,214,000	\$3,232,000	\$659,000	\$7,133,000	\$4,276,000	\$3,201,000	\$31,848,000	\$58,563,000
	Discount rate = 5%, 100 yrs	\$5,715,000	\$2,273,000	\$490,000	\$6,976,000	\$4,176,000	\$2,912,000	\$29,962,000	\$52,504,000
	Discount rate = 7%, 100 yrs	\$4,529,000	\$1,818,000	\$409,000	\$6,829,000	\$4,082,000	\$2,739,000	\$28,549,000	\$48,955,000

## Notes/Assumptions

1. The costs presented here were developed in the Soil and NAPL FS dated January 2010.
2. The total cost does not include remediation of site-related contamination encountered in the future.
3. This cost estimate assumes 20% contingency for all remedy components except for NAPL related ISCO+SVE that uses 40%.
4. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-6: Cost Estimate, Institutional Controls**

Property	Parcel #	IC Layers						Capital Costs			O&M Costs		Contingency	Total Present Worth
		1	2	3	4A	4B	5	Direct	Indirect (10%)	Total	Annual	Present Worth O&M		
1	7351-031-018	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
2	7351-031-020	✓	✓	✓	✓	✓		\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
3	7351-031-031	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
4	7351-031-007	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
5	7351-033-017	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
6	7351-033-022	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
7	7351-033-024	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
8	7351-033-026	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
9	7351-033-027	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
10	7351-033-030	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
11	7351-033-034	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
12	7351-033-040	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
13	7351-033-045	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
14	7351-033-009	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
15	7351-033-900	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
16	7351-034-015 7351-034-050 7351-034-056	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
17	7351-034-039	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
18	7351-034-041	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
19	7351-034-043	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
20	7351-034-045	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
21	7351-034-047	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
22	7351-034-052	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
23	7351-034-057	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
24	7351-034-058	✓	✓	✓	✓		✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-6: Cost Estimate, Institutional Controls**

Property	Parcel #	IC Layers						Capital Costs			O&M Costs		Contingency	Total Present Worth
		1	2	3	4A	4B	5	Direct	Indirect (10%)	Total	Annual	Present Worth O&M		
25	7351-034-066	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
26	7351-034-067	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
27	7351-034-068	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
28	7351-034-069	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
30	7351-034-072	✓	✓	✓	✓	✓	✓	\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
31	7351-034-073	✓	✓					\$5,000	\$500	\$5,500	\$2,175	\$43,000	\$10,000	\$59,000
32	7351-034-076	✓	✓	✓	✓	✓	✓	\$34,000	\$3,400	\$37,400	\$3,275	\$65,000	\$20,000	\$123,000
33	7351-034-803	✓	✓	✓	✓	✓	✓	\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
35	Magellan Dr	✓	✓	✓	✓	✓	✓	\$44,000	\$4,400	\$48,400	\$3,775	\$75,000	\$25,000	\$148,000
36	Pacific Gateway N	✓	✓	✓	✓			\$24,000	\$2,400	\$26,400	\$2,775	\$55,000	\$16,000	\$98,000
All unnumbered properties	35 Properties	✓	✓					\$175,000	\$17,500	\$192,500	\$76,125	\$1,511,000	\$341,000	\$2,045,000
<b>Total Present Worth</b>								<b>\$1,099,000</b>	<b>\$110,000</b>	<b>\$1,209,000</b>	<b>\$179,000</b>	<b>\$3,545,000</b>	<b>\$949,000</b>	<b>\$5,715,000</b>

## Notes/Assumptions:

1. Capital and O&M costs for each property are calculated by adding capital and O&M costs for each IC layer applied to the property.
2. Present worth calculated assuming 5% discount rate, 100 years. Total cost includes 10% indirect capital cost + 20% contingency
3. Six of the unnumbered parcels listed are roadway segments that are considered equivalent to properties for this cost estimate.

**TABLE 12-7: Cost Estimate, Capping, Properties 2, 16, 28, 35**

Cost Type	Item No.	Description	Units	Property 2			Property 16			Property 28			Property 35			Total Estimated Cost
				Estimated Quantity	Unit Cost	Extended Cost	Estimated Quantity	Unit Cost	Extended Cost	Estimated Quantity	Unit Cost	Extended Cost	Estimated Quantity	Unit Cost	Extended Cost	
Direct Capital Costs	1	Site Investigation/Delineation	ls	1	\$20,000	\$20,000	1	\$31,100	\$31,000	1	\$13,000	\$13,000	1	\$18,000	\$18,000	\$82,000
	2	Site preparation	sf	4,900	\$0	\$2,000	23,600	\$0	\$9,000	2,500	\$0	\$1,000	7,500	\$0	\$3,000	\$15,000
	3	Site Setup, Equipment Mobilization	sf	4,900	\$1	\$4,000	23,600	\$1	\$18,000	2,500	\$1	\$2,000	7,500	\$1	\$6,000	\$30,000
	4	Slurry Seal over Existing Asphalt Pavement	sf	4,900	\$5	\$25,000	23,600	\$5	\$118,000	2,500	\$5	\$13,000	7,500	\$5	\$38,000	\$194,000
	5	Parcel Cleanup/Demobilization	ls	1	\$3,000	\$3,000	1	\$7,000	\$7,000	1	\$3,000	\$3,000	1	\$3,000	\$3,000	\$16,000
	6	Remedial Action Monitoring	day	1	\$2,000	\$2,000	5	\$2,000	\$10,000	1	\$2,000	\$2,000	1	\$2,000	\$2,000	\$16,000
	7	Remediation Documentation/Reporting	ls	1	\$10,000	\$10,000	1	\$14,000	\$14,000	1	\$10,000	\$10,000	1	\$10,000	\$10,000	\$44,000
	8	Health and Safety, ODCs	ls	1	\$5,000	\$5,000	1	\$7,000	\$7,000	1	\$5,000	\$5,000	1	\$5,000	\$5,000	\$22,000
<b>Direct Capital Costs Subtotal</b>				<b>\$ 71,000</b>			<b>\$ 214,000</b>			<b>\$ 49,000</b>			<b>\$ 85,000</b>			<b>\$419,000</b>
Indirect Capital Costs	1	Engineering, Design, and Permitting		15%	\$71,000	\$11,000	12%	\$214,000	\$26,000	15%	\$49,000	\$7,000	15%	\$85,000	\$13,000	\$57,000
	2	Project Management, Agency Reporting and Coordination		8%	\$71,000	\$6,000	6%	\$214,000	\$13,000	8%	\$49,000	\$4,000	8%	\$85,000	\$7,000	\$30,000
	3	Construction Management		10%	\$71,000	\$7,000	8%	\$214,000	\$17,000	10%	\$49,000	\$5,000	10%	\$85,000	\$9,000	\$38,000
	<b>Indirect Capital Costs Subtotal</b>				<b>\$ 24,000</b>			<b>\$ 56,000</b>			<b>\$ 16,000</b>			<b>\$ 29,000</b>		
O&M Costs	1	Cap Maintenance and Repair		1	\$9,000	\$9,000	1	\$40,000	\$40,000	1	\$4,000	\$4,000	1	\$15,000	\$15,000	\$68,000
<b>Totals</b>	<b>Total Direct + Indirect Capital Costs</b>															<b>\$544,000</b>
	<b>Present Worth of Cap (5%, 100 Years) O&amp;M Costs</b>															<b>\$1,350,000</b>
	<b>Contingency (20% of total project cost)</b>															<b>\$379,000</b>
	<b>Total Present Worth</b>															<b>\$2,273,000</b>

Notes/Assumptions:

1. Remediation areas are already paved with asphalt and assumes the use of the existing pavement with periodic resurfacing with a slurry seal every 10 years starting at Year 5 and asphalt replacement every 10 years starting at Year 10.
2. The O&M cost for Cap Maintenance and Repair assumes an annualized average cost to represent the assumed slurry sealing and asphalt replacement schedule at a 10-year frequency. This approach uses the present worth formula for a stream of equal annual costs and results in an approximate present worth cost estimate that is consistent with the approach used in the Feasibility Study.
3. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-8: Cost Estimate, Building Engineering Controls, Property 16**

Cost Type	Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs	1	Site Investigation/Delineation	1	ls	\$18,000	\$18,000
	2	Site preparation	10,800	sf	\$0	\$4,000
	3	Site Setup, Equipment Mobilization	10,800	sf	\$1	\$8,000
	4	Subslab Venting System under building (installed)	10,800	sf	\$5	\$54,000
	5	Install Vapor Monitoring Points inside building	27	ea	\$500	\$14,000
	6	Parcel Cleanup/Demobilization	1	ls	\$3,000	\$3,000
	7	Remedial Action Monitoring	7	day	\$2,000	\$14,000
	8	Remediation Documentation/Reporting	1	ls	\$6,000	\$6,000
	9	Health and Safety, Equipment Rentals, ODCs	1	ls	\$3,000	\$3,000
<b>Direct Capital Costs Subtotal</b>						<b>\$124,000</b>
Indirect Capital Costs	1	Engineering, Design, and Permitting	15%	of	\$124,000	\$19,000
	2	Project Management and Coordination	10%	of	\$124,000	\$13,000
	3	Construction Management	10%	of	\$124,000	\$13,000
<b>Indirect Capital Costs Subtotal</b>						<b>\$45,000</b>
Annual O&M Costs	1	SSV periodic monitoring, operation, maintenance	1	year	\$12,000	\$12,000
	<b>Annual O&amp;M Subtotal</b>					
<b>Totals</b>	<b>Total Direct + Indirect Capital Cost</b>					<b>\$169,000</b>
	<b>Present Worth (5%, 100 Years) O&amp;M Costs</b>					<b>\$239,000</b>
	<b>Contingency (20% of total cost)</b>					<b>\$82,000</b>
	<b>Total Present Worth</b>					<b>\$490,000</b>

## Notes/Assumptions:

1. Sub-Slab Venting (SSV) is assumed as the selected BEC for the northwest corner of the building (10,800 sf).
2. SSV assumes piping laid in trenches inside building.
3. SSV system includes fan and carbon adsorbers as vapor control system.
4. SSV O&M includes periodic monitoring of vapor control system.
5. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

**TABLE 12-9: Cost Estimate, Sve For Voc-Impacted Soil, Properties 6, 11, AND 23**

Cost Type	Item No.	Description	Unit	Property 23			Property 6			Property 11			TOTAL
				Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	
Direct Capital Costs	1	Site Investigation/Delineation	ls	1	\$88,600	\$89,000	1	\$108,200	\$108,200	1	\$16,500	\$16,500	\$213,000
	2	Site preparation/Geophysical Survey	sf	39,300	\$1	\$31,000	29,400	\$1	\$23,520	4,500	\$1	\$3,600	\$59,000
	3	Site Setup, Equipment Mobilization/Demobilization	sf	39,300	\$1	\$49,000	29,400	\$1	\$36,750	4,500	\$1	\$5,625	\$92,000
	4	SVE Vertical Wells (V-SVE)	ea	41	\$5,000	\$205,000	35	\$5,000	\$175,000	8	\$5,000	\$40,000	\$420,000
	5	Install Well Headworks/Vault	ea	41	\$1,500	\$61,500	35	\$1,500	\$52,500	8	\$1,500	\$12,000	\$126,000
	6	Install Outdoor Vapor Monitoring Points	ea	18	\$2,000	\$36,000	10	\$2,000	\$20,000	2	\$2,000	\$4,000	\$60,000
	7	Trenching, Piping, Backfill, Resurfacing	lf	2,100	\$30	\$63,000	2,500	\$30	\$75,000	400	\$30	\$12,000	\$150,000
	8	Equipment Pad/Enclosure Fence/Gas, Electricity Hookup	ea	1	\$37,000	\$37,000	1	\$50,000	\$50,000	1	\$50,000	\$50,000	\$137,000
	9	Control and Instrumentation	ls	1	\$5,000	\$5,000	1	\$7,000	\$7,000	1	\$4,000	\$4,000	\$16,000
	10	Misc VETS Equipment (fittings, valves, manifold, tanks, pumps etc.)	ls	1	\$37,000	\$37,000	1	\$40,000	\$40,000	1	\$10,000	\$10,000	\$87,000
	11	SVE System Installation and Startup	ea	1	\$37,000	\$37,000	1	\$50,000	\$50,000	1	\$30,000	\$30,000	\$117,000
	12	SVE Emissions Treatment System (Thermal/Cat Ox)	ea	1	\$49,000	\$49,000	1	\$75,000	\$75,000	1	\$50,000	\$50,000	\$174,000
	13	SVE Emissions Treatment System, (granular activated carbon [GAC]) Chlorinated VOCs 100 cubic feet per minute(cfm)	ea	1	\$25,000	\$25,000	0	\$0	\$0	0	\$0	\$0	\$25,000
	14	Soil Confirmation Sampling and Analyses	samples	43	\$1,200	\$51,600	40	\$800	\$32,000	15	\$750	\$11,250	\$95,000
	15	Air Monitoring/Sampling	days	12	\$2,500	\$30,000	15	\$2,500	\$37,500	6	\$2,500	\$15,000	\$83,000
	16	Remediation Documentation/Reporting	ea	1	\$12,000	\$12,000	1	\$19,000	\$19,000	1	\$15,000	\$15,000	\$46,000
	17	Site Closure, decommissioning, well abandonment	ls	1	\$10,000	\$10,000	1	\$20,000	\$20,000	1	\$20,000	\$20,000	\$50,000
	18	Health and Safety, Equipment Rentals, ODCs	ls	1	\$10,000	\$10,000	1	\$16,000	\$16,000	1	\$13,000	\$13,000	\$39,000
<b>Direct Capital Cost Subtotal</b>						<b>\$839,000</b>	<b>\$838,000</b>			<b>\$312,000</b>			<b>\$1,989,000</b>
Indirect Capital Costs	1	Engineering, Design, and Permitting		8%	\$839,000	\$67,120	12%	\$838,000	\$100,560	12%	\$312,000	\$37,440	\$205,000
	2	Project Management, Agency Reporting and Coordination		5%	\$839,000	\$41,950	6%	\$838,000	\$50,280	6%	\$312,000	\$18,720	\$111,000
	3	Construction Management		6%	\$839,000	\$50,340	8%	\$838,000	\$67,040	8%	\$312,000	\$24,960	\$142,000
	<b>Indirect Capital Cost Subtotal</b>						<b>\$159,000</b>	<b>\$218,000</b>			<b>\$81,000</b>		
O&M Costs	1	SVE periodic monitoring, operation, maintenance	mths	12	\$12,000	\$144,000	12	\$5,000	\$60,000	12	\$4,000	\$48,000	\$252,000
	2	Fuel	mths	12	\$8,000	\$96,000	12	\$7,000	\$84,000	12	\$3,000	\$36,000	\$216,000
	3	Electricity	mths	12	\$4,000	\$48,000	12	\$2,200	\$26,400	12	\$1,300	\$15,600	\$90,000
	4	Maintenance (hardware, filters, gauges, blower, etc.)	mths	12	\$3,000	\$36,000	12	\$2,000	\$24,000	12	\$1,000	\$12,000	\$72,000
	5	Carbon - Vapor Phase (chlor-SVE)	mths	12	\$8,000	\$96,000	0	\$0	\$0	0	\$0	\$0	\$96,000
	6	VETS Influent/Effluent Monitoring / Lab Costs	mths	12	\$4,000	\$48,000	12	\$5,000	\$60,000	12	\$1,500	\$18,000	\$126,000
	7	Project Management/Consultant support/Quarterly Reports	mths	12	\$6,000	\$72,000	12	\$6,000	\$72,000	12	\$4,000	\$48,000	\$192,000
	8	Waste/Water Disposal	mths	12	\$4,000	\$48,000	12	\$3,000	\$36,000	12	\$1,000	\$12,000	\$96,000
	9	Misc: Equipment rentals / photoionization detector (PID)/ flame ionization detector (FID) / other direct costs (ODCs)	mths	12	\$2,000	\$24,000	12	\$3,000	\$36,000	12	\$3,000	\$36,000	\$96,000
	<b>Annual O&amp;M Costs Subtotal</b>						<b>\$612,000</b>			<b>\$398,000</b>			<b>\$226,000</b>

**TABLE 12-9: Cost Estimate, Sve For Voc-Impacted Soil, Properties 6, 11, AND 23**

Cost Type	Item No.	Description	Unit	Property 23			Property 6			Property 11			TOTAL
				Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	
Totals	Direct + Indirect Capital Total											\$2,447,000	
	Present Worth of Operation and Maintenance Costs (5%, 3 Years)											\$3,366,000	
	Contingency (20% of total project cost)											\$1,163,000	
	Total Present Worth											\$6,976,000	

## Notes/Assumptions:

1. Assumes vertical SVE wells screened between 5 and 15 feet bgs at a well spacing of 30 feet for each property.
2. SVE systems sized at 750 cfm at property 23; 500 cfm at Property 6, and 400 cfm at Property 11.
3. SVE operation for 3 years was assumed for all three properties.
4. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-10: Cost Estimate, SVE for VOC-Impacted Soil Under Building, Property 23**

Cost Type	Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs	1	Site Investigation/Delineation	1	ls	\$197,000	\$197,000
	2	Site Preparation/Geophysical	62,250	sf	\$1	\$50,000
	3	Site Setup, Equipment Mobilization/Demobilization	62,250	sf	\$1	\$78,000
	4	SVE Horizontal Wells (H-SVE)	14	ea	\$25,000	\$350,000
	5	Install Well Headworks/Vault	14	ea	\$1,500	\$21,000
	6	Trenching, Piping, Backfill, Resurfacing	700	lf	\$30	\$21,000
	7	Equipment Pad/Enclosure Fence/Gas, Electricity Hookup	1	ea	\$50,000	\$50,000
	8	Control and Instrumentation	1	ls	\$9,000	\$9,000
	9	Misc VETS Equipment (fittings, valves, manifold, tanks, pumps etc.)	900	lf	\$10	\$9,000
	10	SVE System Installation and Startup	1	ea	\$50,000	\$50,000
	11	SVE Emissions Treatment System (Thermal/Cat Ox) 1500 cfm	1	ea	\$130,000	\$130,000
	12	Soil Confirmation Sampling and Analyses	72	samples	\$600	\$43,000
	13	Air Monitoring/Sampling	30	days	\$2,500	\$75,000
	14	Remediation Documentation/Reporting	1	ea	\$10,000	\$10,000
	15	Site Closure, decommissioning, well abandonment	1	ls	\$10,000	\$10,000
	16	Health and Safety, Equipment Rentals, ODCs	1	ls	\$10,000	\$10,000
<b>Direct Capital Subtotal</b>						<b>\$1,113,000</b>
Indirect Capital Costs	1	Engineering, Design, and Permitting	8%	of	\$1,113,000	\$90,000
	2	Project Management, Agency Reporting and Coordination	5%	of	\$1,113,000	\$56,000
	3	Construction Management	6%	of	\$1,113,000	\$67,000
<b>Indirect Capital Subtotal</b>						<b>\$213,000</b>
O&M Costs	1	SVE periodic monitoring, operation, maintenance	12	mths	\$10,000	\$120,000
	2	Fuel	12	mths	\$21,000	\$252,000
	3	Electricity	12	mths	\$7,900	\$95,000
	4	Maintenance (hardware, filters, gauges, blower, etc.)	12	mths	\$5,000	\$60,000
	5	VETS Influent/Effluent Monitoring / Lab Costs	12	mths	\$6,000	\$72,000
	6	Project Management/Consultant support/Quarterly Reports	12	mths	\$10,000	\$120,000
	7	Waste/Water Disposal	12	mths	\$3,000	\$36,000
	8	Misc: Equipment rentals / PID / FID / ODCs	12	mths	\$3,000	\$36,000
<b>SVE Annual Operation and Maintenance Subtotal</b>						<b>\$791,000</b>



**TABLE 12-10: Cost Estimate, SVE for VOC-Impacted Soil Under Building, Property 23**

Cost Type	Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
<b>Totals</b>	<b>Direct + Indirect Capital Total</b>					<b>\$1,326,000</b>
	<b>SVE Present Worth of Operation and Maintenance Costs (5%, 3 Years)</b>					<b>\$2,154,000</b>
	<b>Contingency (20% of total project cost)</b>					<b>\$696,000</b>
	<b>Total Capital and O&amp;M Cost</b>					<b>\$4,176,000</b>

## Notes/Assumptions:

- 1 Assumes 14 horizontal SVE wells installed at 5-10 feet bgs with 150 feet average screen length.
- 2 Assumes thermal oxidizer treatment system with 750 standard cubic feet per minute (scfm), positive displacement blower.
- 3 Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-11: Cost Estimate, SVE for NAPL SA-6**

Cost Type	Item	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs	1	Site Investigation/Delineation	1	ls	\$152,000	\$152,000
	2	Mobilization/Demobilization	33,000	sf	\$1	\$42,000
	3	Electrical Service/ hookup/Utilities	1	ls	\$25,000	\$25,000
	4	Site Preparation/Geophysical	33,000	sf	\$1	\$27,000
	5	SVE Wells	9	ea	\$6,000	\$54,000
	6	Well Headworks/Vault (24" traffic rated)	9	ea	\$3,000	\$27,000
	7	VETS Installation and Startup	1	ls	\$90,000	\$90,000
	8	SVE Blower + Thermal Oxidizer; 400 cfm	1	ls	\$80,000	\$80,000
	9	Control and Instrumentation	1	ls	\$6,000	\$6,000
	10	Misc Treat System: Tanks, Piping, Pumps, Fittings	1	ls	\$15,000	\$15,000
	11	Trenching, Piping, Backfill and Resurfacing	600	lf	\$30	\$18,000
	12	Equipment Pad/Enclosure/Fence	1	ea	\$20,000	\$20,000
	13	Post Treatment Sampling + Analysis	14	borings	\$5,000	\$70,000
	<b>Direct Capital Subtotal</b>					
Indirect Capital Costs	1	Engineering, Design, and Permitting	12%	of	\$626,000	\$76,000
	2	Project Management, Agency Reporting/Coordination	6%	of	\$626,000	\$38,000
	3	Construction Management	8%	of	\$626,000	\$51,000
	<b>Indirect Capital Subtotal</b>					
Annual O&M Costs	1	Fuel: Natural Gas (Thermal Oxidizer)	12	mths	\$8,000	\$96,000
	2	Electricity: SVE blower, misc equip	12	mths	\$2,700	\$32,000
	3	Operations & Maintenance	12	mths	\$5,000	\$60,000
	4	Maintenance (hardware, filters, monitoring equipment)	12	mths	\$1,000	\$12,000
	5	Vapor Treatment System Influent/Effluent Monitoring/Lab Costs	12	mths	\$4,500	\$54,000
	6	Project Management/Consultant support/Reports	12	mths	\$5,000	\$60,000
	7	Waste/NAPL/Water Disposal	12	mths	\$2,000	\$24,000
	8	Health & Safety/Air Monitoring	1	ls	\$3,000	\$3,000
	9	Miscellaneous: Equipment rentals, PID/FID	12	mths	\$3,000	\$36,000
	<b>SVE Annual O&amp;M Subtotal</b>					
<b>Totals</b>	<b>Total Direct + Indirect Capital Cost</b>					<b>\$791,000</b>
	<b>SVE Present Worth of Operation and Maintenance Costs (5%, 4 Years)</b>					<b>\$1,337,000</b>
	<b>Present Worth of Monitoring Costs (5%, 100 Years)</b>					<b>\$298,000</b>
	<b>20% Contingency</b>					<b>\$486,000</b>
	<b>Total Capital and O&amp;M Cost Present Worth</b>					<b>\$2,912,000</b>

**TABLE 12-11: Cost Estimate, SVE for NAPL SA-6**

Cost Type	Item	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
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Notes/Assumptions:

1. Assumes 9 vertical SVE wells screened from 30-50 feet bgs
2. Assumes a 400 scfm thermal oxidizer vapor treatment system with positive displacement blower.
3. Assumes SVE operation for 4 years.
4. Present worth of groundwater monitoring costs based on \$15,000 annual O&M cost/property
5. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

**TABLE 12-12: Cost Estimate, ISCO and SVE for SA-3, SA-1, and SA-12**

Cost Type	Item	Description	Unit	SA-3			SA-11			SA-12			TOTAL COST
				Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	
Direct Capital Costs	1	Site Investigation/Delineation	ls	1	\$205,000	\$205,000	1	\$177,000	\$177,000	1	\$115,000	\$115,000	\$497,000
	2	Mobilization/Demobilization	sf	50,000	\$2	\$75,000	41,400	\$2	\$63,000	22,500	\$2	\$34,000	\$171,000
	3	Electrical Service/Hookup/Utilities	ls	1	\$40,000	\$40,000	1	\$30,000	\$30,000	1	\$30,000	\$30,000	\$100,000
	4	Site Preparation/Geophysical survey	sf	50,000	\$1	\$40,000	41,400	\$1	\$34,000	22,500	\$1	\$18,000	\$92,000
	5	SVE wells	ea	28	\$5,500	\$154,000	20	\$5,500	\$110,000	12	\$5,500	\$66,000	\$330,000
	6	Vapor Extraction Sentry Wells (outdoor)	ea	0	\$6,000	\$0	6	\$6,000	\$36,000	4	\$6,000	\$24,000	\$60,000
	7	Temperature Monitoring Well Points (outdoor)	ea	8	\$10,000	\$80,000	7	\$10,000	\$70,000	5	\$10,000	\$50,000	\$200,000
	8	Well Headworks/Vault	ea	36	\$3,000	\$108,000	33	\$3,000	\$99,000	21	\$3,000	\$63,000	\$270,000
	9	Treatment System Installation and Startup	ls	1	\$125,000	\$125,000	1	\$100,000	\$100,000	1	\$75,000	\$75,000	\$300,000
	10	Misc. Treatment Sys Equipment: tanks, piping	ls	1	\$40,000	\$40,000	1	\$30,000	\$30,000	1	\$25,000	\$25,000	\$95,000
	11	SVE Equipment (Blower, emissions control)	ls	1	\$120,000	\$120,000	1	\$90,000	\$90,000	1	\$75,000	\$75,000	\$285,000
	12	Control and Instrumentation	ls	1	\$21,000	\$21,000	1	\$16,000	\$16,000	1	\$13,000	\$13,000	\$50,000
	13	Trenching, Piping, Backfill and Resurfacing	lf	1,800	\$50	\$90,000	1,300	\$50	\$65,000	700	\$50	\$35,000	\$190,000
	14	Equipment Pad/Enclosure/Fence	ea	1	\$40,000	\$40,000	1	\$40,000	\$40,000	1	\$40,000	\$40,000	\$120,000
	15	Post Treatment Sampling + Analysis	boring	20	\$5,000	\$100,000	16	\$5,000	\$80,000	9	\$5,000	\$45,000	\$225,000
<b>Direct Capital Subtotals</b>						<b>\$1,238,000</b>	<b>\$1,040,000</b>			<b>\$708,000</b>			<b>\$2,985,000</b>
Indirect Capital Costs	1	Engineering, Design, and Permitting		8%	\$1,238,000	\$100,000	8%	\$1,040,000	\$84,000	8%	\$708,000	\$57,000	\$241,000
	2	Project Management, Reporting, Coordination		5%	\$1,238,000	\$62,000	5%	\$1,040,000	\$52,000	5%	\$708,000	\$36,000	\$150,000
	3	Construction Management		6%	\$1,238,000	\$75,000	6%	\$1,040,000	\$63,000	6%	\$708,000	\$43,000	\$181,000
<b>Indirect Capital Subtotals</b>						<b>\$237,000</b>	<b>\$199,000</b>			<b>\$136,000</b>			<b>\$572,000</b>
SVE O&M Costs	1	Fuel: Natural Gas	mths	12	\$8,000	\$96,000	12	\$5,000	\$60,000	12	\$4,000	\$48,000	\$204,000
	2	Electricity/Utilities	mths	12	\$3,200	\$38,400	12	\$2,200	\$26,400	12	\$1,600	\$19,200	\$84,000
	3	SVE System Operation and Monitoring Labor	units	12	\$8,000	\$96,000	12	\$8,000	\$96,000	12	\$6,000	\$72,000	\$264,000
	4	SVE Maintenance Materials and Expenses	mths	12	\$3,000	\$36,000	12	\$3,000	\$36,000	12	\$2,000	\$24,000	\$96,000
	5	SVE Treatment System Monitoring/Lab Costs	mths	12	\$5,000	\$60,000	12	\$6,000	\$72,000	12	\$4,000	\$48,000	\$180,000
	6	Project Management/Consultant support/Reports	mths	12	\$5,000	\$60,000	12	\$5,000	\$60,000	12	\$5,000	\$60,000	\$180,000
	7	Waste/Water Disposal	mths	12	\$1,750	\$21,000	12	\$1,250	\$15,000	12	\$1,250	\$15,000	\$51,000
	8	Health and Safety (H&S)/Air Monitoring	ls	1	\$4,000	\$4,000	1	\$4,000	\$4,000	1	\$4,000	\$4,000	\$12,000
	9	Miscellaneous: Equipment rentals, PID/FID, Transducers	mths	12	\$3,000	\$36,000	12	\$2,250	\$27,000	12	\$2,250	\$27,000	\$90,000
<b>SVE Annual Operation and Maintenance Subtotal</b>						<b>\$448,000</b>	<b>\$396,000</b>			<b>\$317,000</b>			<b>\$1,161,000</b>

**TABLE 12-12: Cost Estimate, ISCO and SVE for SA-3, SA-1, and SA-12**

Cost Type	Item	Description	Unit	SA-3			SA-11			SA-12			TOTAL COST
				Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	Estimated Quantity	Unit Cost	Extension	
ISCO O&M Costs	1	Electricity/Utilities	mths	12	\$1,300	\$15,600	12	\$800	\$9,600	12	\$600	\$7,200	\$32,000
	2	ISCO Fentons Chemicals: H2O2, Iron soln, acids	events	2	\$540,000	\$1,080,000	2	\$210,000	\$420,000	2	\$210,000	\$420,000	\$1,920,000
	3	ISCO Vendor Labor+Equipment rental	events	2	\$222,600	\$445,200	2	\$102,000	\$204,000	2	\$130,000	\$260,000	\$909,000
	4	ISCO Consultant Oversight, Monitoring	events	2	\$60,000	\$120,000	2	\$27,500	\$55,000	2	\$35,000	\$70,000	\$245,000
	5	ISCO Soil and Groundwater Sampling/Lab Costs	rounds	1	\$70,000	\$70,000	1	\$60,000	\$60,000	1	\$50,000	\$50,000	\$180,000
	6	Project Management/Consultant support/Reports	mths	12	\$5,000	\$60,000	12	\$5,000	\$60,000	12	\$5,000	\$60,000	\$180,000
	7	Waste/Water Disposal	mths	12	\$1,750	\$21,000	12	\$1,250	\$15,000	12	\$1,250	\$15,000	\$51,000
	8	H&S/Air Monitoring	ls	1	\$4,000	\$4,000	1	\$4,000	\$4,000	1	\$4,000	\$4,000	\$12,000
	9	Miscellaneous: Equipment rentals, PID/FID, Transducers	mths	12	\$3,000	\$36,000	12	\$2,250	\$27,000	12	\$2,250	\$27,000	\$90,000
<b>ISCO Annual Operation and Maintenance Subtotal</b>						<b>\$1,852,000</b>	<b>\$855,000</b>			<b>\$914,000</b>			<b>\$3,619,000</b>
<b>Totals</b>	<b>Direct + Indirect Capital Total</b>												<b>\$3,557,000</b>
	<b>Present Worth of SVE Operation and Maintenance Costs (5%, 4 Years)</b>												<b>\$4,117,000</b>
	<b>Present Worth of ISCO Operation and Maintenance Costs (5%, 4 Years)</b>												<b>\$12,833,000</b>
	<b>Present Worth of Groundwater Monitoring (5%, 100 Years)</b>												<b>\$894,000</b>
	<b>40% Contingency</b>												<b>\$8,561,000</b>
<b>Total Present Worth</b>												<b>\$ 29,962,000</b>	

Notes/Assumptions:

1. Direct push injection of Fenton's Reagent was assumed, for cost estimating purposes, at SA-3, SA-11 and SA-12 using a total of 192, 152 and 75 injection locations respectively.
2. Total oxidant dosages for SA-3, SA-11 and SA-12 assumed to be 2.88 million gallons for SA-3 and 1.12 million gallons each for SA-11 and SA-12 of 12.5% hydrogen peroxide over a 4-year period.
3. Assumes SVE systems sized at 750 cfm for SA-3; 500 cfm for SA-11, and 400 cfm for SA-12.
4. Present worth of groundwater monitoring costs based on \$15,000 annual O&M cost/property
5. Some existing RI data may no longer be representative of current site conditions due to biodegradation of contaminants through time. The extent of remedial action will be based on conditions present at the time of remedy design and implementation, and actual costs may vary from the estimates presented in the table.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-13: Institutional Controls Cost Summary**

Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost/ Parcel	Estimated Total Cost	Comments
<b>Implementation Costs</b>						
<b>Layer 1 (Applies to all 69 Parcels) <sup>1</sup></b>						
Federal/State Registries	1	per site	\$250	\$250	\$17,250	Includes listing applicable properties on the FINDS, ICs, and Eng. Controls databases.
Web-Based Information	1	per site	\$500	\$500	\$34,500	Includes development and implementation of a web-based information system.
Private Sector Land Activity Monitoring Alert Services	1	per site	\$860	\$860	\$59,340	Includes \$20,000 for the initial year of monitoring, \$14,500 for coordination of implementation, and \$25,000 for initial year responses.
Private Sector IC Monitoring, Reporting, and Compliance Support	1	per site	\$500	\$500	\$34,500	Includes development of a reporting format, review of the initial year of IC effectiveness, and the initial annual report to agencies.
Implementation Cost Total (Layer 1)				\$2,110	\$145,590	
<b>Layer 2 (Applies to 43 of the 69 Parcels)</b>						
Building Permits	1	per site	\$1,500	\$1,500	\$64,500	Includes coordination with the City of LA to implement program (\$1,000 per site) and review and support costs associated with 4 sites (\$5,000 per site).
Grading/Excavation Permits	1	per site	\$1,500	\$1,500	\$64,500	Includes coordination with the City of LA to implement program (\$1,000 per site) and review and support costs associated with 4 sites (\$5,000 per site).
Layer 2 Implementation Cost Subtotal				\$3,000	\$129,000	
Implementation Cost Total (Layers 1 and 2 Combined)				\$5,110	\$274,590	
<b>Layer 3 (Applies to 29 of the 69 Parcels)</b>						
General Plan footnote (prohibit residential)	1	per site	\$4,000	\$4,000	\$116,000	Includes coordination with the City of LA to place footnote on identified parcel (\$1,500) and parcel owner legal fees (\$2,500) associated with action.
Implementation Cost Total (Layers 1, 2, and 3 Combined)				\$9,110	\$390,590	

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-13: Institutional Controls Cost Summary**

Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost/ Parcel	Estimated Total Cost	Comments
<b>Layer 4A (Applies to 29 of the 69 Parcels)</b>						
Restrictive Covenants (land use covenants)	1	per site	\$15,000	\$15,000	\$435,000	Cost includes technical support and parcel owners legal review/negotiation costs.
Implementation Cost Total (Layers 1, 2, 3, and 4A Combined)				\$24,110	\$825,590	
<b>Layer 4B (Applies to 19 of the 69 Parcels)</b>						
Restrictive Covenant for Engineering Control (if needed), Cap/HVAC/SSV	1	per site	\$10,000	\$10,000	\$190,000	Cost includes additional support and additional parcel owners legal review/negotiations. The reduced cost is based on the bulk of negotiations being performed during Layer 4 negotiations.
Implementation Cost Total (Layers 1, 2, 3, 4A, and 4B Combined)				\$34,110	\$1,015,590	
<b>Layer 5 (Applies to 20 of the 69 Parcels)</b>						
Restrictive Covenant for Groundwater	1	per site	\$10,000	\$10,000	\$200,000	Cost includes technical support and parcel owners legal review/negotiation costs.
Implementation Cost Total (Layers 1, 2, 3, 4A, 4B, and 5 Combined)				\$44,110	\$1,215,590	
<b>Operation and Maintenance Annual Costs</b>						
<b>Layer 1 (Applies to all 69 Parcels)</b>						
Federal/State Registries	1	per site	\$75	\$75	\$5,175	Includes obtaining a database for the entire Site and one hour review time to confirm parcel listing status.
Web-Based Information	1	per site	\$150	\$150	\$10,350	Includes a semi-annual database update including a total of approximately \$5,000 per update event.
Private Sector Land Activity Monitoring Alert Services	1	per site	\$650	\$650	\$44,850	Includes an annual cost of \$20,000 and approximately \$25,000 of support time.
Private Sector IC Monitoring, Reporting, and Compliance Support	1	per site	\$300	\$300	\$20,700	Includes an annual IC review and report to agencies.
O&M Annual Cost Total (Layer 1)				\$1,175	\$81,075	

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-13: Institutional Controls Cost Summary**

Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost/ Parcel	Estimated Total Cost	Comments
<b>Layer 2 (Applies to 43 of the 69 Parcels)</b>						
Building Permits	1	per site	\$500	\$500	\$21,500	Includes interaction with City of LA for an estimated 4 sites with approximately \$5,000 review and support costs associated with each site.
Grading/Excavation Permits	1	per site	\$500	\$500	\$21,500	Includes interaction with City of LA for an estimated 4 sites with approximately \$5,000 review and support costs associated with each site.
Layer 2 O&M Annual Cost Subtotal				\$1,000	\$43,000	
O&M Annual Cost Total (Layers 1 and 2 Combined)				\$2,175	\$124,075	
<b>Layer 3 (Applies to 29 of the 69 Parcels)</b>						
General Plan footnote (prohibit residential)	1	per site	\$100	\$100	\$2,900	Includes an annual General Plan footnote confirmation.
O&M Annual Cost Total (Layers 1,2, and 3 Combined)				\$2,275	\$126,975	
<b>Layer 4A (Applies to 29 of the 69 Parcels)</b>						
Restrictive Covenants (land use covenants)	1	per site	\$500	\$500	\$14,500	Includes property owner interaction/response.
O&M Annual Cost Total (Layers 1, 2, 3, and 4A Combined)				\$2,775	\$141,475	
<b>Layer 4B (Applies to 19 of the 69 Parcels)</b>						
Restrictive Covenant for Engineering Control (if needed), Cap/HVAC/SSV	1	per site	\$500	\$500	\$9,500	Includes property owner interaction/response.
O&M Annual Cost Total (Layers 1, 2, 3, 4A, and 4B Combined)				\$3,275	\$150,975	
<b>Layer 5 (Applies to 20 of the 69 Parcels)</b>						
Restrictive Covenant for Groundwater	1	per site	\$500	\$500	\$10,000	Includes property owner interaction/response.
O&M Annual Cost Total (Layers 1, 2, 3, 4A, 4B, and 5 Combined)				\$3,775	\$160,975	

Note:

1 This ICs costing summary lists 69 parcels compared to 71 parcels in the FS because the EAPC 16 property is composed of three parcels with one facility/owner.



**TABLE 12-14: Plug-in Costs Summary Table for Soil Remediation Technologies, Small, Medium and Large Area Scenarios**

Area Scenarios	Unit Cost <sup>1</sup>		Impacted Soil Area sf	Impacted Soil Volume cy	Total PW <sup>2</sup> Cost \$
	\$/sf	\$/cy			
<b>Capping<sup>3</sup></b>					
<i>New Asphalt Cap</i>					
Small Area	\$230	--	100	--	\$23,000
Medium Area	\$96	--	1000	--	\$96,000
Large Area	\$74	--	10000	--	\$744,000
<i>Slurry Seal</i>					
Small Area	\$200	--	100	--	\$20,000
Medium Area	\$86	--	1000	--	\$86,400
Large Area	\$63	--	10000	--	\$632,000
<b>Excavation<sup>4</sup></b>					
<i>&lt;5 feet bgs (non-VOC, non-Haz)</i>					
Small Area	--	\$2,268	--	10	\$22,680
Medium Area	--	\$907	--	100	\$90,700
Large Area	--	\$555	--	1000	\$555,000
<i>&lt;15 feet bgs (VOC, non-Haz)</i>					
Small Area	--	\$2,700	--	10	\$27,000
Medium Area	--	\$858	--	100	\$85,800
Large Area	--	\$477	--	1000	\$477,000
<i>&lt;15 feet bgs (VOC, 33% RCRA Haz / 33% CAL Haz / 33% Non Haz)</i>					
Small Area	--	\$3,276	--	10	\$32,760
Medium Area	--	\$1,322	--	100	\$132,200
Large Area	--	\$927	--	1000	\$927,000
<b>Soil Vapor Extraction (Outdoor Soil)<sup>5</sup></b>					
Small Area (GAC)	--	\$384	--	100	\$38,400
Medium Area (GAC)	--	\$158	--	1000	\$158,000
Medium Area (CatOx)	--	\$169	--	1000	\$169,000
Large Area (CatOx)	--	\$82	--	10000	\$820,000
<b>Soil Vapor Extraction (Under Building)<sup>6</sup></b>					
Small Area (GAC)	--	\$513	--	100	\$51,300
Medium Area (GAC)	--	\$201	--	1000	\$201,060
Medium Area (CatOx)	--	\$223	--	1000	\$223,000
Large Area (CatOx)	--	\$110	--	10000	\$1,100,000
<b>Building Engineering Control<sup>7</sup></b>					
Small Area	--	\$145	--	100	\$14,500
Medium Area	--	\$65	--	1000	\$65,000
Large Area	--	\$31	--	10000	\$310,000

Notes:

1 Capping uses unit cost in \$/square foot while other technologies use unit cost in \$/cubic yard.

2 Present worth cost includes 20% to 30% contingency depending on technology.

3 Capping considers two scenarios: 1) resurfacing with a slurry seal (liquid asphalt) over existing pavement, or 2) constructing new

**TABLE 12-14: Plug-in Costs Summary Table for Soil Remediation Technologies, Small, Medium and Large Area Scenarios**

Area Scenarios	Unit Cost <sup>1</sup>		Impacted Soil Area	Impacted Soil Volume	Total PW <sup>2</sup> Cost
	\$/sf	\$/cy	sf	cy	\$

4-inch thick asphalt cover. Capping present worth includes costs for long term maintenance indefinitely in the future (assume 100 years).

4 Excavation considers three scenarios: 1) Non-hazardous soil, impacted area < 5 feet bgs, 2) Non-hazardous soil, impacted area < 15 feet bgs, and 3) 33% RCRA hazardous, 33% California hazardous, and 33% Non hazardous soil, hazardous soil, impacted area <15 feet bgs.

5 SVE(OS) assumes operation for 2 years for all areas. Assume SVE emissions treatment system uses granular activated carbon (GAC) for small and medium areas, and Catalytic Oxidizer / Thermal for medium and large area.

6 SVE(UB) assumes use of horizontal wells that are converted to SSV and operated indefinitely (100 years).

7 Building Engineering Control (BEC) assumes SSV system operates indefinitely (100 years). Soil volume (cy) is based on 15 feet bgs depth.

### Discount Rate

The current EPA RI/FS guidance (OSWER 9355.3-01, 1988; and feasibility studies under CERCLA, Interim Final) and the Office of Management and Budget Circular A-94 identify that the present worth cost estimates should use a 30-year timeframe and a 7 percent discount rate. However, subsequent cost estimating guidance (OSWER 9355.0-75, 2000) specifies the conditions when it is appropriate to diverge from the standard. Section 4.1 of the 2000 cost estimating guidance, "Define Period of Analysis," indicates that, in general, the period of analysis should be equivalent to the project duration.

For the Del Amo project, waste will be left in place in perpetuity, at levels exceeding that which is safe for unrestricted use, in 28 separate land parcels (with many separate owners). Calculating the present worth over only 30 years would underestimate the cost of such a remedial alternative. For this reason, the present worth costs are calculated for a 100-year period, which is virtually the same as for perpetuity (less than 0.01 percent difference). However, the present worth factor for 30 years is 15 percent less than 100 years for a discount rate of 7 percent, and 23 percent less for a discount rate of 5 percent. Using a 30-year period would have underrepresented the cost of the IC remedy and exaggerated the cost difference between it and the active remedial alternatives with more costly capital and short-term O&M costs.

Section 4.3 of the 2000 cost estimating guidance, "Select a Discount Rate," states that a 7 percent discount rate should be used because it approximates the marginal pre-tax rate of return on an average investment in the private sector in recent years, and has been adjusted to eliminate the effect of expected inflation. It also states, however, that there may be circumstances in which it would be appropriate to consider the use of a higher or lower discount rate, and that a specific explanation should be provided. For the Del Amo Site, a 5 percent discount was used. A 7 percent rate of return could not be sustained over the extremely long project period (perpetuity). Due to the anticipated cost of the IC program in perpetuity, a more conservative discount rate was used.

Table 12-3 shows the different present worth costs for the selected remedy that result from using different discount rates. The higher rate, 7 percent, is presented along with the 5 percent rate used in the FS and Proposed Plan, in addition to a lower, 3 percent rate for comparison purposes.

## 12.4 Expected Outcome of the Selected Remedy

### 12.4.1 Land and Groundwater Use

Land use at the site is currently commercial/industrial, and is expected to remain so upon completion of remediation. The selected remedy is expected to result in a reduction of the potential risk to current and future users of the land to acceptable levels. Of the 65 properties at the site, only the properties containing Area 16 and 23 are potentially experiencing unacceptable exposures under their current use and configuration. However, potentially unacceptable exposures could occur at additional properties if their use or configuration were to change in the future. The groundwater beneath the Del Amo Site is currently unavailable for use and will remain so after remedy implementation. The groundwater is the subject of a separate OU. The Groundwater ROD selected monitored natural attenuation and containment as the remedy for the groundwater underlying the Del Amo Site. The groundwater ROD also waived the groundwater ARARs on the basis of impracticability for those areas within the designated TI waiver zones but did not waiver ARARs outside those zones. So even after the remedy for this Soil and NAPL ROD is implemented, the groundwater will remain unavailable for use. However, the remedy selected for deep soil and NAPL will address the key source areas that caused the groundwater contamination. Addressing these source areas was a condition of the Groundwater ROD.

The selected remedy remediates seven shallow vadose soil areas, three contaminated with VOCs and four with non-VOCs four deep vadose soil areas with VOCs, and three areas in the submerged zone contaminated with VOC NAPL. The shallow and deep vadose soil areas will be remediated with SVE and the submerged NAPL areas will be remediated with ISCO, resulting in a decrease of the source material causing the groundwater contamination. In addition, the selected remedy will remediate any additional areas of Site-related contamination that may be encountered in the future that are contaminated above action levels for commercial use.

### 12.4.2 Cleanup Goals

The selected remedy includes the following components, as previously described in Section 12.2:

<u>Component</u>	<u>Locations</u>
1. ICs	All Areas, but to varying degrees
2. Capping	Areas 2, 16, 28 and 35
3. Building Engineering Controls (BECs)	Areas 16
4. Shallow Soil SVE outdoors	Areas 6, 11 and 23
5. Shallow Soil SVE beneath building	Area 23
6. Deep Soil SVE	Source Areas 3, 6, 11 and 12
7. ISCO	Source Areas 3, 11 and 12
8. Additional Areas Encountered	

Remediation through excavation, capping, SVE or BECs may additionally occur at areas of Site-related contamination that are encountered in the future through property redevelopment or construction activities.

Cleanup goals associated with each of the remedy components are described below along with their rationale. "Action levels" were described in Section 12.2, which define the location and extent of the areas to be addressed. "Cleanup goals" define the outcome of the remediation - how clean the soil must get, how low the contamination levels must get before the cleanup activity can cease, or in the case of containment (capping), what the containment system must achieve to be considered successful.

Some of the remedial actions will require additional field sampling during the remedial design process, to assist in defining the extent of the remediation. If new analytical data for one or more of the identified areas demonstrate that the described clean-up goal has been met prior to implementation of the remedy through natural attenuation or other mechanisms, the intent of this ROD will have been met and active remediation will not be required.

### 1. Institutional Controls (All Areas)

The ICs component of the remedy does not constitute physical cleanup activities and thus will not be discussed in this section. The goals of the ICs are discussed in Section 12.2.

### 2. Capping (Areas 2, 16, 28 and 35)

The clean-up goal for the four identified areas where capping will be implemented is to prevent direct contact with areas of impacted soil and prevent migration of dust from areas of impacted soil. Since capping is a containment measure and does not involve removal or treatment of impacted soil, there is no clean-up level. (Note that there is an "action level," described in Section 12.2 that defines the necessary extent of the cap). Caps currently exist at each of the four areas in the form of asphalt or concrete covered streets, parking lots, or storage areas. These existing caps will be evaluated during remedial design to determine whether they are sufficient to meet the cleanup goal.

### 3. Building Engineering Controls (Area 16)

BECs will be implemented at Area 16 to address the effects of vapor intrusion from the underlying soil on the existing building. The exact controls to be implemented will be determined during the Remedial Design phase, but it is anticipated that existing or enhanced ventilation measures, building pressurization or sub-slab venting will be considered and applied as appropriate. The goal of the BECs is to prevent unacceptable exposures of Site-related contaminants to building occupants. BECs do not remove or treat impacted soil, so there is no soil clean-up level. The goal of the BECs is exposure prevention rather than removal or treatment of contaminants to a quantified concentration or risk level. The action levels and the procedures for designing the BECs are described in Section 12.2. The goals of the various possible BEC approaches are described below.

The goal of any BEC measure is to reduce the indoor air concentrations of target VOC constituents to either the commercial RSL/CHHSL criteria for indoor air or background, whichever is higher. (accounting for any contributions from other indoor air sources). Indoor air sampling data will be utilized in making this determination. If building pressurization or subslab venting are utilized, additional sampling data to be utilized will include indoor air or subslab pressure measurements. The RSL and CHHSL levels for the known constituents of concern are as follows:

**TABLE 12-15: Cleanup Goal for Indoor Air**

Chemical	California Human Health Screening Level (CHHSL) ( $\mu\text{g}/\text{m}^3$ )	EPA Regional Screening Level (RSL) ( $\mu\text{g}/\text{m}^3$ )
Benzene	0.14	1.6
Chloroform	None	0.53
Tetrachloroethene	0.69	2.10
Trichloroethene	2.04	6.10

**4. SVE in Shallow Vadose Zone Soil Outdoors (Areas 6, 11 and 23)**

The cleanup goal for the shallow outdoor soil away from the building is a VOC concentration for each constituent that does not exceed a non-cancer hazard index of 1.0 and an excess cancer risk of 1E-6 when exposed to receptors outdoors in a commercial-use setting. The cleanup goals are the same as the action levels (see Section 12.2, Part 4). Table 12-16.1 presents the outdoor soil RSL, which is the cleanup goal for SVE in outdoor soil.

**5. SVE in Shallow Vadose Zone Soil Beneath Building (Area 23)**

The cleanup goal for the shallow soil beneath and adjacent to the building is a VOC concentration for each constituent that does not exceed a non-cancer hazard index of 1.0 and an excess cancer risk of 1E-6 when exposed to receptors inside the building in a commercial-use setting. The cleanup goals are the same as the action levels. Table 12-16.2 presents the indoor air RSL, which is the basis for determining the cleanup goals for SVE beneath and adjacent to a building (see Section 12.2, Part 5).

**TABLE 12-16.1: SVE Outdoor Soil Cleanup Goal**

Chemical	Concentration (mg/kg)
Benzene	5.4
Chloroform	1.5
Tetrachloroethene	2.6
Trichloroethene	6.4

**TABLE 12-16.2: Indoor Air RSL**

Chemical	Concentration ( $\mu\text{g}/\text{m}^3$ )
Benzene	1.6
Chloroform	0.53
Tetrachloroethene	2.1
Trichloroethene	3.0

NOTE: For soil away from, not adjacent to building

Shutdown of the SVE system will occur when EPA determines that the clean-up goals (see Table 12-16) have been achieved.

EPA anticipates that procedures for shutdown evaluation will begin after the SVE system influent concentrations have decreased substantially from pretreatment levels and the treatment zone has reached asymptotic mass removal conditions. Testing procedures would then be conducted to ensure that there is not a significant rebound in soil vapor concentrations after shutdown of the system. The decision to permanently shut down the SVE system will be based on achieving target levels or asymptotic mass removal conditions and the lack of significant rebound in soil vapor concentrations after temporary system shutdown. The shutdown metrics, including rebound testing and confirmation sampling procedures will be developed and described during the remedial design process.

After the cleanup goal is attained, a residual risk would still exist if the property were to be used for residential use. Notification of this residual contamination will therefore be made through the institutional controls (which will also prohibit residential use).

**6. SVE in Deep Vadose Zone Soil Areas (Source Areas 3, 6, 11, 12)**

The cleanup goal for the deep soil areas contaminated with VOCs (some in a NAPL state) will be twofold. First, the SVE system must ensure that any VOCs mobilized by the ISCO treatment system in the underlying saturated zone are captured by the deep soil SVE system. Second, the VOCs in the deep vadose soil must be removed to the extent practicable with the SVE technology. The purpose of the contaminant mass reduction goal is to enhance the groundwater remedy rather than to achieve a quantifiable reduction in risk. The effectiveness of the SVE system will be assessed through monitoring key parameters in the soil and within the SVE system, both during extraction operations and during times of system shut-down. Such parameters include, but are not limited to, vacuum pressure, VOC concentrations, oxygen concentrations, and carbon dioxide concentrations. Measuring vacuum pressure

in the soil can enable EPA to determine whether a capture zone has been established and maintained around the ISCO treatment area. Measuring contaminant concentrations in the soil gas can determine whether rebound is occurring. A lack of rebound indicated by long-term decreases in concentrations, and a decreasing extent of persistent concentrations, can indicate that SVE has been effective.

Monitoring will include both process monitoring and performance monitoring. Process monitoring will ensure the appropriate application of the technology and will enable adjustments to focus on areas with higher concentrations. Performance monitoring will ensure VOC emission standards are achieved as well as indicate when contaminant concentrations decrease and stabilize sufficiently below baseline levels for a sustained period, which would signal a mass removal.

The clean-up goal will have been met when EPA determines that each of the following conditions has been documented through the monitoring data:

- (1) SVE has been conducted with significant reductions in soil gas VOC concentrations;
- (2) Asymptotic conditions have been reached (only slight further reductions in concentrations are being achieved through continued SVE treatment ); and
- (3) VOC concentrations do not significantly increase when treatment is stopped (no meaningful rebound is occurring) beyond the zone affected by off-gassing from the water table.

#### **7. ISCO in Submerged NAPL Areas (Source Areas 3, 11, 12)**

The cleanup goal for the NAPL in the submerged areas is to remove as much NAPL mass as practicable with the ISCO technology, from the SA-3, SA-11, and SA-12 areas, covering approximately 110,000 to 188,000 square feet of heavily impacted soil and groundwater in the unsaturated column from ground surface to groundwater and approximately 25 feet into the saturated zone. Approximately 40 to 50 percent of the contaminant mass at these three areas is expected to be removed by chemical oxidation. The remediation strategy is to continue the remediation until the contaminant concentrations have diminished sufficiently, and there is relatively little change in site conditions with each successive application (the concept of “diminishing returns”).

The ISCO remedy will have reached the clean-up goal, be deemed complete, and will be terminated when EPA, in consultation with DTSC, determines that the remediation has reached the point of diminishing returns (i.e. additional applications of oxidant result in little to no further decreases in dissolved VOC concentrations and production of oxidation by-products). This shall be defined as the time at which the following conditions can be documented: (1) ISCO has been conducted with resultant reductions in dissolved contaminant concentrations; (2) asymptotic conditions have been reached (only slight further reductions in dissolved concentrations are being achieved through continued treatment); and (3) VOC concentrations do not significantly increase when treatment is stopped (no meaningful rebound is occurring). Performance monitoring will be used to document the progress of the remediation, plume stability, and the attainment of these conditions. Process monitoring will ensure the appropriate application of the technology.

The performance of the ISCO remediation will be assessed by first monitoring and establishing baseline conditions in each source area to be treated and estimating the existing contaminant mass. Key parameters will then be monitored through time, both during oxidant injection and following injection, to monitor remediation progress. Such parameters include, but are not limited to, dissolved contaminant concentrations, quantity of oxidant injected, subsurface oxidant distribution, dissolved oxygen concentrations, and by-product concentrations.

Groundwater sampling within and downgradient of the treatment zone will enable measurement of the contaminant, oxidant, and dissolved oxygen concentrations. Monitoring during injection will determine the extent of oxidant influence in the treatment areas. Monitoring between injection events will show if any localized rebound in groundwater concentrations is occurring, enabling injection dosages and locations to be adjusted during subsequent injection events. When dissolved contaminant concentrations decrease and stabilize below baseline levels, it signals a mass removal. A lack of rebound indicated by long-term decreases in concentrations and a decreasing extent of persistent concentrations can indicate that ISCO has been effective.

The exact performance monitoring program will be developed during remedial design. Monitoring well construction and sampling and analytical plan details will depend on the oxidant type and the injection approach that is selected, and will be determined by EPA during remedial design. It is anticipated that some SVE wells inside each treatment area will be screened in the water table zone to serve as groundwater monitoring wells during and after ISCO injection events.

Following the indication of successful mass removal to the extent practicable by dissolved contaminant concentration measurements, soil cores could be used to confirm mass removal. However, if collection and analysis of soil cores is not viable due to interference by structures or building occupant activities, and only dissolved contaminant concentrations will be used to evaluate performance, then the duration of the ISCO operation may need to be extended in order to provide more assurance of treatment effectiveness. The slow process of contaminant dissolution and migration to monitoring points implies that the timeframe for determining effectiveness using only dissolved contaminant concentration measurements may be lengthy.

The basis for the cleanup goal was established in the Groundwater ROD (EPA, 1999b). The Groundwater ROD established that the principal threat is the NAPL because it continually dissolves into the groundwater, creating a distribution of dissolved phase contamination at concentrations in excess of health-based standards. Because of these factors, EPA considered the groundwater to be actionable. Whereas the Groundwater ROD issued a waiver of the ARARs relating to groundwater restoration based on technical impracticability, the waiver determined solely that existing technologies would be incapable of practicably recovering enough NAPL to attain standards at all points in the groundwater. Hence, a waiver of the standards was issued for the portion of the groundwater surrounding the NAPL. Technologies exist that would be capable of recovering some of the NAPL, and the TI waiver guidance directs EPA to demonstrate "that contamination sources [NAPL] have been identified and have been, or will be, removed and contained to the extent practicable." (Guidance for Evaluating the Technical Impracticability of Groundwater Restoration, U.S. EPA OSWER Directive 9234.2-25, October 1993; EPA 1993b). This Soil and NAPL ROD is therefore making the determination of the practicability and extent to which NAPL removal will occur in SA-3, SA-11 and SA-12.

The result after the NAPL remediation in Source Areas SA-3, SA-11, and SA-12 should be that NAPL has been sufficiently reduced to protect groundwater. The Groundwater ROD includes but does not solely rely upon monitored natural attenuation as a portion of the Del Amo Site OU-3 remedy. When NAPL is recovered from the ground, its mass and saturation are reduced, resulting in: (1) a reduction of the amount of time that the containment zone must be maintained, (2) a reduction of the potential for NAPL migration, and (3) an increased certainty that the groundwater remedial action will remain effective in the long-term.

## 8. Additional Areas of Contamination Encountered during Redevelopment or Construction

The clean-up goal for additional areas of Site-related contamination is to ensure that soil left in-place will not result in an unacceptable risk to construction workers or to the future commercial/industrial users of the property. For cases where the selected remedy removes contaminant mass (excavation, SVE), the RSL or CHHSL values for the commercial use scenario will be utilized as the cleanup goals. Evaluation of achievement of the cleanup goals will be based upon collection of soil or soil gas data.

For remedial methods that are focused on preventing direct contact, ingestion, or inhalation of impacted soil or soil vapor rather than mass removal (includes capping and BECs), the cleanup goal is to prevent unacceptable exposures to target contaminants, as described in the subsections regarding Capping and Building Engineering Controls, earlier in Section 12.4.2. The RSL/CHHSL will serve as the basis for determining the area over which these remedies will be applied, as described earlier in the section, in the discussions regarding capping and BECs.

### 12.4.3 Socio-Economic and Community Revitalization Impacts

While commercial/industrial use of the site has continued throughout the RI/FS process and is expected to continue into the future with little or no interruption, the presence of contamination and the associated uncertainty about potential health risks and future regulatory actions may be hindering sales and leases of properties at the site. Implementation of the remedial actions and institutional controls specified in this ROD to address the contaminated areas will benefit the business community by providing more certainty regarding the site environmental conditions.

### 12.4.4 Environmental and Ecological Benefits

No significant ecological benefits from the prescribed soil and NAPL remedy are anticipated. The following environmental benefits are anticipated:

- A reduction in potential health risks to land users;
- A reduction in the NAPL mass at source areas SA3, SA6, SA11 and SA12;
- Associated reductions in dissolved contaminant concentrations in the vicinity of the treated NAPL areas;
- A reduction in the time that the NAPL containment zone must be maintained;
- A reduction in the potential for NAPL to migrate laterally or vertically;
- An increase in the long-term effectiveness and certainty of the previously selected groundwater remedy.

### 12.4.5 Remedy Differences from the Proposed Plan

The BEC component of the remedy has one difference from its description in the Proposed Plan. The selected remedy in this ROD gives examples of the types of BECs which may be applied, including floor sealing and passive vapor barriers (among other things). Floor sealing and passive vapor barriers were not mentioned in the Proposed Plan. However, floor sealing was mentioned in the FS in the initial description of the BEC technology, although it was not part of the description of BECs in the “retained technologies” section of the FS. Regardless, both passive vapor barriers and floor sealing are common technologies used to address vapor intrusion and could be implemented at Del Amo as part of the BECs



component of the remedy. Therefore they were included in the description of BECs as examples of types of BECs.

### **12.5 Applicable or Relevant and Appropriate Requirements (ARARs)**

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as “ARARs,” unless such ARARs are waived under CERCLA section 121(d)(4). “Applicable” requirements are those cleanup standards, standards of control and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. “Relevant and appropriate” requirements are those cleanup Standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

The complete list of ARARs for this ROD is in Table 12-17. The selected remedy will meet all ARARs. Many of the ARARs will only be applicable or relevant and appropriate if a particular technology is selected for the SVE treatment technology. Some ARARs will relate to all of the possible technologies under consideration, while others need only be met if internal combustion or thermal oxidation is chosen by EPA during remedial design as a treatment technology. EPA may choose different treatment technologies for different SVE systems, and the use of each technology must meet the relevant ARARs. Most of these ARARs relating to the SVE treatment technologies require air emissions from the systems to meet specific requirements. In addition, several ARARs will only be triggered for excavation remedies for areas of site-related contamination that may be encountered in the future. Finally, State regulations governing land use covenants must be complied with for all properties that are not suitable for unrestricted use.

DTSC and SWRCB have identified provisions of the Regional Water Quality Control Board (Los Angeles Region) Waste Discharge Requirements (WDRs), Order No. R4-2007-0019 as potential ARARs related to the NAPL treatment remedial actions selected in this ROD. EPA does not expect that the NAPL treatment actions will have any impact on water quality outside of the TI Waiver Zone and therefore has not identified the substantive provisions of these WDRs as ARARs in this ROD. If later information indicates to EPA that the NAPL treatment actions selected in this ROD will impact ground water quality outside the TI Waiver Zone or will impact surface water, EPA will re-evaluate its decision and, if determined necessary by EPA, amend this ROD through an Explanation of Significant Differences (ESD) or ROD Amendment to identify relevant and appropriate substantive provisions of these WDRs as ARARs for the NAPL treatment actions selected in this ROD.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-17: Chemical-Specific ARARS**

Requirement	Prerequisite	Citation	ARAR Determination	Comments
<b>SOIL</b>				
<b>Resource Conservation and Recovery Act (RCRA)/HWCA*</b>				
Characterization of RCRA hazardous waste.	Waste soil	Title 22 CCR Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 [40 C.F.R. sections 261.20 – 24]	Relevant and appropriate	Any site-related contamination encountered in the future during construction or development activities shall be characterized.
Characterization of Non-RCRA hazardous waste.	Waste soil	Title 22 CCR section 66261.101(a) – (d)	Relevant and appropriate	Any site-related contamination encountered in the future during construction or development activities shall be characterized.
Air Emission Standards for Process Vents	Process vents associated with RCRA hazardous wastes with organic concentrations or at least 10 ppmw	40 C.F.R. §§ 264.1030, 264.1032 – 1034; see also 22 CCR §§ 66264.1030, 66264.1032 – 1034	Relevant and appropriate	Treatment for SVE must meet air emissions standards.
Control of stormwater runoff	Remedial action sites that are greater than one acre in size.	SWRCB Order 2009-0009-DWQ §§ III, V, VI, IX, X, XI, XII, XIII and XIV	Relevant and appropriate	If current or future remedial actions include construction covering at least one acre, such actions must comply with the relevant and appropriate substantive provisions of the cited sections of SWRCB Order No. 2009-0009-DWQ.
Requirements for incinerators	Incineration	40 C.F.R. §§ 264.340 – 343, 264.345 (substantive portions), 264.347, and 264.351. See also 22 CCR §§ 66264.340-343, 66264.345 (substantive portions), 66264.347, and 66264.351.	Applicable	If the treatment for SVE chosen by EPA during remedial design is thermal oxidation, then the requirements for incinerators are applicable.
Miscellaneous Units	Miscellaneous unit defined under 40 C.F.R. 260.10	40 C.F.R. 264.600-603	Applicable	If the treatment for SVE chosen by EPA during remedial design is internal combustion, condensation, or carbon adsorption, then the requirements for miscellaneous units are applicable.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-17: Chemical-Specific ARARS**

Requirement	Prerequisite	Citation	ARAR Determination	Comments
Thermal treatment requirements	Thermal treatment of hazardous waste	40 C.F.R. §§ 265.370, 373, 375, 377, 381, and 382. See also 22 CCR §§ 66265.370, 373, 375, 377, 381, and 382.	Relevant and appropriate	These operating, monitoring, and closure requirements are relevant and appropriate for thermal oxidation or internal combustion technologies used for SVE treatment.
<b>AIR</b>				
National Emission Standards for Hazardous Air Pollutants (NESHAPs)	Process equipment that treats liquids or vapors containing >10% weight hazardous air "HAPs") and is a potential source of air emissions of HAPs.	40 CFR 61.01(a)(c)(d), Subpart J, sections 61.110 and 61.112; see also SCAQMD Regulation X, Subpart J	Relevant and Appropriate	Fugitive benzene emissions from SVE treatment technologies must be controlled.
South Coast Air Quality Management District	Discharge to air containing toxics	Regulation XIV, Rule 1401	Relevant and appropriate	Rule 1401 specifies limits on maximum incremental cancer risk (MICR) and hazard index (HI) from new sources. SVE treatment technologies must meet emissions limitations for benzene.

**Acronyms:**

ARARs - Applicable or relevant and appropriate requirements  
CCR - California Code of Regulations  
CFR - Code of Federal Regulations  
EPA - U.S. Environmental Protection Agency  
HAPs – Hazardous Air Pollutants  
HWCA - Hazardous Waste Control Act.  
MICR – Maximum Incremental Cancer Risk  
NESHAP – National Emission Standards for Hazardous Air Pollutants  
ppmw - Parts per million by weight  
RCRA - Resource Conservation and Recovery Act  
SVE – Soil Vapor Extraction  
SWRCB – State Water Resources Control Board

**TABLE 12-18: Location-Specific ARARS**

Location	Requirement	Prerequisites	Citation	ARAR Determination	Comments
<b>Hazardous Waste Control Act (HWCA)</b>					
Within 100-year floodplain	Facility must be designed, constructed, operated, and maintained to avoid washout.	RCRA hazardous waste; treatment, storage, or disposal of hazardous waste.	40 C.F.R. § 264.18(b); see also 22 CCR 66264.18(b)	Relevant and appropriate	Del Amo site is in the floodplain of the Los Angeles River

**Acronyms:**

ARAR - Applicable or relevant and appropriate requirement.

CCR - California Code of Regulations.

CFR - Code of Federal Regulations.

HWCA - Hazardous Waste Control Act.

RCRA - Resource Conservation and Recovery Act.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-19: Action-Specific ARARS**

Action	Requirement	Prerequisites	Citation	ARAR Determination	Comments
Onsite waste generation	Person who generates waste shall determine if that waste is a hazardous waste.	Generation of hazardous waste	40 C.F.R. 262.11; see also 22 CCR 66262.11	Applicable	
Hazardous waste accumulation	Conditions for accumulation of waste on-site for 90 days or less.	Accumulate hazardous waste.	40 C.F.R. 262.34; see also 22 CCR Section 66262.34	Applicable	Accumulation of hazardous wastes onsite for longer than 90 days would be subject to RCRA requirements for storage facilities.
Landfills, Capping of wastes in place	Capping of hazardous wastes in place to prevent migration to groundwater. <ul style="list-style-type: none"> <li>Minimize migration of liquids through cap</li> <li>Promote drainage and minimize erosion</li> </ul>	RCRA hazardous waste that is capped in place at the site as part of the long term permanent remedy. Prevent run on and run off from damaging cap	40 CFR 264.310; 22 CCR 66264.310 40 CFR 264.228; 22 CCR 66264.228	Relevant and appropriate	
Requirements for land use covenants	Land use covenants with appropriate restrictions must be executed and recorded.	Hazardous substances remaining at the property such that it is not suitable for unrestricted use	22 CCR 67391.1(a) and (d)	Relevant and appropriate	Land use covenants with appropriate land/water use restrictions will be implemented for all areas where land and/or groundwater are not suitable for unrestricted use.
Discharge to air	Limits visible emissions from any point source	Visible emission to atmosphere.	SCAQMD Regulation IV, Rule 401	Relevant and appropriate	
	Requires prevention, reduction, or mitigation of fugitive dust.	Activity capable of generating fugitive dust.	SCAQMD Regulation IV, Rule 403	Relevant and appropriate	
	Limits particulate emissions.	Discharge of particulate matter into the atmosphere.	SCAQMD Regulation IV, Rule 404	Relevant and appropriate	
	Limits particulate emissions from a combustion source to 0.1 grain per standard cubic foot at 12%	Combustion exhausts	SCAQMD Regulation IV, Rule 409	Relevant and appropriate	Applicable to thermal oxidation or internal combustion technologies for SVE treatment.

## PART II DECISION SUMMARY

## SECTION 12.0: SELECTED REMEDY

**TABLE 12-19: Action-Specific ARARS**

Action	Requirement	Prerequisites	Citation	ARAR Determination	Comments
	CO <sup>2</sup> averaged over 15 minutes				
	Standard of Performance for Stationary Spark Ignition Internal Combustion Engines	New sources	SCAQMD Regulation IX, Subpart JJJJ	Relevant and appropriate	Relevant and appropriate if EPA chooses internal combustion technology for SVE treatment during remedial design.
	Limits VOC emissions from soil excavations	Excavation, grading, handling or treating of VOC-contaminated soils	SCAQMD Regulation XI, Rule 1166	Relevant and appropriate	If site-related contamination is encountered in the future, this ARAR applies to the excavation remedy.
	New Source Review	New emissions source or modification of existing source	SCAQMD Regulation XIII, Rule 1303(a)	Relevant and appropriate	If emissions from SVE treatment technologies would exceed thresholds, Best Available Control Technology would be required to limit emissions.

**Acronyms:**

ARARs - Applicable or relevant and appropriate requirements

CCR - California Code of Regulations

CFR - Code of Federal Regulations

CO<sup>2</sup> – Carbon dioxide

RCRA - Resource Conservation and Recovery Act

SCAQMD – South Coast Air Quality Management District

SVE – Soil Vapor Extraction

VOC – Volatile Organic Compound



## 13.0 Statutory Determinations

### 13.1 Protection of Human Health and Environment

The selected remedy utilizes treatment, engineering controls, and institutional controls to protect human health and the environment from the potential risks posed by the Site. The Site poses a potential risk to current occupants and potential future users of the contaminated properties through the direct contact, ingestion, and inhalation of contaminants from the outdoor shallow soils, and the inhalation of contaminants from the shallow soil beneath two buildings. The Site poses a risk to the groundwater through the principal threat wastes in the deep soil continuing to dissolve into the groundwater. Finally, the Site poses a potential risk to receptors if contaminated groundwater is extracted and utilized for domestic purposes.

The potential risks from the outdoor shallow soils contaminated above acceptable levels are addressed by capping, soil vapor extraction (SVE), and institutional controls (ICs). Capping is an engineering control that physically prevents occupants from contacting, inhaling, or ingesting the contaminants. In the locations capping is to be applied, the caps will extend to where the contamination decreases to a 1E-6 cancer risk level and hazard index of 1.0 for a commercial exposure scenario. SVE is a treatment mechanism that physically removes volatile contaminants from the soil. SVE was selected for application in locations where the potential risk to commercial users exceeds 1E-6 cancer risk and/or a hazard index of 1.0. Four layers of ICs will work together to prevent exposure to the contaminated soil that is left in place, prevent interference with the constructed components of the remedy, and prohibit future land uses that could result in unacceptable exposure to contaminants. The ICs accomplish this by: (a) alerting parties to the presence of contamination or potential for encountering contamination prior to any excavation of soil and requiring review of excavation plans by EPA; (b) informing land-use planners and the public about the Superfund site through a footnote in the City's General Plan; (c) prohibiting property owners from interfering with the physical components of the remedy, and requiring EPA approval prior to excavation on their properties, and prohibiting residential use of their properties. These approaches will be utilized for currently identified areas of shallow soil contamination requiring remediation.

For any areas of shallow soil encountered in the future with site-related contamination exceeding acceptable risk-based levels, the remedy will address them with excavation, SVE, capping and ICs. Excavation physically removes the contaminants from the soil. Excavation would be applied to soils where concentrations of site-related contaminants exceed the Regional Screening Level and background levels. The manner in which SVE, capping and ICs address potential risks is described above.

The potential risks from the shallow soil beneath buildings that is contaminated above acceptable levels are addressed by Building Engineering Controls (BECs), SVE, and ICs. BECs are engineering controls that reduce the concentrations of site-related contaminants in the indoor air to acceptable levels. The BECs will be applied in a manner that reduces the concentrations of site-related chemicals in the indoor air, originating from below the slab, to below background or a 1E-6 cancer risk and 1.0 hazard index for a commercial exposure scenario, whichever is higher. SVE (described above) will accomplish the same risk reduction as described for the SVE system above. The IC layers mentioned above will prevent inadvertent exposure to the contaminated soil left in place beneath the building, prevent interference with the constructed components of the remedy, and prevent future land use that could result in unacceptable exposure to contaminants. The ICs accomplish these objectives as described above.

The risk to the groundwater from the principal threat wastes in the deep soil will be addressed by in-situ chemical oxidation (ISCO) and SVE. ISCO is a treatment mechanism that chemically breaks down the



contaminants into harmless by-products. Treatment with ISCO and SVE will reduce the principal threat wastes to the extent practicable given the limitations of the technologies, which will increase the long-term effectiveness of the Dual-Site Groundwater Operable Unit remedy. These treatments in the deep soil are being designed to accomplish a maximum mass reduction practicable, rather than particular degree of risk reduction.

Risk from the contaminated groundwater will be addressed by the restrictive covenant IC layer. This IC layer will prohibit groundwater extraction wells from being installed or utilized on the properties.

The implementation of this remedy will not pose unacceptable short-term risks or cross-media impacts.

**13.2 Compliance with Applicable or Relevant and Appropriate Requirements**

The ARARs are described in Section 12.5 and Table 12-17. The selected remedy will meet all ARARs.

**13.3 Cost-Effectiveness**

The selected remedy, Alternative 4, is cost-effective because its costs are proportional to its overall effectiveness. Its overall effectiveness was determined by examining its balance of long-term effectiveness and permanence; reduction in toxicity, mobility, and volume; and short-term effectiveness. The cost effectiveness evaluation is summarized in Table 13-1 and discussed below.

**TABLE 13-1: Cost Effectiveness Summary**

Alternative	Present Worth Cost	Incremental Cost	Long-Term Effectiveness and Permanence	Reduction of TMV through Treatment	Short-Term Effectiveness
1	0	-	None.	None.	None.
2 ICs (permit review, information)	\$3,890,000	+\$3,890,000	OUTDOOR SHALLOW SOIL Possible but uncertain	No reduction	No impacts
			BENEATH BUILDING Not effective	No reduction	No impacts
			NAPL/GW SOURCE AREA Prevents exposure No removal of PTW	No reduction	No impacts
3 ICs (above and General Plan footnote, covenants), cap, BEC, HE/SVE	\$49,380,000	+\$45,490,000	OUTDOOR SHALLOW SOIL Physical barrier	No reduction	No or minor impacts
			BENEATH BUILDING Prevents exposure	No reduction	Range from little impact to greater
			NAPL/GW SOURCE AREA Some removal of PTW	Some reduction of volume	Potential releases
4 ICs (same as 3), cap, SVE (SS), BEC and SVE(UB), ISCO/SVE	\$50,430,000	+\$1,049,990	OUTDOOR SHALLOW SOIL Removes some contaminants Physical barrier	Some reduction of volume	Moderate construction impacts Potential VOC releases
			BENEATH BUILDING Prevents exposure Removes some contaminants	Some reduction of volume	Range from little impact to greater

**TABLE 13-1: Cost Effectiveness Summary**

Alternative	Present Worth Cost	Incremental Cost	Long-Term Effectiveness and Permanence	Reduction of TMV through Treatment	Short-Term Effectiveness
			NAPL/GW SOURCE AREA More removal of PTW	More reduction of volume	Potential releases
5 ICs (same as 3), excavation, SVE(UB), ISSH/SVE	\$81,670,000	+\$31,240,000	OUTDOOR SHALLOW SOIL Removes all contaminants	Complete reduction of volume	Most construction impacts Potential dust & VOC releases
			BENEATH BUILDING Removes all contaminants	Complete reduction of volume	Moderate construction impacts Potential VOC releases
			NAPL/GW SOURCE AREA Most removal of PTW	Most reduction of volume	Greatest potential releases

## Notes:

ICs – Institutional Controls  
 BEC – Building Engineering Controls  
 HE – Hydraulic Extraction  
 SVE – Soil Vapor Extraction  
 SS – Shallow Soil  
 UB – Under Building  
 ISCO – In-Situ Chemical Oxidation  
 ISSH – In-Situ Soil Heating  
 VOC – Volatile Organic Compound

Alternatives 1 (No Action) and 2 (ICs – 2 layers) are not cost effective because they do not accomplish protection of potential receptors and protection of the groundwater remedy. Alternatives 3, 4 and 5 are all cost effective since they accomplish the necessary protections. Alternative 5 (ICs 4 layers, excavation, SVE(UB), in-situ soil heating and SVE) accomplishes the most reduction of toxicity, mobility and volume (TMV), but for the highest cost and the greatest potential for short-term impacts. Alternatives 3 and 4 cost significantly less than 5, and Alternative 4 (ICs 4 layers, cap, SVE(SS), building engineering controls, SVE(UB), in-situ chemical oxidation and SVE) accomplishes more waste reduction than Alternative 3 for only slightly more cost.

#### 13.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable (MEP)

The selected remedy provides the best balance of trade-offs among the alternatives with respect to the balancing criteria such that it represents the maximum extent to which permanence and treatment can be practicably utilized at this site. The balancing criteria summary in the previous section shows that Alternatives 3, 4 and 5 all utilize treatment to varying degrees, with 3 using the least and 5 the most. The costs of each alternative align in that order as well. However, the potential short-term impacts favor Alternative 4. Thus, in selecting Alternative 4, the trade-off is less reduction of Toxicity, Mobility and Volume but less potential short-term impacts and for a lower cost. This balancing emphasizes the “long-term effectiveness” factor and the “reduction of toxicity, mobility or volume through treatment” factors, but tempers them with consideration for short-term impacts and cost. The selection also accounts for

the preference for treatment and bias against off-site disposal. Off-site disposal was a significant component of Alternative 5, which was another factor that led to the selection of Alternative 4 (except additional areas encountered in the future).

The other criteria that impacted the balancing and selection was implementability, particularly the implementability of Alternative 5's in-situ soil heating (ISSH) element. One of the significant implementability issues for all of the three alternatives being discussed in this section is implementing the NAPL treatment technologies on properties that have active business operations occurring. All three alternatives face this issue, but it is greatest for ISSH because of the robust control of subsurface vapors that would need to be established and the amount of infrastructure that would need to be installed. The infrastructure issue also impacts Alternative 3, both more so than Alternative 4. Evaluation of the implementability criteria therefore favored Alternative 4.

### **13.5 Preference for Treatment as a Principal Element**

The Selected Remedy, Alternative 4, satisfies the statutory preference for treatment by utilizing two treatment technologies, SVE and ISCO, along with several containment and exposure prevention approaches (capping and BEC). The source materials constituting the principal threats consist of contamination in non-aqueous phase liquid (NAPL) form, located in four "source areas" where treatment with SVE and ISCO will occur. In addition to the NAPL sources, SVE treatment will also be utilized in three areas where shallow soil is contaminated with VOCs present but not in NAPL form. The NAPL source areas are described in Section 11.0.

### **13.6 Five-Year Review Requirements**

A five-year review will be required pursuant to CERCLA §121(c) and the NCP §§300.430(f)(5)(iii)(B) and 300.430(f)(3)(ii)(A) because waste will be left in place in excess of levels that would allow for unrestricted use of the land and groundwater.

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PART III: RESPONSE SUMMARY

## **PART III      RESPONSIVENESS SUMMARY**



## PART III: RESPONSE SUMMARY

## Summary of Public Comments Del Amo Superfund Site Proposed Plan

Comment #	Comment	Category	Source
1	Has there been ongoing monitoring of vapor intrusion in the buildings on the site?	Vapor Intrusion	1
2	What is the history of vapor intrusion monitoring in the adjacent residential areas?	Vapor Intrusion	1
3	In the afternoon the wind blows gray dust into the house. Does the dust contain DDT?	Airborne Dust	2
4	Specify how the extracted vapors will be treated under preferred alternative No. 4. We want to make sure dioxins or other chemicals are not created from a combustion technology	Treatment of Extracted Vapors	3
5	You should expand the treatment area for chemical oxidation to treat as much of the source contamination as possible	Source Removal	3
6	There should be an ongoing vapor intrusion monitoring plan	Vapor Intrusion	3
7	How old are the vapor intrusion studies that have been done, if any, and would you please send a copy of them to the Del Amo Action Committee office	Vapor Intrusion	3
8	How old is the risk assessment? If old, what has been done to incorporate new science? How have cumulative impacts been addressed?	Health/Risk Assessment	3
9	What is the difference between the federal and the state screening numbers?	Cleanup Goals	3
10	What has been done to investigate the health of the workers who redeveloped the site?	Health/Risk Assessment	3
11	Why has a technical impracticability waiver been established and where is the TI waiver zone?	TI Waiver Zone	3
12	How will you address the uncertainties around implementing General Plan footnote and restrictive covenant institutional controls?	Institutional Controls	3
13	Is the LNAPL smear zone at 25 feet getting bigger or smaller? What does this mean in terms of continued contamination?	LNAPL	3
14	What will happen to soil that is excavated. We do not want soil to go to Kettleman City	Waste Soil Disposal	3
15	More community outreach and education is needed, based on the low turnout to this public meeting.	Community Relations	3



## PART III: RESPONSE SUMMARY

Comment #	Comment	Category	Source
16	Please consider using the Los Angeles Department of Water and Power (LADWP) lot to house the excavation system, as well as covering the system or hiding the system with shrubs. Commenter is concerned with alarming the tenants and with maintaining all of the parking space.	Short Term Effectiveness	4
17	Please consider running piping for the planned vapor extraction system along the sidewalk or Hamilton Avenue rather than through the parking lot of 20101 Hamilton Avenue. Excavation would cause disruption in the parking lot and require offsite parking for tenants.	Short Term Effectiveness	5
18	During chemical injections please keep the affected area to a minimum and shield it from view.	Short Term Effectiveness	5
19	Please consider not installing vapor extraction treatment systems on the parking lot directly behind our buildings at 20280 and 20300 South Vermont Avenue. The best location would be in the LADWP easement.	Short Term Effectiveness	6
20	Make sure the treatment system equipment is well-screened by landscaping or fencing so as not to be unsightly or alarm potential tenants.	Short Term Effectiveness	6
21	The PCIG property, located at 1000 West 190th Street, should not be subject to institutional controls. PCIG has investigated and removed contamination to residential cleanup standards in consultation with EPA. The Site Closure Report was submitted to EPA and EPA sent PCIG a letter on February 13, 2002 stating "based on environmental data that you made available to us and the soil removal actions you under took on your property, EPA does not at this time anticipate the need for further investigation or remediation on your property."	Institutional Controls	7
22	CC&Rs for the Pacific Gateway Center already restrict use to commercial or industrial, so deed restrictions are not necessary	Institutional Controls	7
23	Who would bear responsibility for the costs of any further site investigations or for any reductions in property values caused by EPA's proposed actions? Any remedy that is selected should clarify that the Del Amo responsible parties, rather than the current property owners, should bear any costs related to the remedy.	Institutional Controls	7
24	Based on discussions with EPA, EPA will set up procedures by which the Building Department will red-flag properties so that EPA is notified in the event of redevelopment. EPA would determine the required investigation work and EPA's contractor would perform any necessary remediation. It is critical that there be established procedures and timelines for this process to avoid unreasonable and potentially costly delays.	Institutional Controls	7

## PART III: RESPONSE SUMMARY

Comment #	Comment	Category	Source
25	PCIG is concerned that in the future EPA may no longer be involved, or EPA personnel will not be familiar with the Del Amo site. If so, property owners with restricted properties may have no way to re-develop the property or lift the restrictions. Provide assurances that this will not occur.	Institutional Controls	7
26	The Respondents continue to believe that Intrinsic Biodegradation, ICs, and Monitoring are an appropriate remedy for the site as a whole, with the exception of NAPL source area 3 (SA 3), where the addition of SVE is appropriate. This is based on a "weighted average rating" evaluation of remedial alternatives for each property and consideration of recent Federal and State policies and guidance regarding sustainability. No complete exposure pathways currently exist at the site and implementation of Intrinsic Biodegradation, ICs, and Monitoring would be protective of human health and the environment while minimizing adverse effects to onsite businesses.	Remedy Selection	8
27	There continues to be strong evidence that intrinsic biodegradation of VOCs is actively occurring at the site, as evidenced by trends of declining VOC concentrations in many groundwater monitoring wells. Consequently, additional confirmatory sampling will be performed during the design phase wherever an active remedy is selected by EPA. The objectives of confirmatory sampling will be to verify that contaminant concentrations warranting application of the active remedy are still present in the soil and to further define the horizontal and vertical extent of the treatment zones.	Remedy Selection	8
28	<b>Page 8, What are Building Engineering Controls(BEC)?:</b> We suggest that the definition of BECs that USEPA presents in the ROD be expanded by modifying the definition text in the Proposed Plan to: "BECs are control measures applied at buildings so that contaminated vapors do not build up inside the building and cause health concerns. Examples of the types of BECs that may be applied include, but are not limited to:"	Building Engineering Controls	8

## PART III: RESPONSE SUMMARY

Comment #	Comment	Category	Source
29	<p><b>Page 8, What are Building Engineering Controls(BEC)?:</b> The types of BECs currently mentioned and described in the Proposed Plan are subslab venting, building depressurization, and normal ventilation. We suggest that in the ROD the following two types of BECs be included in the explanation:</p> <p>Passive Vapor Barriers Barriers made of plastic sheeting or cured-in-place materials are placed under the building slab to prevent vapor intrusion into the building.</p> <p>Floor Sealing Floor sealants and sealing filters are applied to existing floor slabs to reduce vapor diffusion through the slab and to seal cracks, gaps, and openings in the floor.</p>	Building Engineering Controls	8
30	<p><b>Page 9, what is In-Situ Chemical Oxidation?:</b> The second and third sentences don't accurately describe the ISCO process. We would suggest modifying these sentences in the ROD as follows: "Oxidant is pumped into the saturated zone through the wells. The contaminant is oxidized in place, and an SVE system is utilized to remove the vapors created through the oxidation process along with other vadose zone vapors. In addition, residual oxygen from the process promotes natural attenuation."</p>	ISCO	8
31	<p><b>Page 12, Alternative 4, Cost estimates:</b> The "Estimated Construction Time Frame" is listed as 3 to 4 years of operation. However, this is inconsistent with the capital and O&amp;M costs presented in the FS. For Alternative 4 (ISCO+SVE), the timeframe and other implementation details will be determined during remedial design. In the FS, ISCO components of 2-year, 4-year and 8-year timeframes were discussed. The Respondents suggest inclusion of the 2-year ISCO option as well in the ROD, because pilot testing could show this to be appropriate and property owners may deem remedy impacts to be lower.</p>	Costs	8
32	<p><b>Page 19, Table 6:</b> The information in Table 6 indicates that USEPA's Preferred Alternative includes SVE for properties where VOC-contaminated outdoor shallow soil is present, including properties 6, 11 and 23. While NAPL source areas with proposed ISCO and SVE remedies are present in the vicinity of the each of these areas, stand-alone SVE systems (e.g., wells, blowers, and treatment systems), that would not otherwise be installed, would be required to address VOCs in the shallow soil. It is the Respondents' position that Capping, ICs and Monitoring at these areas would be protective of human health while being more cost effective and less intrusive than SVE. Additional SVE in these areas would result in significant increases in complexity, cost, and intrusion on the property owners without commensurate risk reduction.</p>	Remedy Selection	8

## PART III: RESPONSE SUMMARY

Comment #	Comment	Category	Source
	<p>Risks associated with each of these three properties are within USEPA's discretionary risk range (<math>1 \times 10^{-4}</math> to <math>1 \times 10^{-6}</math>) and are summarized below:</p> <p>Property 6 (Commercial Worker):  Outdoor Soil: <math>3 \times 10^{-6}</math> (Cancer Risk) &lt;1 (Hazard Index)  Indoor Air: <math>4 \times 10^{-6}</math> (Cancer Risk) &lt;1 (Hazard Index)</p> <p>Property 11 (Commercial Worker):  Outdoor Soil: <math>2 \times 10^{-5}</math> (Cancer Risk) &lt;1 (Hazard Index)  Indoor Air: <math>7 \times 10^{-6}</math> (Cancer Risk) &lt;1 (Hazard Index)</p> <p>Property 23 (Commercial Worker):  Outdoor Soil: <math>1 \times 10^{-5}</math> (Cancer Risk) &lt;1 (Hazard Index)  Indoor Air: <math>2 \times 10^{-5}</math> (Cancer Risk) &lt;1 (Hazard Index)</p>		
33	<p><b>Page 19, Table 6, and page 20, text in first paragraph under Shallow Soil Components – Outdoor and Beneath Buildings:</b> Though it is not specified in the Proposed Plan, the Respondents infer that USEPA's Preferred Alternative includes Building Engineering Controls (BECs) at property 16, and SVE beneath the building at property 23. Further, the Respondents understand that USEPA's decision to include these remedial responses in the Preferred Alternative at these two properties is based on concerns associated with chlorinated solvents in shallow soil, specifically TCE and PCE, beneath these buildings. The extensive site history investigation of the former rubber plant that was performed during the Remedial Investigation revealed no evidence that TCE and PCE were ever used at the site during the operational life of the rubber plant complex. Because there is no evidence that these compounds were used at the former rubber plant that was the subject of the RI/FS investigation, the Respondents maintain that they should not be responsible for designing, constructing and operating these components of USEPA's Preferred Alternative.</p>	Remedy Selection	8
34	<p><b>Page 19 Table 6, and page 20 text in second paragraph under NAPL/Groundwater Contamination Source Areas Components:</b> Active remedial measures proposed for NAPL SA6 are limited to SVE in the vadose zone. Previous ROST and soil boring analytical data, as well as recent UVOST work in this area suggest the majority of the vadose zone contaminant mass is in the shallow subsurface (i.e., less than 15 feet below ground surface) and a complete exposure pathway is not present. Confirmatory sampling with chemical analysis should be performed in this area during the remedial design phase to assess whether elevated VOC concentrations are present in these shallow soils that would warrant a remedial response. If the results of the</p>	Remedy Selection	8

## PART III: RESPONSE SUMMARY

Comment #	Comment	Category	Source
	additional assessment confirm that elevated VOC concentrations in the vadose zone are present, but are limited primarily to the shallow subsurface (<15 feet below ground surface), then the Respondents believe that any vadose zone SVE system should be designed to target only this shallow zone. However, if the results of the additional assessment show that contaminant concentrations have declined below levels that warrant an active remedial response, then an alternative remedial measure (such as Capping with ICs and Monitoring) should be considered for implementation.		
35	<b>Page 19 Table 6:</b> Properties numbered 29 and 34 are listed in the table, apparently in error, with Institutional Control layers 1 through 5 being applied as part of USEPA's preferred alternative. As indicated on Figures 3 and 4 and elsewhere in the Proposed Plan, the Respondents understand that EPA has decided to defer remedial decisions for both of these properties to the Montrose Superfund Project. Consequently, remedial decisions for properties 29 and 34 should not be included in USEPA's Record of Decision for the Del Amo Soil and NAPL Operable Unit.	Remedy Selection	8
36	<b>Throughout document:</b> Numbered areas are referred to in the Proposed Plan, sometimes referring to one or more properties (e.g. "Area 6"), but other times referring to one or more groundwater contamination source areas (e.g. "Source Area 6"). This different usage may confuse the reader. The Respondents therefore suggest that in the ROD, USEPA refer to "properties" or "property" as an alternative to "area" wherever the reference is to a numbered property rather than a NAPL source area, to more clearly distinguish them.	Readability	8

## Comment Sources:

- 1 Marlene Canas verbal comments during Proposed Plan public meeting
- 2 William Straight verbal comments during Proposed Plan public meeting
- 3 Cynthia Babich verbal comments during Proposed Plan public meeting
- 4 Tinamarie Conant, written comments submitted at Proposed Plan public meeting
- 5 Romy Miura, written comments submitted at Proposed Plan public meeting
- 6 Karen Fredericks, written comments submitted via email
- 7 Albert M. Cohen, written comments on behalf of PCIG
- 8 Shell Chemical, written comments

PART III: RESPONSE SUMMARY

VAPOR INTRUSION

COMMENT #1

Has there been ongoing monitoring of vapor intrusion in the buildings on the site?

RESPONSE

The potential for vapor intrusion in buildings within the OU-1 area (former plant property) was first evaluated in the Baseline Risk Assessment through vapor transport modeling using soil, soil vapor and groundwater data. Based on those results, additional vapor intrusion assessments through collection and analysis of subslab vapor samples were completed at five buildings deemed to be at risk. There has not been any other ongoing monitoring for vapor intrusion in the buildings within the OU-1 area besides these activities mentioned. Based on the results of these evaluations, USEPA's selected remedy includes Building Engineering Controls at one building (Area 16), and Soil Vapor Extraction beneath a second building (Area 23) to address the potential for vapor intrusion to be occurring at those two locations. Soil vapor monitoring activities and/or indoor air monitoring will be required at these two buildings as part of the remedial activities therein.

CATEGORY: Vapor Intrusion (see also comments #2, 6, 7)

SOURCE: 1

## PART III: RESPONSE SUMMARY

## VAPOR INTRUSION

COMMENT #2

What is the history of vapor intrusion monitoring in the adjacent residential areas?

RESPONSE

Soil vapor intrusion evaluations in the residential areas adjacent to the Del Amo Site included activities conducted on 204<sup>th</sup> Street. Soil vapor and indoor air sampling was conducted and the results were evaluated for residences on 204<sup>th</sup> Street in 1994 and 1995. Soil vapor monitoring associated with the Waste Pits Area remediation began in 2003 and is currently conducted monthly at perimeter wells located within the former 204<sup>th</sup> Street residential area.

A 1995 Health Consultation by the U.S. Agency for Toxic Substances and Disease Registry (ATSDR)<sup>9</sup> evaluated the 1994 data collected at the 25 residences on 204<sup>th</sup> Street. The consultation concluded that contaminants were either below the Los Angeles County indoor air reference levels and/or below ATSDR's health comparison levels. It also concluded that the sources of contaminants could not easily be ascertained because the majority of the levels were comparable to levels in properties not impacted by the Superfund sites.

The 2004 Public Health Assessment<sup>10</sup> modeled potential vapor migration and vapor intrusion into residences using groundwater contaminant concentration data. The assessment found that this potential exposure pathway would not exceed the risk threshold levels.

As part of the ongoing OU-2 (Waste Pits Area) remedial action, monthly soil vapor monitoring with field analyzers is conducted monthly at 5 perimeter wells and quarterly at 7 perimeter wells, 4 of which are located within the former 204<sup>th</sup> Street residential area. The purpose of this monitoring is to ensure that contaminants in soil vapor do not migrate beyond the limits of the Waste Pits treatment area. As concluded in the Waste Pits Second 5-Year Review (September 22, 2010), "The continued low concentrations of VOCs detected at the perimeter wells indicate good control of injected air volumes, that the cover system is performing as designed, and that the contaminated soil vapors are not migrating beyond the cap boundaries."

In addition, soil gas samples were collected in 2003 and 2006 for laboratory analysis of benzene and other VOCs from the 4 perimeter wells located in the former 204<sup>th</sup> Street residential area. The laboratory results for benzene and other VOCs in all of these samples are well below conservative Human Health Screening levels developed by the State of California for residential areas to address the potential migration of VOCs from contaminated soil or groundwater into indoor air.

Investigations within the former Del Amo plant property have generally shown that vapors emanating from the water table in areas with high dissolved concentrations attenuate relatively quickly and do not reach the ground surface at concentrations of concern. It is expected that there would be even less chance of significant shallow vapor concentrations in areas of lower groundwater contaminant

<sup>9</sup> "Health Consultation, Health Impacts of Contaminants in Soil, Air, and Tap Water, Montrose Chemical Corporation . . . and Del Amo Facility . . .," by U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (May 1995).

<sup>10</sup> "Public Health Assessment, Del Amo Superfund Site, Near Torrance, Los Angeles County, California," by California Department of Health Services (July 29, 2004).

PART III: RESPONSE SUMMARY

concentrations, including the residential area, where dissolved concentrations of VOCs in groundwater are much lower.

CATEGORY: Vapor Intrusion (see also comments #1, 6, 7)

SOURCE: 1



## PART III: RESPONSE SUMMARY

COMMENT #3

In the afternoon the wind blows gray dust into the house [adjacent to the 204<sup>th</sup> Street buy-out area]. Does the dust contain DDT?

RESPONSE

Based on the results obtained from the soil sampling and testing events described below, EPA does not have evidence suggesting that harmful concentrations of DDT are present in any dust originating from the 204<sup>th</sup> Street undeveloped property. (The referenced property was described by the commenter as being located on the south side of Berendo Avenue, adjacent to the undeveloped "buy-out" area).

Between 1995 and 1998 under the direction of EPA, DDT-impacted soil was excavated and removed from specific areas on 204<sup>th</sup> Street, within the currently undeveloped property extending from New Hampshire Avenue on the east, to Budlong Avenue on the west. Following completion of these removal actions, confirmatory soil samples were collected and submitted for analysis of pesticides, including DDT. Analytical laboratory results confirmed that no DDT concentrations exceeding the EPA action level remained. Additional soil sampling and testing was performed in this area in the years that followed this removal action as summarized below.

In 1998, additional soil samples were collected from soils exposed after residential building demolitions and foundation removals were completed within this area. Soil samples were submitted for analysis of pesticides, including DDT, and analytical laboratory results confirmed that no DDT concentrations were present exceeding the EPA action level. On June 15, 2000, EPA issued a letter to County of Los Angeles Department of Parks and Recreation stating that the levels of DDT were within acceptable risk levels and the area was suitable for use as a park.

In May 2001, upon completion of surface soil grading activities within this area, additional soil samples were collected, screened by field testing, and select samples were submitted for analysis of pesticides, including DDT. Field testing and analytical laboratory results confirmed that no DDT concentrations were present exceeding the EPA action level. On August 21, 2001 EPA issued a second letter to County of Los Angeles Department of Parks and Recreation stating that the area was suitable for use as a park.

In conclusion, soil sampling has been conducted within the undeveloped property on 204<sup>th</sup> Street, both for purposes of protecting the former residential use as well as assessing the suitability for use as a park. The results indicate that the soil from where the dust originates does not contain harmful levels of DDT.

CATEGORY: Airborne Dust

SOURCE: 2

## PART III: RESPONSE SUMMARY

## VAPOR TREATMENT

COMMENT #4

Specify how the extracted vapors will be treated under preferred alternative No. 4. We want to make sure dioxins or other chemicals are not created from a combustion technology.

DEL AMO ACTION COMMITTEE (DAAC) REQUESTS THAT THERMAL INCINERATION TECHNOLOGIES BE TAKEN OUT OF THE REMEDIATION OPTIONS FORMALLY. DAAC also requests that EPA provide funding for an independent expert selected by DAAC to review and comment upon any proposed remedial action proposals.

RESPONSE

A range of vapor treatment technologies were discussed in the Feasibility Study. A thermal/catalytic oxidizer was assumed for cost estimating purposes but three other technologies were also identified in the Proposed Plan as part of the preferred alternative. The four vapor treatment technologies were identified in the Proposed Plan as being possible technologies to use as components of the SVE systems. The Proposed Plan stated that any or a combination of the four technologies could be used, and that the decision on which to use would be made during the remedial design. The four identified technologies are adsorption, condensation, thermal oxidation, and internal combustion.

This ROD selects the same four technologies as identified in the Proposed Plan, and specifies that any or a combination of the four technologies could be utilized to treat the vapors extracted from the SVE systems. The technology or combination thereof could differ among the various source areas. A number of factors will be considered and input from interested stakeholders will be obtained during the remedial design process in selecting the vapor treatment technology or technologies to use. A similar stakeholder forum as used during the Waste Pits design process would be utilized to involve and obtain input from stakeholders (such as the current Partnership). Concerns relating to performance capabilities, combustion by-products, air discharge regulatory limits, dioxin formation, greenhouse gas formation, impacts to neighboring businesses and residents, and other criteria of concern to stakeholders will be considered in the design decisions.

EPA has a program called Technical Assistance Services for Communities whereby EPA could fund an independent consultant to provide technical consulting services for community groups interested in a particular Superfund site. The program does not have the flexibility to allow DAAC to select its own independent expert. EPA is currently working in partnership with the Del Amo Action Committee (DAAC) to utilize this program to address priority issues.

CATEGORY: Treatment of Extracted Vapors

SOURCE: 3

PART III: RESPONSE SUMMARY

NAPL TREATMENT AREA

COMMENT #5

You should expand the treatment area for chemical oxidation to treat as much of the source contamination as possible.

Please provide more information about the constraining factors and how they impact the effectiveness of the proposed treatment plan, including how an “unconstrained” plan would differ from the proposed plan. The more source contamination that is removed the better.

RESPONSE

The In-Situ Chemical Oxidation treatment areas will focus on NAPL-impacted soil at the “source areas.” The actual size and configuration of the treatment zones will be determined during remedial design, based on soil core observations, laboratory analytical results for soil and groundwater samples, and Ultra Violet Optical Screening Tool (UVOST) logs from each area (UVOST is a field screening technique which identifies hydrocarbon impacted soils). The intent of the ISCO program using these tools is to treat as much of the NAPL-impacted source area as possible.

The main limitation to applying ISCO is the presence of existing buildings, where it would not be possible to install injection or SVE wells inside buildings. There could possibly be utilities or pipelines in locations whereby it would not be possible to install wells or injection points.

While ISCO will be limited to NAPL-impacted source areas, it is anticipated that the treatment will provide the additional benefit of increasing the oxygen content in groundwater, enhancing biodegradation of dissolved phase constituents down-gradient of the treatment area.

CATEGORY: Source Removal

SOURCE: 3

## PART III: RESPONSE SUMMARY

## VAPOR INTRUSION

COMMENT #6

There should be an ongoing vapor intrusion monitoring plan.

Regardless of how the EPA sections up, divides, or otherwise segments this area that is impacting public health and the environment, EPA needs to have an ongoing vapor intrusion monitoring plan and EPA must ensure it is implemented. The impacts of on-going vapor intrusion are far too critical for the EPA to refuse to even monitor whether such intrusion—and the harm it causes—is occurring.

RESPONSE

Out of all the areas related to the Del Amo Superfund Site, including areas related to OU-1 “Soil & NAPL,” OU-2 “Waste Pits,” and OU-3 “Dual-Site Groundwater,” there are some areas that warrant further vapor intrusion assessment and other areas that do not. Within the OU-1 area, there are two parcels warranting further monitoring and/or remediation. Within the OU-2 area, ongoing soil vapor monitoring is warranted and is currently being conducted. In the OU-3 area, there are some areas where soil vapor monitoring has recently been conducted and further monitoring will be conducted, and other areas where additional monitoring could be pursued. Further details for each area are described in the following paragraphs.

**Operable Unit 1 “Soil & NAPL”**

Operable Unit 1 (OU-1) refers to the soil within the former plant property, excluding the Waste Pits area.

Indoor air data were collected between 1993 and 1995 from 13 buildings within the OU-1 area and were presented comprehensively in the 2001 Workplace Air Monitoring Program Report (in addition to being reported in interim reports in the years of the sampling). Buildings were selected for indoor air sampling because (a) their footprint covered a former plant site VOC-facility location; and/or (b) they were located immediately adjacent to an area of soil contamination, known from 1993 soil gas data to have VOC contaminant concentrations in excess of threshold values. The indoor air data was compared to screening levels available at the time to ascertain whether an immediate risk was present that warranted immediate action. It was determined that no immediate risk was present. The indoor air data was then used in the risk assessment to determine whether there was any long-term risk. Such risk was calculated for all buildings at the site. Indoor air data was used for buildings where it had been collected. Where indoor air data were not collected, potential indoor air risk was modeled using soil vapor, soil matrix, and groundwater data. An estimated indoor air risk was calculated for each property and results are presented in the 2006 Baseline Risk Assessment.

Based on the estimated indoor risks presented in the 2006 Baseline Risk Assessment, there were five properties that exceeded acceptable risk levels. The indoor risks were estimated based on modeling vapor migration from surrounding soil samples (not from indoor air sampling). The primary risk driver was generally benzene. Because benzene biodegrades over time, subslab samples were collected beneath the buildings at each of these five properties to confirm whether actual subslab concentrations correlate with the estimated indoor air risk that exceeded acceptable risk thresholds. The subslab results demonstrated that three of the five properties did not have concentrations exceeding the risk thresholds and therefore would not require remediation or further assessment of vapor intrusion. The OU-1 ROD addresses the indoor air pathway at the two remaining properties (Areas 16 and 23). Remedial actions selected consist of soil vapor extraction beneath one of the buildings and building engineering controls for the other building. In addition, soil vapor and/or indoor air monitoring activities

## PART III: RESPONSE SUMMARY

will be required at both areas. However, based on the results of the risk assessment for OU-1, there is not a current need for an OU-wide vapor intrusion monitoring program.

**Operable Unit 2 “Waste Pits”**

Operable Unit 2 (OU-2) refers to the Waste Pits area, located at the southern end of the former Del Amo Plant boundary. The Waste Pits ROD was signed in 2000 and includes a RCRA cap and soil vapor extraction system to remediate benzene and other VOCs in soil. Both the RCRA cap and the SVE system include monitoring to ensure that contaminants in soil vapor do not migrate beyond the limits of the treatment area. The monitoring system includes 12 perimeter monitoring wells that surround the Waste Pits. The samples collected from these vapor monitoring wells show that contaminants in shallow soil vapor are not migrating away from the Waste Pits area. EPA will continue to monitor vapor concentrations at these perimeter wells in accordance with the OU-2 remedy.

**Operable Unit 3 “Dual-Site Groundwater”**

Operable Unit 3 (OU-3) refers to the Dual-Site Groundwater areas, including the areas associated with dissolved phase groundwater contamination from the former Montrose plant property, the former Del Amo rubber plant property, and other facilities on Normandie Avenue. A number of soil vapor sampling and vapor intrusion evaluations have been conducted at various locations within the OU-3 area.

A 1995 Health Consultation by ATSDR evaluated 1994 indoor air data collected at the 25 residences on 204<sup>th</sup> Street. The consultation concluded that contaminants were either below the Los Angeles County indoor air reference levels and/or below ATSDR’s health comparison levels. It also concluded that the sources of contaminants could not easily be ascertained because the majority of the levels were comparable to levels in properties not impacted by either the Superfund sites.

The 2004 Public Health Assessment modeled potential vapor migration and vapor intrusion into residences using groundwater contaminant concentration data. The assessment found that this potential exposure pathway would not exceed the risk threshold levels established by DHS.

Soil vapor sampling investigations have been conducted and are still being conducted within OU-3 areas that are on or immediately surrounding the former Montrose Plant property as part of the OU-3 DNAPL investigation and feasibility study, OU-1 remedial investigation, and OU-7 remedial investigation. The investigations include sampling and evaluating soil vapor data within the Montrose former plant property and on adjacent commercial properties north and south of the former plant property. Plans are underway to expand these sampling activities. The investigations have also included indoor air sampling in commercial buildings north of the former plant property, and plans are underway to conduct similar sampling south of the former plant property.

EPA recognizes that further evaluation of vapor intrusion potential within the residential areas of the OU-3 area could be conducted. Such evaluation would first evaluate existing data to determine whether data gaps exist for which additional sampling is warranted.

CATEGORY: Vapor intrusion (see also comments #1, 2, 7)

SOURCE: 3

## PART III: RESPONSE SUMMARY

## VAPOR INTRUSION

COMMENT #7

How old are the vapor intrusion studies that have been done, if any, and would you please send a copy of them to the Del Amo Action Committee office?

EPA has recently admitted that there are large data gaps in their information for the site, as this response will further highlight. EPA must properly evaluate and address this important avenue of harm. We request additional copies of these documents. We have tried to access the soil vapor study on EPA's website and the file states it is "corrupted and un-repairable" and therefore I am unable to download it. Please fix this problem and forward two copies of these documents to us as soon as possible.

RESPONSE

The first vapor intrusion studies began in 1994-95 for the 204<sup>th</sup> Street residential area. The evaluation utilized indoor air sampling conducted in 1994, and the assessment was conducted in 1995 (DHS Health Consultation).

Subsequent vapor intrusion studies were conducted as part of the former rubber plant Baseline Risk Assessment, completed September 7, 2006. This assessment utilized soil, soil gas, indoor air, and groundwater data collected from 1993 through 2004.

Further vapor intrusion evaluation was conducted in 2008-9, when soil vapor samples were collected beneath the floor slabs of several existing buildings located within the former rubber plant property. The results of the laboratory testing were presented in an April 2009 Technical Memorandum.

In addition to the evaluations noted above, soil vapor monitoring occurs monthly at the Waste Pits Area within the perimeter monitoring well system.

Copies of the Baseline Risk Assessment and the Technical Memorandum have been provided to the DAAC, in addition to the Remedial Investigation (RI), Feasibility Study (FS), Public Health Assessment (PHA), 5-Year Review (5YR) and Proposed Plan. (The 5YR contains the Waste Pits Area regular soil vapor monitoring results).

EPA's Draft Guidance for Evaluating Vapor Intrusion to Indoor Air (EPA530-D-02-004) describes using multiple lines of evidence for evaluating the potential impacts of the vapor intrusion pathway to indoor air, including modeling migration from groundwater and soil, conducting sampling beneath structures (subslab) and within structures (indoor). The Del Amo investigation followed these concepts, as evidenced by the variety of sampling and evaluations conducted (indoor air and subslab sampling, soil vapor monitoring, and modeling from groundwater).

CATEGORY: Vapor Intrusion (see also comments #1, 2, 6)

SOURCE: 3

## PART III: RESPONSE SUMMARY

## HEALTH/RISK ASSESSMENT

COMMENT #8a

How old is the risk assessment? If old, what has been done to incorporate new science. How have cumulative impacts been addressed?

DAAC believes that risk assessments are based on made up information and the numbers mathematically manipulated by the assessor and never end up being protective enough given that fact that many of these chemicals have no risk information available. DAAC requests EPA work with DAAC and others to develop a process that is truly reflective of current trends and methods to address cumulative impacts and sensitive receptors.

RESPONSE

The risk assessment for the soil and NAPL operable unit was approved by EPA on October 23, 2006. The methods and procedures presented in the document are consistent with current EPA guidance. EPA is not aware of new science that, if applied, would materially change the conclusions of the risk assessment. Risk assessment findings for several parcels within the former rubber plant were revised in the final Feasibility Study report, approved by EPA on February 2, 2010. When there are multiple chemicals of concern present, the cumulative risk was estimated by adding together the individual risks for each chemical.

EPA risk assessments follow established guidance, "Risk Assessment Guidance for Superfund" (EPA/540/1-89/002 and associated update appendices). This guidance represents established, robust, accepted scientific methodologies.

In the case of Del Amo OU-1, EPA is confident the risk assessment provides a reliable assessment of potential risks for the potential OU-1 receptors, and EPA is utilizing this assessment to support the OU-1 ROD. The OU-1 ROD selects remedial actions to address these risks. EPA does identify in the ROD the situations where further assessment of potential risk could be needed in the future due to new development or construction activities at a parcel. Specifically, the ROD specifies that in the future, construction activities within OU-1 that involve contact with the soil will require evaluation of potential contact with site-related contaminants. This evaluation could include additional environmental sampling and risk evaluation, as well as remediation.

COMMENT #8b

We have attached a list of questions about risk assessment that we would like EPA to answer. These questions are attached to the end of this document.

**Additional risk assessment questions and responses:**

**a.** What assumptions are you making? Please provide a comprehensive list of all of the assumptions that will go into the risk assessment and how those assumptions could impact the validity of the results.

RESPONSE: The Baseline Risk Assessment (BRA) for the Soil and NAPL OU was completed by Geosyntec Consultants and URS in September 2006 and the EPA approved document is available electronically online at:

<http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/Del+Amo+Facility?OpenDocument>

Hard copy of the document is available at the following two public repositories:

## PART III: RESPONSE SUMMARY

Carson Public Library  
151 East Carson Street  
Carson, CA  
Phone: (310) 830-0901

Katy Geissert Civic Center Library  
3302 Torrance Boulevard  
Torrance, CA  
Phone: (310) 618-5959

Risk assessment guidance requires the use of numerous assumptions which are comprehensively discussed in the BRA. The risk assessment used very conservative (high-end) values for exposure, toxicity, and contaminant concentration values to estimate Reasonable Maximum Exposure (RME) risks. This approach assumes, for example, that individuals who are most sensitive to the potential cancer effects of a chemical will also have a breathing rate and exposure duration that exceeds most of the population. With numerous high-end exposure assumptions combined, risks are typically overestimated for the population, meaning that virtually all potentially exposed individuals will have a much lower level of risk than the estimated RME risks presented in the BRA. The assumptions used in the risk assessment are intentionally conservative in nature and health-protective.

While assumptions are discussed throughout the BRA, Section 7, "Assessment of Uncertainty," focuses on many of the assumptions used and their influence on the results. Additionally, specific values assumed for various parameters used in the risk calculations are presented in Tables 13 through 19 of the BRA.

**b. How will you handle uncertainty? Will you treat missing or incomplete toxicity data as posing no risk? Will the risk assessment include probabilistic analyses?**

RESPONSE: Discussion of uncertainty is closely related to the discussion of assumptions, as mentioned above and in the BRA. The use of assumptions in the BRA necessarily results in some uncertainty regarding the results. However, the assumptions used for the RME estimates of risk are intentionally very conservative, resulting in a high-end, over-estimate of risk which compensates for potential inaccuracies introduced through assumptions and other uncertainties.

The primary constituents of concern (COCs) at the Del Amo site are generally well understood with respect to toxicity. For cases where the available information is less complete, the best available information was used. In some cases, this means the use of data for similar, surrogate compounds that are believed to have similar toxicities. The BRA did not assume such chemicals posed no risk.

The approach used to calculate the risks was not probabilistic in that it did not randomly simulate numerous exposures and model the outcomes to reach its conclusions. By design, the most probable risk to an individual is much less than RME estimates.

**c. What are the factors that most influence the results?**

RESPONSE: Numerous factors influence estimates of risk; however, the more influential factors in the BRA include the COC concentrations, the toxicity of the individual COCs, and the duration/magnitude of the exposure to the COCs.

**d. Do you know the relationship between every type of exposure (i.e., each chemical, multiple chemicals, cumulative and synergistic effects) and all toxicological endpoints (i.e., cancer, mutagenicity and genetic toxicity, reproductive effects, developmental effects, immunological effects, endocrine disruption, neurological effects, effects on organs, and respiratory effects)?**



## PART III: RESPONSE SUMMARY

RESPONSE: The risk assessment process utilizes information on the toxicity of a COC and how people are exposed. The toxicity information is based on data from the EPA Integrated Risk Information System (IRIS) or other EPA sources and considers both cancer effects (including mutagenicity data) and non-cancer effects. Potential risk for carcinogens is estimated for each chemical and then the total carcinogenic risk is determined by adding the estimated risk for all identified COCs. The particular type of cancer that may be associated with the COCs is not considered. The estimated risk is the probability, above the background cancer incidence rate, of contracting any type of cancer as a result of this exposure. For chemicals that are evaluated based on potential non-carcinogenic effects, the potential hazard of exposure is determined for each chemical, and then the hazards are added for all COCs similar to the process used for carcinogens. However, the hazards are also considered by the target organ that is potentially effected (liver, kidney, etc.). This process is consistent with EPA's Risk Assessment Guidance for Superfund (RAGS).

The potential synergistic and antagonistic effects of exposure to multiple chemicals is not considered in the risk assessment process because there are not sufficient scientific data at this time on the interaction of specific chemical mixtures. Until data are available to quantitatively evaluate these interactions, the conservative (i.e., health protective) approach adopted by EPA for Superfund is to consider the effects additive.

e. Which exposure pathways are you considering? Are you considering exposure related to soil vapor intrusion? Are you considering inhalation of outdoor air, indoor air, and exposures through baths and showers? Are you considering the ingestion of soil, surface water, ground water, homegrown produce, meat, dairy, vegetables, fish, shellfish, and breast milk. Are you considering dermal absorption through exposures to soil, water, and foliage?

RESPONSE: The risk assessment for OU-1 "Soil and NAPL" considered the following potentially complete exposure pathways:

- Ingestion of soil;
- Direct contact with soil and absorption of chemicals through the skin;
- Inhalation of dust generated from soil;
- Inhalation of vapor emanating from soil or soil gas into outdoor air; and
- Inhalation of vapor emanating from soil, soil gas, or groundwater into indoor air.

These exposure pathways were considered the most relevant at the site for commercial and hypothetical residential land use. Direct contact, ingestion and shower exposures for groundwater were not evaluated in this risk assessment because a groundwater risk assessment had been performed previously for the Dual-Site Groundwater Operable Unit. Exposures to surface water were not evaluated in this risk assessment because surface water bodies are not present at the Del Amo Site. Home agricultural, aquiculture, breast milk and foliage exposure routes were not evaluated for this operable unit because they were not determined to be exposure pathways for this Site and operable unit.

This ROD includes institutional controls that will prohibit future residential land use on 26 parcels, since their potential risk exceeded acceptable levels for such use. The ICs also will prohibit any drilling into groundwater at many properties on the site, which reduces or eliminates the possible risk of exposure to contaminated groundwater.

## PART III: RESPONSE SUMMARY

**f.** Will exposures and dose be independently verified or based upon real world measurements, such as air quality monitoring and biomonitoring?

RESPONSE: Exposure and dose are specific to each of the available pathways by which individuals could be exposed (i.e., ingestion, inhalation, direct contact, etc.). For each pathway and COC, the dose was calculated by multiplying the Exposure Point Concentration (EPC) by an intake factor. The EPC is based on real world data, specifically, the laboratory analytical results for samples from the various exposure media for the site (i.e., soil, groundwater, indoor air, etc.). The quality of this data is ensured through EPA oversight, use of accredited laboratories, quality assurance/quality control samples (including duplicates) to evaluate laboratory precision and accuracy, and data validation procedures.

The intake factor was calculated according to accepted formulas using conservative estimates of ingestion/inhalation rates, exposure frequency and duration, body weight, etc., for the receptor population being evaluated (i.e., commercial worker, potential future resident, or construction trench worker), that are compiled in various EPA guidance documents and based on peer-reviewed and documented scientific research.

Dosage was not independently verified with air monitoring and biomonitoring. Although indoor air monitoring was conducted, it was found that site-specific chemicals were too ubiquitous in the surrounding environment to ascertain contributions from the contaminated soil itself. Therefore, modeling of potential exposure and dosage was done based on the measured soil contaminant concentrations. The same applies to biomonitoring, whereby the presence of site-specific contaminants in a body would not be indicative of the actual source, since the site-specific contaminants are ubiquitous in the environment from non site-related sources.

**g.** Will you be using validated and certified fate and transport models to determine dose and exposures?

RESPONSE: The approach, formulas, and parameter values used in the risk assessment were reviewed and are consistent with EPA- accepted methods and guidelines. The vapor migration model used is a validated model.

**h.** Will the risk assessment consider multiple, additive, cumulative, and synergistic impacts?

RESPONSE: Toxicity data are generally available only for individual chemicals. The risk assessment assumes that toxicity from exposure to multiple COCs is additive, and the estimated cancer risks and hazard index for the individual COCs are therefore summed (cumulative) to estimate total cancer risk and hazard index. Exposure to multiple chemicals does involve some uncertainty, as unknown synergistic interactions between chemicals are possible, potentially leading to underestimates of risk. This is acknowledged in the risk assessment, and compensated for through the use of conservative, health-protective assumptions and input parameter values in the risk calculations.

**i.** How will qualitative data be incorporated into the risk assessment?

RESPONSE: The risk assessment process itself does not incorporate qualitative data. However, EPA considers qualitative data together with the risk findings during the remedial decision making process, as documented in the Record of Decision (ROD).

**j.** Who will make risk management decisions and what criteria will they use when making those decisions? Will those decisions be made before or after the risk assessment has been conducted? Once made, will those risk management decisions be subject to change and, if so, by whom and under what circumstances?

## PART III: RESPONSE SUMMARY

RESPONSE: USEPA will make risk management decisions in the form of determining whether remedy implementation is necessary (for those cases in which risk falls within the discretionary range), and what the remedy will consist of. EPA uses the criteria specified in the National Contingency Plan, section 300.430(e)(2)(i), in making its decision about whether remedial action is warranted at a Superfund site. As described in a prior response, the NCP states:

*(1) For systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety;*

*(2) For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between  $10^{-4}$  and  $10^{-6}$  using information on the relationship between dose and response.*

EPA uses the  $10^{-4}$  (1 in 10,000 risk) to  $10^{-6}$  (1 in a million risk) range as a "target range" within which EPA strives to manage risks as part of a Superfund cleanup. Once a decision has been made to take an action, it is EPA's preference to achieve the more protective end of the range (i.e.  $10^{-6}$ ), although achieving reductions in site risks anywhere within the risk range may be deemed acceptable by the EPA.

The risk management decisions are made in the ROD after the BRA, RI, and FS are completed. These decisions rely upon the risk assessment. The BRA had been previously completed, as have the RI and FS. This document constitutes the ROD. EPA is responsible for protecting human health and the environment, but it must also consider public acceptance as well as technological, economic, social, and political factors when arriving at a risk management decision. This evaluation is formally conducted as part of the nine criteria evaluation presented in the Proposed Plan and the ROD.

After issuance of the ROD, the remedy will be implemented, with remedial systems in place being regularly maintained and monitored. Once in place, the remedial actions are subject to 5 year reviews (5YR) that evaluate whether or not the remedy remains protective. The 5YR process continues as long as contamination remains on-site. Decisions made in the ROD can be revised in the future through a "ROD Amendment," or an "Explanation of Significant Difference," if significant changes in site conditions become known or it is determined that the selected remedy is unable to achieve its goals of protecting human health and the environment.

**k. Are you willing to consider any of the alternatives to risk assessment, such as a health impact assessment, an alternatives assessment, or a community health assessment?**

RESPONSE: In the Superfund program, risk assessments help answer several questions, such as which sites need cleanup, which areas of a site need cleanup, which contaminants need cleanup, and how much cleanup is needed. Health impacts associated with environmental exposures generally cannot be directly isolated and measured. Because of this, EPA scientists and others have spent more than two decades developing an extensive set of risk assessment methods, tools, and data to estimate environmental health risks. Although significant uncertainties remain, this risk assessment methodology has been extensively peer-reviewed, is widely used and understood by the scientific community, and continues to expand and evolve as scientific knowledge advances.

There are other community health evaluations that have taken place at the Del Amo and neighboring Montrose Superfund sites. For example, the California Department of Public Health (formerly California Department of Health Services) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) has conducted a number of Public Health Assessments (PHAs). The PHA is

PART III: RESPONSE SUMMARY

a document that provides the communities with information on the public health implications of specific hazardous sites and identifies those populations for which further health actions or studies are indicated. The Del Amo PHA (2004) can be found at: <http://www.ehib.org/papers/FinalDelAmoPHA.pdf>

CATEGORY: Health/Risk Assessment (see also comments #9, 10)

SOURCE: 3

## PART III: RESPONSE SUMMARY

## HEALTH/RISK ASSESSMENT

COMMENT #9

What is the difference between the federal and the state screening numbers?

These screening numbers typically include conservative assumptions about exposure scenarios but they don't protect against every exposure possibility. In addition, as with all things relying upon risk calculations, they have assumptions built in about dose-response relationships and don't deal with the possibility of synergetic or cumulative impacts. Look at work on risk assessment and you'll see that the critique applies here. Given these facts, we would like more information about the values relied upon and how they were developed.

RESPONSE

Many of the screening criteria used in the Del Amo OU-1 Remedial Investigation and Feasibility Study (RI/FS) for soil, indoor air and groundwater are risk-based values set by both state and federal regulatory agencies. For the purposes of the Del Amo RI/FS, the more conservative (lower) of the state or federal values was used when they differed.

The screening step in the risk assessment used the federal screening values (known at the time as "Preliminary Remediation Goals" or "PRGs") to identify chemicals of potential concern on each parcel. Those chemicals present on a parcel at concentrations above the screening levels were then used in the risk calculation for that individual parcel. Those risks were calculated cumulatively – the risk from each chemical was added together.

Screening levels (formerly known as PRGs) were developed by EPA to estimate contaminant concentrations in environmental media (soils, air, and water) that are protective of human exposures (including sensitive groups) over a lifetime. Screening levels were developed for both industrial and residential settings because of the different exposure timeframe (workers would be exposed for 8 hours/day, 5 days/week whereas residents would be exposed 24 hours/day, 7 days/week). The screening values represent concentrations at or below which are unlikely to pose a health threat, and above which suggests that further evaluation is necessary. Concentrations exceeding a screening level do not automatically determine that a health threat exists, only that further evaluation is necessary.

For more information on the exposure pathways and scenarios used in EPA's screening levels, please visit <http://www.epa.gov/region9/superfund/prg/> and in the text box on the right click on either "Frequently asked questions" or "User's Guide".

Screening levels do not replace Human Health Risk Assessments performed by EPA or Public Health Assessments performed by the California Department of Public Health (under a cooperative agreement with the Agency for Toxic Substances and Disease Registry, "ATSDR"). Screening levels are just the first step in a risk assessment. Both risk assessments and public health assessments take into account cumulative impacts due to multiple contaminants and multiple exposure pathways.

Synergistic effects (that is, exposure to two or more chemicals producing more of a health effect than would be expected by adding the chemical exposures together) are not accounted for in risk assessment calculations. The Del Amo risk assessment discusses this as a factor of uncertainty. If synergistic effects were a possibility for certain chemicals found at Del Amo, it is unlikely that synergism would occur at EPA's screening level concentrations, since these values are set well below health effect levels.

CATEGORY: Cleanup Goals (see also comments #8, 10)

SOURCE: 3

PART III: RESPONSE SUMMARY

HEALTH/RISK ASSESSMENT

COMMENT #10

What has been done to investigate the health of the workers who redeveloped the site?

What is the federal EPA responsibility to follow up on past worker exposure when gross contamination issues are substantiated? Do you have to report this information to OSHA? I would like to ensure that EPA reports their findings to the appropriate agencies that will follow up with workers who can be identified, posting in the paper (trade and otherwise) and specific unions employing the types of employees possibly affected. As a victim of unexplained illness' myself it is extremely import for people to know what they have been exposed to since in these situations they must become their own best health advocate because general physicians receive little or no environmental occupational health training.

RESPONSE

Under the Superfund law, EPA is not granted the authority to investigate the health of the workers who had redeveloped the site. Redevelopment of the former plant property began in 1973 and continued until the mid-2000's. The majority of the land parcels were redeveloped by 1992, when EPA first became involved at the site. Prior to EPA's involvement, the California Department of Health Services (DHS) had overseen limited environmental investigations at the site.

CATEGORY: Health/Risk Assessment (see also comments #8, 9)

SOURCE: 3

COMMENT #11

Why has a technical impracticability waiver been established and where is the TI waiver zone?

First, we would have appreciated a response to the question that provided a focused, clear reason for why the TI waiver was used. Further, DAAC resents that large areas of the community have been determined to be waste zones. The TI waiver zone must not include any residential areas. This type of decision is exactly the kind that can and must be made along with the impacted community members and DAAC requests a focused discussion with experts to revisit this decision. DAAC views any decision to leave contamination beneath our neighborhood and homes as completely unacceptable. EPA should either get the contamination out from under our homes or get the people out of the contamination zone. Since EPA says that it will take more than 100 years to get the contamination out from under the homes, the only option is to move people out of the area. DAAC asks for EPA's support in making this happen.

RESPONSE

The Dual Site Groundwater Record of Decision (OU-3 ROD) includes a containment zone for groundwater that immediately surrounds the concentrated benzene and chlorobenzene non-aqueous phase liquids (NAPL). The benzene NAPL is located within the Del Amo former rubber plant area, and the chlorobenzene NAPL is located within the Montrose former plant area. Attaining groundwater standards in the NAPL-impacted areas would require almost complete elimination of the NAPL from the ground, which EPA determined to be technically impracticable to achieve. The NAPL-impacted areas, as well as a zone of dissolved phase contamination surrounding those areas, were therefore designated a containment zone (not a "waste zone"). Within that zone, groundwater cleanup standards were waived on the basis of technical impracticability. When containment is achieved, the containment zone will serve to isolate the NAPL, thus making it possible to clean up and restore the groundwater outside that zone.

There is an area of the benzene containment zone south of Del Amo that overlaps the undeveloped buy-out area and a small portion of residential area. (See figure). In this area, benzene levels have decreased to very low concentrations of 10-20 ppb (MCL is 1ppb). The groundwater starts 40-50 feet below ground surface in this area, and resides in fine grained sand. **These conditions do not pose a vapor intrusion threat to residents.** Any benzene vapor rising from the groundwater biodegrades well before it reaches the shallow soil. Monthly soil vapor monitoring within the undeveloped buy-out area shows that soil vapor concentrations are consistently well below the California Human Health Screening Level (CHHSL) for vapor intrusion potential in a residential setting. The presence of the containment zone does not pose a risk to the residents or to a future use of the undeveloped buy-out areas as a park.

The basis for and technical specifics of the TI Waiver Zone are explained in Section 10 of the ROD for the Montrose/Del Amo Dual Site Groundwater Operable Unit (OU-3). A summary explanation of the TI Waiver Zone concept is provided below.

As noted above, it is technically impracticable to attain cleanup levels inside the containment zone because the NAPL continues to dissolve into the groundwater there. Therefore, the containment zone is also called the Technical Impracticability (TI) waiver zone. The size of the TI waiver zone in the benzene plume is somewhat larger than the actual NAPL distribution. This is because the ability of a groundwater pump and treat system to decrease the extent of the benzene plume is very limited given the proximity of the LNAPL sources to the edge of the plume. The Waste Pits and the Benzene Pipeline areas, the two

PART III: RESPONSE SUMMARY

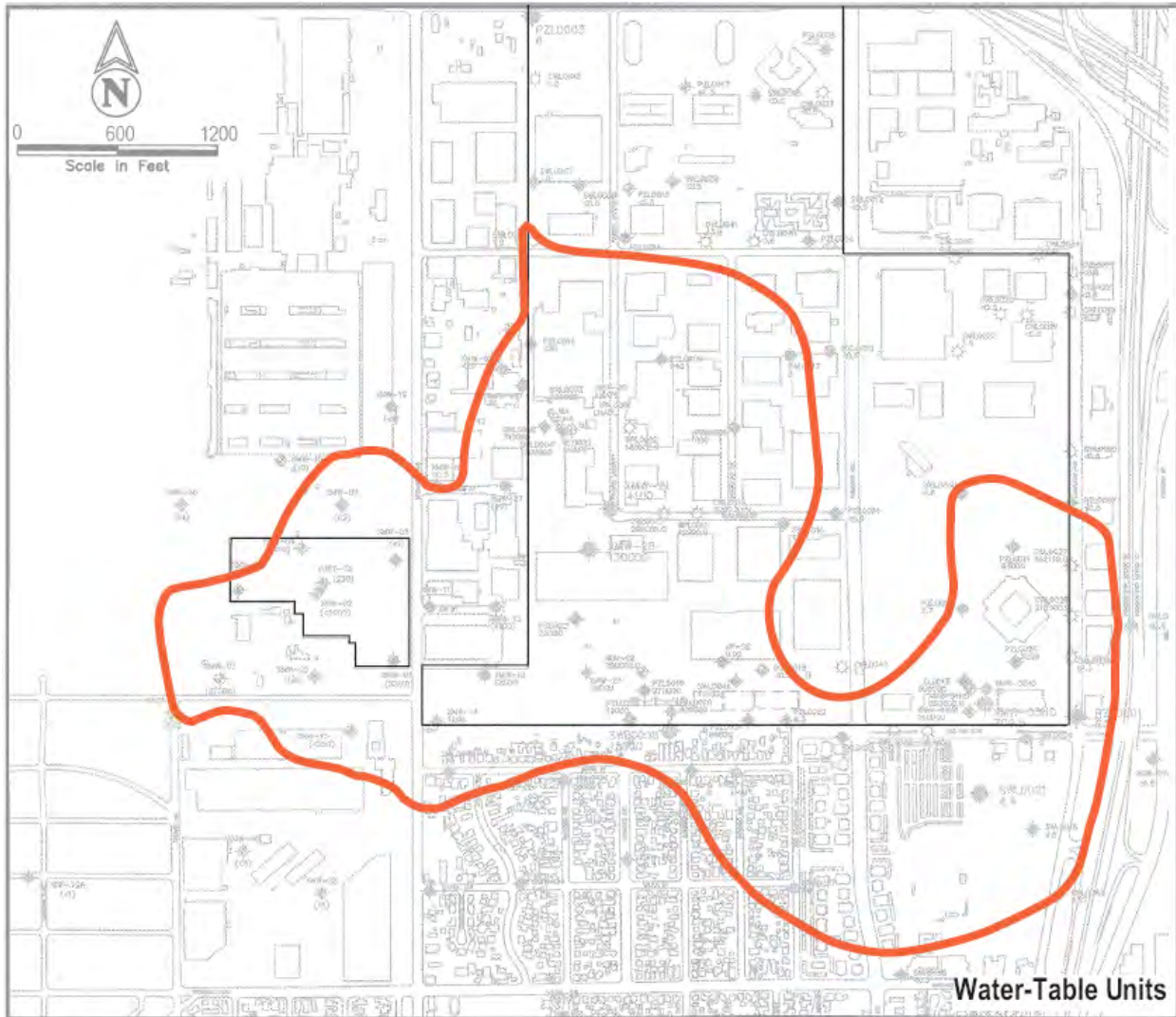
LNAPL source areas near the leading edge of the plume, are both only 1100 to 1200 feet from end of the plume. The size of the areas downgradient of these sources that would be able to be restored would not likely exceed several hundred feet. Furthermore, the restoration of this limited area will never be complete due to the continuing dissolution of LNAPL into groundwater. For these reasons, the Groundwater remedy does not attempt to reduce the volume of the benzene plume.

**Follow-up Response:** This OU-1 ROD does not address decisions made by the OU-3 Groundwater ROD. The decision to establish the containment zone (also known as the TI waiver zone) was made in the Groundwater ROD, which was signed twelve years ago (March 1999). The OU-1 ROD (this ROD) addresses the sources of benzene NAPL that are affecting the groundwater. A future Montrose ROD(s) will address the sources of chlorobenzene NAPL, which are located on the former Montrose plant property. EPA will engage with concerned community members regarding the TI waiver zone issue in the context of the Dual-Site Groundwater operable unit.

CATEGORY: TI Waiver Zone

SOURCE: 3

FIGURE: Technical Impracticability Waiver Zone – Water Table



(excerpt from Figure 10-1 “TI Waiver Zone for the Joint Site,” Record of Decision, Dual Site Groundwater Operable Unit)



## PART III: RESPONSE SUMMARY

## INSTITUTIONAL CONTROLS

COMMENT #12

How will you address the uncertainties around implementing zoning controls and restrictive covenant institutional controls?

More needs to be done to ensure future workers and the public are protected. On Kenwood Ave., at a particular property where DDT removal did not occur the community has been left to monitor the situation when it comes to sewer repairs, fence replacement and foundation repairs carried out by the land owner. These incidents have occurred and the site is treated as if the soil is not tainted with a layer of DDT sediment. Dirt is plied to the side or on the street in an uncontrolled manor and children play nearby or jump the piles of dirt with their bikes. DAAC wants EPA to ENSURE that the public and others in the area do not become responsible for the tasks EPA needs to undertake to prevent waste disruption.

Institutional controls are the weakest form of “protection.” EPA hasn’t even identified those at risk, as evidenced by our meeting where they admitted they did not know who might be exposed from vapor intrusion. How can they know where institutional controls are needed? How were the decisions made as to which properties would have zoning and deed restrictions?

RESPONSE

The selected remedy includes multiple layers of ICs – General Plan footnote and restrictive covenants constitute two of those layers. Current zoning at the Site prohibits residential use and other uses specified under the City’s “R” zoning designations. Pursuant to the ROD, restrictive covenants will be implemented at 26 of the parcels at the Site. The covenants are legally enforceable documents that “run with the land,” meaning that they apply to and are enforceable against subsequent owners. The covenants will prohibit residential use, and will prohibit drilling for groundwater. In addition, the covenants will require that any future construction plans at the properties be approved by EPA in order to ensure that no unacceptable exposures to Site contaminants occur.

The 26 properties at which the restrictive covenants will be implemented are those where long-term exposure to contaminated soils could result in an unacceptable risk if the properties were used for residential purposes.

EPA has found that ICs, particularly when layered (as described in Section 12.2 of the ROD), are effective remedial actions and complement active remedies for sites. If EPA later determines that the IC remedy components are not effective at preventing exposure, EPA may revise the remedy.

Through the implementation of the permit review institutional control, the agencies and potentially responsible parties will monitor activities within OU-1 that involve contact with the soil. This institutional control has already been implemented as a pilot and has been used for the past three years to monitor construction activities in the OU-1 area. The control works by having the Los Angeles Department of Building and Safety (the agency that handles building permits) refer permit applicants within OU-1 to the Superfund Environmental Review Team (ERT), consisting of EPA, DTSC and the Responsible Parties). The Superfund ERT communicates with the permit applicant, reviews the environmental data pertaining to their work area, and requires additional sampling and cleanup as needed.

PART III: RESPONSE SUMMARY

In addition, this ROD selects land-watch monitoring as a mechanism to monitor activities within the OU-1 area that could result in contact with the soil. Land-watch monitoring is a service whereby the selected contractor monitors construction permit activity (i.e. permit applications for construction, grading, well installation), land-use permitting activities, underground services alerts, and property transfers to identify activities that could come in contact with soil. The contractor notifies the EPA ERT when a permit for any activities of concern is applied for, and the team contacts the entities involved. These communications all occur in advance of actual soil work occurring. The land-watch monitoring has also already been implemented as a pilot and has been successful in preventing inadvertent contact with contaminated soil.

It should be noted that the example given in the comment pertains to DDT-contaminated soil in a residential area that is part of the Montrose Superfund Site.

CATEGORY: Institutional Controls

SOURCE: 3

## PART III: RESPONSE SUMMARY

LNAPL

COMMENT #13

Is the LNAPL smear zone at 25 feet getting bigger or smaller? What does this mean in terms of continued contamination?

DAAC requests that these smear zones be clearly indentified and presented to us in a briefing along with a projection of the time it will take for them to “degrade”. Further, DAAC requests more information as to how the observations that the groundwater levels are rising impact the overall treatment plan for this site.

RESPONSE

There are areas on the site where LNAPL has been inferred to exist in a “smear zone” caused by LNAPL that originally accumulated on the water table, and subsequently became trapped in sediment below the water table as groundwater levels rose. A general trend of gradually rising groundwater levels has been observed in many monitoring wells at the site. LNAPL smear zones that formed in this manner have been documented at a limited number of locations within the footprint of the former rubber plant beginning at depths ranging from approximately 35 to 50 feet below land surface. The LNAPL in these smear zones at the Del Amo site is slowly dissolving and degrading in the groundwater and thus the volume of LNAPL present is gradually decreasing through time. The LNAPL does provide a continuing source of groundwater contamination, which is one reason why EPA is selecting active remediation, including in-situ chemical oxidation (ISCO) and vapor extraction, at four onsite areas. In addition to the proposed active remediation, natural attenuation is occurring and the dissolved-phase groundwater plume is at stable to decreasing levels in areal extent and concentration.

The four LNAPL areas that will have active remediation are Source Area 3 (SA-3), SA-6, SA-11, and SA-12. Figure 12-1 of this ROD shows the location of each of the source areas. Modeling performed during the RI/FS estimated that natural flushing action would take 12,000 years to remove all the LNAPL in these areas. Active remediation would decrease the amount of time the LNAPL would remain in the environment, proportional to the amount of mass removed. For example, if 50% of the LNAPL mass is removed, the cleanup timeframe would decrease 50%, from 12,000 years to 6,000 years. However, this modeling did not account for natural biodegradation, so the cleanup timeframe would be considerably shorter.

The continued rise of the water table will affect the remediation plan by decreasing the volume of the vadose zone (unsaturated zone) and increasing the volume of the saturated zone. This would decrease the amount of soil where SVE would be utilized and increase the amount of soil where in-situ chemical oxidation would be utilized. One outcome of this shift is that more remediation would occur in-situ, since SVE extracts contaminants and treats them above-ground and in-situ chemical oxidation treats them in-situ (below the ground). Conceptually, this would result in fewer emissions to the atmosphere.

CATEGORY: LNAPL

SOURCE: 3

## PART III: RESPONSE SUMMARY

## OFF-SITE DISPOSAL

COMMENT #14

What will happen to soil that is excavated? We do not want soil to go to Kettleman City.

DAAC would seriously oppose the transfer of toxic waste from our sites to another community. This option should be taken out of the equation.

If EPA sends this waste to other communities over the objections of DAAC, DAAC requests that EPA disclose at least 60 days in advance of transfer exactly which communities will be receiving the waste, the characteristics of the waste, and that EPA inform the community forced to take this waste about DAAC's objections.

RESPONSE

EPA's selected remedy includes excavation and offsite disposal only for areas of impacted soil that may be encountered at the site in the future during development or construction activities. In addition, relatively small quantities of soil that are brought to the surface during the installation of planned remedial systems and during future sampling activities, may require transport and disposal at appropriately licensed offsite facilities. Any excavated soils meeting hazardous waste criteria are required to be disposed only at appropriately permitted and licensed treatment and disposal facilities. Decisions about where to send any impacted soils that are excavated at the site in the future will be based on the nature of the impacted soils requiring disposal, the status of the permits and licenses held by the facilities available to receive the soils at that time, and the requirements of EPA's "Off-Site Rule" (40CFR §300.440 "*Procedures for planning and implementing off-site response actions*").

Under the Off-Site Rule, EPA makes a determination of acceptability of any facility selected for the treatment, storage or disposal of CERCLA waste, pursuant to the requirements set out in the rule. The acceptability criteria include the facility having no relevant violations, such as deviations from regulations or permit conditions, that: (1) prevent releases of hazardous substances, (2) ensure early detection of releases, or (3) compel corrective action for releases. Because the facility must be acceptable under the Off-Site Rule at the time of the disposal of the CERCLA waste, EPA does not determine what facilities may or may not be acceptable in the ROD.

Other federal (and state) regulations govern the transportation and disposal of hazardous wastes too, including standards for generators (40 CFR Part 262), identifying hazardous waste (40 CFR Part 261), pre-transportation requirements (40 CFR Part 262 Subpart C), manifests (40 CFR Part 262 Subpart B), land disposal restrictions (40 CFR Part 268), and treatment standards (40 CFR Part 268 Subpart D).

Through the years of EPA's involvement at the Del Amo site, 99% of the soil that has been removed from the Site has met the criteria for being non-hazardous. This includes soil from sampling and well drilling, as well as removal actions taken during the course of property owners' construction activities.

EPA is always willing to providing timely, pertinent information to DAAC and any other member of the public regarding issues of interest. The Community Involvement Plan generally identifies the avenues through which EPA provides such information. EPA cannot commit to providing specific information within specific timeframes regarding selection of disposal facilities and timing of transport. These aspects of remediation involve constraints of other parties such as transporters and the receiving facility. EPA is willing to work with DAAC to provide such information in as timely manner as possible. EPA cannot commit to providing public notification of Del Amo related waste soil transfers to

PART III: RESPONSE SUMMARY

communities where the licensed treatment and disposal facilities are located. EPA also cannot commit to representing DAAC's position to outside parties.

CATEGORY: Waste Soil Disposal

SOURCE: 3

## PART III: RESPONSE SUMMARY

## COMMUNITY INVOLVEMENT

COMMENT #15

More community outreach and education is needed, based on the low turnout to this public meeting.

Let me clarify the original comment. EPA needs to ensure that there is a community involvement strategy that includes outreach properly developed for our community and opportunities for participation that are meaningful for the decisions EPA is making. DAAC and community residents want to be assured that we are provided with information in a timely manner and in a way that we can understand the options possible for addressing the contamination in our community. We want our comments and input shape the decisions that are being made and not just allow a box to be checked off on some stakeholder input form. We want to work with our Community Involvement and Environmental Justice site managers to ensure an outreach strategy has our input and is completed in a timely manner. The community involvement plan presented to us for our site at the June 30, 2010 meeting is a sham and reflects a cookie cutter document copied from some EPA policy document. DAAC requests to sit down with the appropriate staff to develop a truly relevant document that is specific to our community.

RESPONSE

EPA agrees that a robust outreach and education plan for the public will be important as we move forward to the remedial design and remedial action phases of this project. The Proposed Plan public meeting is just one public outreach activity. More outreach activities will continue to occur as EPA proceeds with design and implementation of the selected remedy. EPA has added an additional Community Involvement Coordinator to the project team and has developed a partnership with the Del Amo Action Committee (DAAC) and is currently creating an outreach strategy with integral input from DAAC.

EPA has worked extensively in the past with the Del Amo Action Committee and other stakeholders on the different aspects of work on this site (e.g., 204<sup>th</sup> Street investigation and buy-out, OU-2 Partnership).

CATEGORY: Community Relations

SOURCE: 3

PART III: RESPONSE SUMMARY

COMMENT #16

Please consider using the Los Angeles Department of Water and Power (LADWP) lot to house the excavation [vapor treatment] system, as well as covering the system or hiding the system with shrubs. Commenter is concerned with alarming the tenants and with maintaining all of the parking space.

RESPONSE

The details of the remediation system will be finalized during the remedial design phase of the project. Discussions will be held with the appropriate property owners and tenants, including the LADWP, to explain the remedial objectives and to understand the concerns of all stakeholders. The remediation system will be designed to achieve cleanup objectives and maintain worker and public safety, and will take into account concerns over disruption to tenants to the extent possible.

CATEGORY: Short Term Effectiveness

SOURCE: 4

PART III: RESPONSE SUMMARY

COMMENT #17

Please consider running piping for the planned vapor extraction system along the sidewalk or Hamilton Avenue rather than through the parking lot of 20101 Hamilton Avenue. Excavation would cause disruption in the parking lot and require offsite parking for tenants.

RESPONSE

A range of piping route options for the vapor extraction system will be evaluated during the remedial design phase of the project. Certain parameters will need to be met, however, such as the need to connect piping to the vapor extraction wells. The wells must be located within the contamination area, which does include portions of the parking lot. Flexibility exists as to the location of the vapor treatment unit, which will then influence the final piping routes. However, all piping will be installed below grade and will be sequenced to minimize the disruption to onsite activities. The EPA will maintain close communications with property owners and tenants throughout the remedial design process, to minimize impacts of the remediation system on site occupants and ongoing business activities.

CATEGORY: Short Term Effectiveness

SOURCE: 5



PART III: RESPONSE SUMMARY

COMMENT #18

During chemical injections please keep the affected area to a minimum and shield it from view.

RESPONSE

EPA will strive to minimize the areas required for chemical injection equipment and materials storage while balancing the need for maintaining safe operations and achieving remedial objectives. Where EPA determines it is appropriate, the final design for chemical injection equipment and material storage will incorporate fencing to provide security and to shield system components from view.

CATEGORY: Short Term Effectiveness

SOURCE: 5

PART III: RESPONSE SUMMARY

COMMENT #19

Please consider not installing vapor extraction treatment systems on the parking lot directly behind our buildings at 20280 and 20300 South Vermont Avenue. The best location would be in the LADWP easement.

RESPONSE

The details of the remediation system, including its location, will be developed and finalized during the remedial design phase. Discussions will be held with the appropriate property owners and tenants, including the LADWP, to communicate the remedial objectives and to understand the concerns of all stakeholders. The remediation system will be designed and located to achieve remedial objectives, and EPA will limit the disruption to onsite tenants and the public to the extent possible.

CATEGORY: Short Term Effectiveness

SOURCE: 6

PART III: RESPONSE SUMMARY

COMMENT #20

Make sure the treatment system equipment is well-screened by landscaping or fencing so as not to be unsightly or alarm potential tenants.

RESPONSE

Wherever possible, the equipment will be screened by fencing and/or landscaping. Fencing may also be needed for security purposes.

CATEGORY: Short Term Effectiveness

SOURCE: 6

## PART III: RESPONSE SUMMARY

## PRENTISS PROPERTY

COMMENT #21

The PCIG property, located at 1000 West 190th Street, should not be subject to institutional controls. PCIG has investigated and removed contamination to residential cleanup standards in consultation with EPA. The Site Closure Report was submitted to EPA and EPA sent PCIG a letter on February 13, 2002 stating "based on environmental data that you made available to us and the soil removal actions you under took on your property, EPA does not at this time anticipate the need for further investigation or remediation on your property."

RESPONSE

EPA has reviewed historical data for this property as well as the property-specific findings from the Baseline Risk Assessment. EPA has also reviewed the Site Closure Report referenced by the commenter and the owner's Phase II ESA. EPA identified a discrepancy between the raw data presented in the Phase II ESA, Appendix F, and the data presentation tables in the body of the report. Specifically, a hit of Araclor was assigned to soil boring B-2, where it really was in boring B-20. Consequently, the owner's removal action missed the highest Araclor occurrence. The remaining Araclor hit was then included in the data used by EPA in its risk assessment.

Prior to conducting the risk assessment, the data for the parcel were revised to reflect characterization and remediation activities completed by the owner's contractor, Arcadis, Geraghty and Miller, from 1997 to 1999. Historical data for two areas where soils were excavated as part of this remediation work were removed from consideration in the Baseline Risk Assessment. Data from the top three feet over the entire parcel were also removed from consideration due to the grading activities performed on behalf of the property owner. Using this revised data set, the Baseline Risk Assessment estimated the commercial risk for outdoor soil at the parcel to be  $4 \times 10^{-6}$ , due primarily to arsenic. The residential risk was estimated to be  $4 \times 10^{-5}$ , due primarily to arsenic and PCBs. EPA considers risks equal to or less than  $1 \times 10^{-6}$  to be acceptable. When estimated risks exceed  $1 \times 10^{-4}$ , EPA requires remedial action. Estimated risks between  $1 \times 10^{-6}$  and  $1 \times 10^{-4}$  fall within a discretionary risk range, where the EPA has discretion concerning appropriate response actions. The two sampling locations at the parcel responsible for the majority of the estimated risks are as follows:

<u>Location</u>	<u>Depth (ft)</u>	<u>Analyte</u>	<u>Concentration (mg/kg)</u>
B-23	5	Arsenic	12.1
B-20	7	Arochlor 1260	0.42

Sampling locations and associated data for this property considered in the Baseline Risk Assessment are provided in Appendix A of that report. Based on the estimated risks, EPA's Proposed Plan deemed the parcel to warrant a restriction against residential land use. The IC mechanisms proposed included information, permit review, a general plan footnote, and restrictive covenants.

In response to this public comment, EPA re-examined the data set for the subject parcel. EPA found that the data set was robust enough to warrant use of the 95 Upper Confidence Limit (95UCL) value rather than the maximum value in determining the exposure point concentration used to calculate the risk. This is consistent with EPA's Risk Assessment Guidance for Superfund (RAGS). The result of this is a residential risk equal to  $10^{-6}$ . Because the risk when utilizing the 95UCL value does not exceed  $10^{-6}$ , the

PART III: RESPONSE SUMMARY

parcel would not warrant restriction from residential use. Therefore, this ROD does not require the subject parcel to be restricted from residential use.

CATEGORY: Institutional Controls

SOURCE: 7

PART III: RESPONSE SUMMARY

COMMENT #22

CC&Rs for the Pacific Gateway Center already restrict use to commercial or industrial, so deed restrictions are not necessary

RESPONSE

Covenants, Conditions and Restrictions (CC&Rs) can be useful institutional controls for restricting use of a property or activities that could lead to exposure to contamination that may be present at a property. However, CC&Rs can be changed by the entity that created them, typically a property owner or association. The State and Federal government have no control over CC&Rs. Therefore, EPA cannot rely solely on CC&Rs as an institutional control on a property. Restrictive covenants are institutional controls that the State and Federal government can control directly. A restrictive covenant is a two-party agreement (that can also have a third-party beneficiary) whereby a property owner agrees to restrict use or activities on a property. Once signed, only the State government can remove the restriction. The State (or Federal government, if they are the third-party to the agreement) can enforce any violation of the agreement. The State or Federal government cannot enforce the provisions of a CC&R.

CATEGORY: Institutional Controls

SOURCE: 7

PART III: RESPONSE SUMMARY

COMMENT #23

Who would bear responsibility for the costs of any further site investigations or for any reductions in property values caused by EPA's proposed actions? Any remedy that is selected should clarify that the Del Amo responsible parties, rather than the current property owners, should bear any costs related to the remedy.

RESPONSE

The ROD selects remedial actions for the Site, but does not determine what entity is responsible for implementing that remedy or what entity should pay for the remedy. The cost of any further environmental investigations associated with releases from the Site would be the responsibility of the Potentially Responsible Parties (PRPs) identified by EPA. Generally, EPA enters into an enforceable agreement with the PRPs to implement the remedy and EPA expects to do that here after issuance of the ROD. CERCLA, the Superfund law, does not have provisions covering liability for reductions in property values due to contamination.

CATEGORY: Institutional Controls

SOURCE: 7

PART III: RESPONSE SUMMARY

COMMENT #24

Based on discussions with EPA, EPA will set up procedures by which the Building Department will red-flag properties so that EPA is notified in the event of redevelopment. EPA would determine the required investigation work and EPA's contractor would perform any necessary remediation. It is critical that there be established procedures and timelines for this process to avoid unreasonable and potentially costly delays.

RESPONSE

EPA's pilot program for building permit review has been implemented since 2008 and is working as intended. Upon submittal of an application for a grading or building permit at a parcel within the Del Amo Superfund site, The City of Los Angeles instructs the applicant to contact the Del Amo Environmental Review Team (ERT) via the website: <http://www.delamosuperfund.com>. The ERT includes representatives from EPA, DTSC and the Del Amo Respondents. The ERT may also become aware of onsite development activities through a land-watch monitoring service that tracks planned excavation work and the permits issued for construction activities at the site. Upon notification of planned development activities onsite, the ERT reviews the proposed project, the existing data and historical information for the subject property, to evaluate the potential for future workers or tenants to be exposed to contaminants.

Every effort is made to work closely with the property owner and developer to avoid construction delays. EPA cannot establish timelines ahead of time that would be generic for all reviews, since the timing depends on the scale of the project and conditions of that property. EPA has found that once the landowner/developer and EPA have begun to communicate about a project, an estimated timeline can be developed. It should be noted that, contrary to the commenter's statement, EPA does not plan for its contractor to perform any necessary remediation.

CATEGORY: Institutional Controls

SOURCE: 7



PART III: RESPONSE SUMMARY

COMMENT #25

PCIG is concerned that in the future EPA may no longer be involved, or EPA personnel will not be familiar with the Del Amo site. If so, property owners with restricted properties may have no way to re-develop the property or lift the restrictions. Provide assurances that this will not occur.

RESPONSE

Pursuant to CERCLA, EPA is required to review the implemented remedy for the Site and assess protectiveness every five years. These five-year reviews not only insure continued protection of human health and the environment and effectiveness of the remedy, they also provide for continued public involvement and comment on the effectiveness of the remedy. If EPA determines that an institutional control is no longer needed for a particular property, EPA may amend the ROD or sign an Explanation of Significant Difference. The individual restrictive covenant would have to be released by DTSC. In addition, the restrictive covenants have variance and termination provisions that allow an owner to apply to DTSC for a variance for a specific project or a termination of the restrictions. EPA would be involved in and have input into that process.

CATEGORY: Institutional Controls

SOURCE: 7

## PART III: RESPONSE SUMMARY

COMMENT #26

The Respondents continue to believe that Intrinsic Biodegradation, ICs, and Monitoring are an appropriate remedy for the site as a whole, with the exception of NAPL source area 3 (SA 3), where the addition of SVE is appropriate. This is based on a "weighted average rating" evaluation of remedial alternatives for each property and consideration of recent Federal and State policies and guidance regarding sustainability. No complete exposure pathways currently exist at the site and implementation of Intrinsic Biodegradation, ICs, and Monitoring would be protective of human health and the environment while minimizing adverse effects to onsite businesses.

RESPONSE

EPA believes that Intrinsic Bioremediation, Institutional Controls and Monitoring would be an inappropriate remedy for the site as a whole. Section 121 of CERCLA mandates that a remedy utilize permanent solutions to the maximum extent practicable and satisfy the preference for treatment as a principal element. Intrinsic bioremediation and institutional controls do not utilize permanent solutions or utilize treatment. Furthermore, the NCP (Sec. 300.430(a)(1)(iii)) sets forth that containment will be considered for wastes that pose a relatively low long-term risk, and that institutional controls are most useful as a supplement to engineering controls and should not substitute for more active measures. Intrinsic bioremediation and institutional controls do not constitute containment for those areas at the site that contain relatively low long-term threats. EPA's Proposed Plan states a preference for capping as a containment measure in some of those types of areas. Intrinsic bioremediation does not constitute an active measure, so the commenter is proposing institutional controls alone for most areas of the site. The NCP states that institutional controls should not substitute for more active measures. Finally, the commenter stated that an active measure, soil vapor extraction (SVE), would be appropriate in one location. This ignores all the other locations where principal threat wastes are located. The NCP sets forth that principal threats are to be treated wherever practicable. The locations, constitution, and media where the other principal threat wastes are located make their treatment practicable.

CATEGORY: Remedy Selection

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #27

There continues to be strong evidence that intrinsic biodegradation of VOCs is actively occurring at the site, as evidenced by trends of declining VOC concentrations in many groundwater monitoring wells. Consequently, additional confirmatory sampling will be performed during the design phase wherever an active remedy is selected by EPA. The objectives of confirmatory sampling will be to verify that contaminant concentrations warranting application of the active remedy are still present in the soil and to further define the horizontal and vertical extent of the treatment zones.

RESPONSE

EPA recognizes that hydrocarbons such as benzene may be attenuating due to natural processes. The ROD selects a remedy based on the results of the RI/FS process and the available data. Confirmatory sampling is expected to be performed during the design of the selected remedy to determine the current extent of the treatment zone and the appropriate design of the remedy.

CATEGORY: Remedy selection

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #28

Page 8, What are Building Engineering Controls (BEC)?: We suggest that the definition of BECs that USEPA presents in the ROD be expanded by modifying the definition text in the Proposed Plan to: "BECs are control measures applied at buildings so that contaminated vapors do not build up inside the building and cause health concerns. Examples of the types of BECs that may be applied include, but are not limited to:"

RESPONSE

The proposed change in wording is acceptable. EPA incorporated the proposed wording in Part II, Section 9.2 "Alternative 2..." of the ROD, where defining BECs.

CATEGORY: Building engineering controls

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #29

"Page 8, What are Building Engineering Controls(BEC)?: The types of BECs currently mentioned and described in the Proposed Plan are subslab venting, building depressurization, and normal ventilation. We suggest that in the ROD the following two types of BECs be included in the explanation:

Passive Vapor Barrier

Barriers made of plastic sheeting or cured-in-place materials are placed under the building slab to prevent vapor intrusion into the building.

Floor Sealing

Floor sealants and sealing filters are applied to existing floor slabs to reduce vapor diffusion through the slab and to seal cracks, gaps, and openings in the floor."

RESPONSE

The proposed additional types of BECs are valid technologies or approaches for mitigating potential vapor intrusion. It should be noted that passive vapor barriers are valid for new construction only and was not mentioned in the FS. Since this ROD applies BECs only to existing buildings, passive vapor barriers were not mentioned in the ROD. Floor sealing is applicable to existing structures and is briefly mentioned in the FS but is not included in the discussion of the retained technologies in the FS. Regardless, passive vapor barriers are mitigation measures that could be implemented at Del Amo and EPA adding their descriptions to the ROD text in Part II, Section 9.2 "Alternative 2..."

CATEGORY: Building engineering controls

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #30

Page 9, what is In-Situ Chemical Oxidation?: The second and third sentences don't accurately describe the ISCO process. We would suggest modifying these sentences in the ROD as follows: "Oxidant is pumped into the saturated zone through the wells. The contaminant is oxidized in place, and an SVE system is utilized to remove the vapors created through the oxidation process along with other vadose zone vapors. In addition, residual oxygen from the process promotes natural attenuation."

RESPONSE

Both statements are valid descriptions of the process. EPA described the concepts from the suggested wording in the ROD description of ISCO in Part II, Section 9.4 "Alternative 4..." and Section 12.2 "Description of Selected Remedy."

CATEGORY: isco

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #31

Page 12, Alternative 4, Cost estimates: The “Estimated Construction Time Frame” is listed as 3 to 4 years of operation. However, this is inconsistent with the capital and O&M costs presented in the FS. For Alternative 4 (ISCO+SVE), the timeframe and other implementation details will be determined during remedial design. In the FS, ISCO components of 2-year, 4-year and 8-year timeframes were discussed. The Respondents suggest inclusion of the 2-year ISCO option as well in the ROD, because pilot testing could show this to be appropriate and property owners may deem remedy impacts to be lower.

RESPONSE

The Proposed Plan correctly indicates 3-4 years for operations, but also provides costs for years 5-8 of operations. The cost table will be corrected in the ROD. Timeframes for operations are as follows: the FS discusses a 2 year ISCO option with 4 years of SVE. The FS addenda discusses an option 5A1, an 8 year option that includes fewer injection wells and peroxide injection over a longer period of time, and 5A2, injection of oxidant by means of direct push rather than injection wells over a 4 year period. The ROD recognizes the variability in approaches and states that the exact approach and associated timeframe will be selected during remedial design.

CATEGORY: costs

SOURCE: 8

## PART III: RESPONSE SUMMARY

COMMENT #32

"Page 19, Table 6: The information in Table 6 indicates that USEPA's Preferred Alternative includes SVE for properties where VOC-contaminated outdoor shallow soil is present, including properties 6, 11 and 23. While NAPL source areas with proposed ISCO and SVE remedies are present in the vicinity of the each of these areas, stand-alone SVE systems (e.g., wells, blowers, and treatment systems), that would not otherwise be installed, would be required to address VOCs in the shallow soil. It is the Respondents' position that Capping, ICs and Monitoring at these areas would be protective of human health while being more cost effective and less intrusive than SVE. Additional SVE in these areas would result in significant increases in complexity, cost, and intrusion on the property owners without commensurate risk reduction. Risks associated with each of these three properties are within USEPA's discretionary risk range ( $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ) and are summarized below:

Property 6 (Commercial Worker):

Outdoor Soil:  $3 \times 10^{-6}$  (Cancer Risk) <1 (Hazard Index)

Indoor Air:  $4 \times 10^{-6}$  (Cancer Risk) <1 (Hazard Index)

Property 11 (Commercial Worker):

Outdoor Soil:  $2 \times 10^{-5}$  (Cancer Risk) <1 (Hazard Index)

Indoor Air:  $7 \times 10^{-6}$  (Cancer Risk) <1 (Hazard Index)

Property 23 (Commercial Worker):

Outdoor Soil:  $1 \times 10^{-5}$  (Cancer Risk) <1 (Hazard Index)

Indoor Air:  $2 \times 10^{-5}$  (Cancer Risk) <1 (Hazard Index)"

RESPONSE

The risk associated with shallow soil contamination in these areas is actionable and EPA has selected an active remedy. Because the surface pathway and NAPL pathway evaluations were performed and costed separately, the FS includes separate SVE systems for treatment of the shallow and deep soil at the areas identified in the comment (EAPCs 6, 11, and 23). Generally the same contaminants (primarily benzene) are being addressed in the shallow and deep vadose zone, so in most cases the shallow and deep vadose zone remedies can be combined. This is the case for the shallow and deep benzene-impacted areas on the properties at EAPCs 6, 11, and 23. Additional design considerations, such as blower size, pipe diameter, and length of trenching/piping will be necessary to combine the treatment systems. The additional cost of increased design may offset the cost savings of having a single SVE system. SVE system locations proposed in the FS could also be adjusted to accommodate multiple treatment areas.

Confirmation sampling during Remedial Design will be performed in areas selected for this active remedy. Confirmation sample results will be used to determine where, not whether, a remedy is needed. An assessment of the viability of designing one SVE system to treat both the shallow and deep vadose zone will be performed at that time.

At EAPC 6, UVOST data collected in 2009 suggest that the eastern extent of the NAPL associated with SA11 may occur at over 150 feet from the building, and more than 300 feet from the SVE system location proposed in Appendix E of the FS. It is expected that the SVE wells required to treat the soil west of the building can be tied into the SVE system installed to remediate the NAPL-impacted soil. For reference, at the Del Amo Waste Pits, Extraction Well 20A is piped a distance of over 400 feet to the SVE



PART III: RESPONSE SUMMARY

system. The cost of trenching and other design elements may offset the cost savings from using a single SVE system.

EAPC 11 is situated adjacent to the north of NAPL SA12. Results of the 2009 UVOST screening at SA12 suggest that contamination associated with SA12 extends onto the southern portion of the EAPC 11 property. Therefore, the SVE system associated with the NAPL remedy will be able to tie in any additional shallow SVE wells needed to mitigate shallow VOCs at the southeast corner of EAPC 11.

There are multiple areas requiring SVE at EAPC 23, on the northwest, northeast, east, and southwest sides of the building. The impacted shallow soil in the north and east areas are very close to SA3 and SA6, respectively, and therefore could be tied into the NAPL/deep soil remedy. The PCE-impacted area at the southwest corner of the building at EAPC 23 is within approximately 150 feet of the proposed SA6 SVE system location, but would most likely require a separate system because the thermal or catalytic oxidizer proposed for treating the benzene would require a scrubber to treat the PCE, which would raise the cost dramatically. Two separate systems are costed in Appendix E of the FS.

CATEGORY: Remedy selection

SOURCE: 8

## PART III: RESPONSE SUMMARY

COMMENT #33

Page 19, Table 6, and page 20, text in first paragraph under Shallow Soil Components – Outdoor and Beneath Buildings: Though it is not specified in the Proposed Plan, the Respondents infer that USEPA’s Preferred Alternative includes Building Engineering Controls (BECs) at property 16, and SVE beneath the building at property 23. Further, the Respondents understand that USEPA’s decision to include these remedial responses in the Preferred Alternative at these two properties is based on concerns associated with chlorinated solvents in shallow soil, specifically TCE and PCE, beneath these buildings. The extensive site history investigation of the former rubber plant that was performed during the Remedial Investigation revealed no evidence that TCE and PCE were ever used at the site during the operational life of the rubber plant complex. Because there is no evidence that these compounds were used at the former rubber plant that was the subject of the RI/FS investigation, the Respondents maintain that they should not be responsible for designing, constructing and operating these components of USEPA’s Preferred Alternative.

RESPONSE

EPA’s Proposed Plan specifies that the preferred alternative includes building Engineering Controls, as stated on page 13, second paragraph, “One building, on the property in Area #16, would have engineering controls, in the same manner as Alternative 3, to ensure vapors do not accumulate within the building.” The Proposed Plan also specifies that the preferred alternative includes SVE beneath the building in Area 23, as stated on page 13, third paragraph, “One building would have soil vapor extraction implemented in the soil beneath the buildings... The building would be in Area #23.”

The Record of Decision selects the remedy for the site. The Record of Decision does not assign responsibility for designing, constructing and operating the remedial actions, in whole or in part.

CATEGORY: Remedy Selection

SOURCE: 8

## PART III: RESPONSE SUMMARY

COMMENT #34

Page 19 Table 6, and page 20 text in second paragraph under NAPL/Groundwater Contamination Source Areas Components: Active remedial measures proposed for NAPL SA6 are limited to SVE in the vadose zone. Previous ROST and soil boring analytical data, as well as recent UVOST work in this area suggest the majority of the vadose zone contaminant mass is in the shallow subsurface (i.e., less than 15 feet below ground surface) and a complete exposure pathway is not present. Confirmatory sampling with chemical analysis should be performed in this area during the remedial design phase to assess whether elevated VOC concentrations are present in these shallow soils that would warrant a remedial response. If the results of the additional assessment confirm that elevated VOC concentrations in the vadose zone are present, but are limited primarily to the shallow subsurface (<15 feet below ground surface), then the Respondents believe that any vadose zone SVE system should be designed to target only this shallow zone. However, if the results of the additional assessment show that contaminant concentrations have declined below levels that warrant an active remedial response, then an alternative remedial measure (such as Capping with ICs and Monitoring) should be considered for implementation.

RESPONSE

Confirmation sampling during Remedial Design will be performed in areas selected for an active remedy. Confirmation sample results will be used to determine where, not whether, a remedy is needed. Previous ROST data at SA6 indicate contamination at a depth of approximately 35 feet in CPL0067 and at 15 feet bgs in CPL0065. UVOST data collected in 2009 do not show strong responses, but there appear to be indications of contamination at depths below 15 feet, for example in CPL0114. The only previous soil boring (SBL0125) was advanced to 12.5 feet bgs and indicated shallow contamination. Soil matrix samples have not been collected deeper than 12.5 feet. Deep soil gas samples at 59 and 48 feet bgs contained significant concentrations of benzene; however those depths are believed to be below the current water table. The overall body of previous sampling data does not indicate a lack of contamination below 15 feet bgs in the vicinity of NAPL SA6. Benzene in the SA6 area has contributed to overall EAPC risk levels considered actionable by EPA. EPA agrees that the extent of shallow and deep vadose zone impacts should be confirmed as part of the Remedial Design sampling activities and results used to refine the treatment zone.

CATEGORY: Remedy selection

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #35

Page 19 Table 6: Properties numbered 29 and 34 are listed in the table, apparently in error, with Institutional Control layers 1 through 5 being applied as part of USEPA's preferred alternative. As indicated on Figures 3 and 4 and elsewhere in the Proposed Plan, the Respondents understand that EPA has decided to defer remedial decisions for both of these properties to the Montrose Superfund Project. Consequently, remedial decisions for properties 29 and 34 should not be included in USEPA's Record of Decision for the Del Amo Soil and NAPL Operable Unit.

RESPONSE

Properties 29 and 34 will not be included in this Del Amo ROD. They will be addressed at a later date in a subsequent decision document.

CATEGORY: Remedy selection

SOURCE: 8

PART III: RESPONSE SUMMARY

COMMENT #36

Throughout document: Numbered areas are referred to in the Proposed Plan, sometimes referring to one or more properties (e.g. "Area 6"), but other times referring to one or more groundwater contamination source areas (e.g. "Source Area 6"). This different usage may confuse the reader. The Respondents therefore suggest that in the ROD, USEPA refer to "properties" or "property" as an alternative to "area" wherever the reference is to a numbered property rather than a NAPL source area, to more clearly distinguish them.

RESPONSE

EPA acknowledges that there is more than one way to describe a concept. In the Proposed Plan, EPA designated the shallow soil contamination areas as "Area 1, Area 2" etc., and the NAPL source areas as "Source Area 1, Source Area 2" etc. The commenter suggests designating the shallow soil contamination areas as "Property 1, Property 2" etc. EPA prefers to use the term "Area" because it carries the connotation that EPA wants to communicate (an area of contamination within the larger Superfund Site). The term "property" carries the connotation of current ownership, which is not what we need to convey. The creation of the property boundaries in existence today occurred after the former rubber plant was dismantled; today's property boundaries have nothing to do with the former rubber plant. EPA prefers to present the areas of contamination as areas within the larger Superfund Site, without regard to current property boundaries.

The commenter suggested that the wording used was confusing, and the suggested wording would be clearer. However, what is clearer for one reader could be more confusing for another.

CATEGORY: Readability

SOURCE: 8

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**APPENDIX B**  
**STATEMENT OF WORK (“SOW”)**

**APPENDIX B**

**STATEMENT OF WORK**

**FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION**

**Soil and NAPL Operable Unit (OU 1)**

**DEL AMO FACILITY SUPERFUND SITE**

**City of Los Angeles, County of Los Angeles, State of California**

**EPA Region 9**

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I. PURPOSE OF THE SOW

This Statement of Work (SOW) sets forth the tasks and requirements to be undertaken by the Settling Defendant (SD), in compliance with the Consent Decree (CD), for implementing the remedial design (RD) and remedial action (RA) for Operable Unit 1 (OU1) at the Del Amo Facility Superfund Site (Site) as set forth in the OU1 Record of Decision (ROD).

II. DEFINITIONS

Unless otherwise expressly provided in the SOW, the terms used in the SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the CD, shall have the meanings assigned to them in CERCLA, in such regulations, or in the CD. Whenever terms listed below are used in the SOW or in any appendix attached hereto, the following definitions shall apply:

“Paragraph” shall mean a paragraph of the SOW, unless otherwise stated.

“RPM” shall mean the EPA remedial project manager, or other representative designated by EPA.

“Section” shall mean a Section of the SOW, unless otherwise stated.

“Approval by EPA” and “as determined by EPA” shall mean that EPA has also notified DTSC and given them the opportunity to comment.

III. DESCRIPTION OF THE REMEDIAL ACTION AND REQUIREMENTS

The Work to be performed under this SOW has been developed based on the selected remedy for the Del Amo Superfund Site OU1. A full description of the selected remedy is presented in the ROD (*“Record of Decision, Del Amo Facility Superfund Site, Soil and NAPL Operable Unit, Los Angeles, CA”* September 30, 2011), as supplemented by the Memo to File, dated July 26, 2013. The Work associated with the selected remedy is outlined below and described in detail thereafter. This Work shall be implemented as part of this SOW.

The Performance Standards include the ARARs, clean-up goals, clean-up standards, standards of control, quality assurance/quality control criteria and other substantive requirements, criteria or limitations set forth below, as based on the ROD, and/or contained in any approved deliverable.

The ROD states (p. 137): “If new analytical data for one or more of the identified areas demonstrate that the described clean-up goal has been met prior to implementation of the remedy through natural attenuation or other mechanisms, the intent of this ROD will have been met and active remediation will not be required.”

The primary components of the Work are:

- A. Institutional Controls (ICs)
  - 1. Informational Outreach
  - 2. Building Permit Review
  - 3. General Plan Footnote
  - 4. Restrictive Covenants
  - 5. Groundwater Covenants
- B. Capping for VOC and Non-VOC impacted Shallow Outdoor Soil
- C. Building Engineering Controls (BECs) for VOC-Impacted Shallow Soil Under a Building
- D. SVE for VOC-impacted Outdoor Shallow Soil
- E. SVE for VOC-impacted Soil Under a Building
- F. SVE for Vadose Zone Soil in a NAPL-Impacted Groundwater Contamination Source Area
- G. ISCO and SVE for Deep Soil and Groundwater in NAPL-impacted Groundwater Contamination Source Areas
- H. Excavation, BECs, Capping, and/or SVE for Areas of Site-Related Contamination Encountered During Future Redevelopment or Construction

A detailed description of the Work that SD is required to implement pursuant to the CD and this SOW is as follows:

- A. Institutional Controls - The Institutional Controls (ICs) to be implemented during RA consist of the following five (5) components of work and will be further defined in the Institutional Control Implementation and Assurance Plan (ICIAP) that will be developed as part of RD activities: informational outreach, building permit review,

General Plan footnote, restrictive covenants, and groundwater covenants. Performance standards for these components are described below.

1. IC Layer 1 - Informational Outreach includes the use of informative mailings, websites, publicly accessible databases and any other venue as determined by EPA that can provide information to property users. The outreach will be accomplished during implementation of RD and RA.
  - a) Informational outreach shall be applied to all properties in OU1. The targeted audience includes owners, tenants, prospective owners and tenants, developers and other entities supporting them.
  - b) SD shall make environmental information about the properties available to the targeted audience, including data from the remedial investigation and information from the Baseline Risk Assessment and ROD and any other relevant information, as determined by EPA, and shall maintain such information in a database publicly accessible through the internet.
  - c) The ICIAP, required under Section V(D), shall include a plan and schedule for preparing the outreach material to be used in the outreach tools (mailings, websites, publicly accessible databases, and any other venue proposed by SD or directed by EPA) and implementing the outreach tools. The ICIAP is subject to review and approval by EPA pursuant to Section XI of the CD.
  - d) SD shall, in the ICIAP, specify a frequency for sending the mailings and updating ownership and tenant contact information.
  - e) SD shall, in the ICIAP, describe the website infrastructure, including, but not limited to, host server – in house or outsource, utilization of, integration with, or links to existing site websites, as well as a plan and schedule for website design appearance and any other relevant descriptive feature.
  - f) SD shall, in the ICIAP, specify the publicly accessible databases that will be used to house site information, and describe the process required to place OU1 property information in those databases.
  - g) SD shall, in the ICIAP, specify any other outreach venue it proposes to use, and submit a plan and schedule for utilizing those tools.
  - h) SD shall implement, monitor and update IC Layer 1, as defined in the ICIAP, in perpetuity. SD may propose, at any time during operation and maintenance (O&M), for EPA approval, to alter or remove the IC Layer 1 activities. SD shall, in the ICIAP, specify the methods, frequency,

and duration that will be used to monitor the tools implemented in this component of work. The frequency shall be annually, unless SD proposes and EPA approves otherwise.

2. IC Layer 2 - Building Permit Review

a) SD shall continue implementing the Building Permit Review process at all OU1 properties as defined in the June 27, 2007 Work Plan Supplement to the AOC, Docket No. 92-13 (Work Plan Supplement) during RD and RA. SD shall include in the ICIAP all the steps required to implement the Permit Review IC, which shall include at a minimum the steps included in the Work Plan Supplement. SD shall continue implementing its role in the Del Amo Environmental Review Team (ERT) as specified in the Work Plan Supplement. This includes conducting initial meetings/teleconferences with applicants upon being notified or otherwise becoming aware of a planned project; reviewing applicants' project and existing environmental information; preparing a Screening Evaluation Summary Report (SESR, as defined in the Work Plan Supplement) including, among other things, a recommendation for follow-up action (if any); conducting any follow-up actions; and submitting results from any follow-up actions. The Building Permit Review IC, including the Pre-screening step and the Supplemental Environmental Review Process and the SESR, are further defined in the Work Plan Supplement.

b) SD shall monitor underground service alerts for notifications of intent to perform subsurface work at the Site. Upon notification SD shall contact the applicant and conduct the pre-screening step of the Building Permit Review IC.

c) SD shall continue to perform all building permit review IC actions in perpetuity. SD may propose, at any time during O&M for that parcel, for EPA approval, to alter or remove the IC Layer 2 activities. SD shall, in the ICIAP, specify the methods, frequency, and duration that will be used to monitor the tools implemented in this component of work. The frequency shall be annually, unless SD proposes and EPA approves otherwise.

3. IC Layer 3 - General Plan Footnote - SD shall work with local government entities to prepare a General Plan footnote (the footnote) for 26 properties in OU1, specifically Areas 2, 4-17, 19, 20, 22-24, 28, 30, 32, 33, 35, and 36, for approval and implementation by local government entities during RA. The footnote will state that the land is within the Del Amo Superfund Site and is not appropriate for residential use.

a) SD shall, in the ICIAP, submit a plan and schedule for preparing the General Plan footnote and pursuing the necessary process to add it to the Los Angeles General Plan. This will entail working with the City of LA Planning Department, Planning Commission, and City Council to amend the General Plan.

b) The plan in the ICIAP must include, but not be limited to, submission of a draft General Plan footnote for EPA review and approval prior to submission to the Planning Department or Commission.

c) In the implementation of the plan in the ICIAP, SD shall directly contact and work with the Planning Department, Planning Commission and City Council. This work shall include, at a minimum, preparing and submitting any required documents and applications pursuant to the City's standard processes, including paying any associated fees, as well as providing any additional information and other assistance as necessary. EPA will provide direct support and involvement with the City as necessary, but primary responsibility shall lie with the SD.

d) If the City approves and implements the footnote, SD shall monitor IC Layer 3 in perpetuity. SD may propose, at any time during O&M, for EPA approval, to alter or remove the IC Layer 3. SD shall, in the ICIAP, present a plan and schedule for periodically monitoring the General Plan after implementation of the General Plan footnote to verify that the footnote remains in place and that zoning is not changed to residential or any other sensitive use (e.g. hospital or daycare) for any parcel within the 26 parcels noted above. The frequency of such monitoring shall be annually, unless SD proposes and EPA approves otherwise. If SD learns that any of the parcels included within these 26 properties are proposed to have their use changed to residential or any other sensitive use, SD shall notify EPA and DTSC of such proposal within 3 business days of acquiring such knowledge.

4. IC Layer 4 - Restrictive Covenants shall be implemented on Areas 2, 4-17, 19, 20, 22-24, 28, 30, 32, 33, 35, and 36. The restrictive covenants should be in substantially the same form as Appendix D of the CD and shall meet the requirements of the ROD.

a) SD shall, in the ICIAP, submit a plan and schedule to secure filing of the covenants during RA, including preparing the draft restrictive covenants, conducting a title search, preparing current title insurance commitments (if necessary), obtaining release or subordination of prior liens and encumbrances (if necessary, pursuant to Section 4.d), negotiating covenants with property owners, arranging for execution of

the covenants, updating the title searches, recording the covenants, and providing the final documentation to EPA. SD shall implement the plan.

b) The draft restrictive covenants shall be submitted to EPA and DTSC for review and approval.

c) SD shall monitor IC Layer 4 in perpetuity. SD may propose, at any time during RA, for EPA approval, to alter or remove the IC Layer 4 activities. Note that provisions of the covenant will dictate further requirements for its alteration or removal. SD shall, in the ICIAP, specify the methods, frequency, and duration that will be used to monitor the restrictive covenants implemented in this component of work. The frequency shall be annually, unless SD proposes and EPA approves otherwise. SD

d) For each property subject to this section, SD shall review all prior liens and encumbrances shown on the title search and evaluate their impact on remedy implementation and enforcement of the restrictive covenants. SD shall propose release or subordination of those liens and encumbrances that may impact remedy implementation or enforcement of the covenants, or propose notice to the holders of such liens and encumbrances. Upon EPA approval of SD's review and proposals, SD shall obtain such releases or subordination agreements, or issue such notices.

5. IC Layer 5 - Groundwater Covenants shall be implemented on Areas 4, 5, 6, 8, 9, 11, 15, 16, 17, 19, 20, 22, 23, 24, 28, 32, 33, and 35. This covenant shall meet the requirements of the ROD, including prohibiting drilling into and use of groundwater without prior approval of EPA and DTSC.

a) SD shall, in the ICIAP, submit a plan and schedule to secure filing of the groundwater covenants during RA, including preparing the draft covenants, negotiating covenants with groundwater rights owners, arranging for execution of the covenants, recording the covenants if applicable, and providing the final documentation to EPA.

b) The draft groundwater covenants shall be submitted to EPA and DTSC for review and approval.

c) SD shall monitor IC Layer 5 in perpetuity. SD may propose, at any time during RA, for EPA approval, to alter or remove the IC Layer 5 activities. Note that provisions of the covenant will dictate further requirements for its alteration or removal. SD shall, in the ICIAP, specify the methods, frequency, and duration that will be used to monitor the

covenants implemented in this component of work. The frequency shall be annually, unless SD proposes and EPA approves otherwise.

**B. Capping for VOC- and Non-VOC-impacted Shallow Outdoor Soil**

Caps currently exist at each of the four areas identified for capping in the form of asphalt or concrete covered streets, parking lots, or storage areas. These existing caps will be evaluated during remedial design to determine whether they are sufficient to meet the remedial objective. Capping does not remove or treat soil, so there is no quantitative soil clean-up level.

a) SD shall design and construct (if not already present with acceptable integrity) caps on areas of properties 2, 16, 28, and 35 where non-VOCs, and in some cases VOCs, are present above the action level, as described in the ROD.

b) SD shall assess if existing data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data/risk evaluation activities to determine the capping footprints (with EPA approval). SD will then perform an initial visual inspection of the pre-remediation surface of each capping location and propose whether the existing surface meets the capping requirement (with criteria defined in the Pre-Design Investigation Work Plan). If cracks, holes, or other forms of disrepair are observed that would not allow the existing surface to meet the capping requirements, SD shall submit a design plan for and perform repairs, enhancements, or replacements of existing surfaces (e.g., slurry sealing, repaving, etc.).

SD shall propose, in the Performance Monitoring and Evaluation Plan (PMEP), how the Performance Standards will be measured, and propose a schedule and protocol for monitoring and inspecting the caps (which may include proposing discontinuation of a cap at some point in the future). SD shall, in the draft O&M Plan described in Section V(l), propose a schedule and protocol for repairing and replacing the caps. SD shall perform the periodic monitoring, inspections, maintenance, repairs, and replacements.

**C. Building Engineering Controls (BECs) for VOC-Impacted Shallow Soil under a Building**

a) During RD, SD shall assess if existing site data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data/risk evaluation activities including, but not limited to, indoor air



and outdoor air background concentrations of COCs in accordance with the ROD.

b) If evaluation of the data indicates that COC concentrations attributable to sub-slab VOC impacted shallow soil clearly exceed the action levels identified in the ROD, SD shall implement BECs. In the Pre-Design Investigation Report, SD shall propose locations for the BEC components.

c) If the action levels identified in the ROD are not clearly exceeded, SD shall prepare and submit a plan (included as part of the Pre-Design Investigation Work Plan) to perform periodic monitoring to ascertain whether COC action levels are exceeded. Upon completion of periodic monitoring, if ROD action levels have not been clearly exceeded, BECs will not be required and a Treatment Area-Specific Remedial Action Report will be prepared. SD shall propose, in the PMEP, a schedule, duration, and protocol for monitoring.

d) If EPA determines that building engineering controls are necessary, SD shall first modify the existing building ventilation system. If that measure alone is insufficient to achieve the clean-up goals, then SD shall seal the floors as well. These measures shall be accompanied by periodic monitoring for the same parameters as the periodic monitoring. SD shall propose, in the PMEP, the schedule, duration, and protocol for monitoring.

e) SD shall implement, maintain, and monitor, as needed, the BECs pursuant to the EPA-approved BEC design plan and the PMEP. If the ventilation modifications and/or floor sealing are insufficient to achieve indoor air clean-up goals, SD shall implement sub-slab venting. Sub-slab venting shall include evaluation of the need to treat and extract vapors to achieve air emission ARARs. SD shall treat and extract vapors as necessary to achieve ARARs. Sub-slab venting shall include periodic monitoring to allow for assessment of achieving the clean-up goals identified in the ROD. SD shall propose, in the PMEP, the schedule, duration, and protocol for monitoring these parameters.

D. SVE for VOC-impacted Outdoor Shallow Soil

a) SD shall design, construct, and operate a soil vapor extraction (SVE) system at properties numbered 6, 11, and 23 until the clean-up goals presented in Table 12-16.1 of the ROD are achieved, if they are not already achieved (based on assessment defined in paragraph b). The system shall address areas where volatile organic compounds (VOCs) are present above action levels specified in Section 12.2.4 of the ROD.

b) SD shall assess if existing site data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data/risk evaluation activities to determine the need for and extent of the outdoor shallow soil requiring remediation, the soil characteristics, or any other parameter needed for design purposes, as approved by EPA. SD shall conduct the additional sampling in accordance with EPA-approved sampling plans. SD shall conduct the testing described above in accordance with Section V(C) below. In the Pre-Design Investigation Report, SD shall propose the extent of the treatment system.

c) If data gathered during the Pre-Design Investigation (which at least covers the area that previously exceeded action levels) show that levels of contamination no longer exceed action levels, no action will be needed for the area. If data gathered during the Pre-Design Investigation exceed action levels, SD shall prepare a Pilot Study Work Plan and conduct a pilot study as part of the preliminary stage of the RD. SD shall conduct the study described above in accordance with Section V(C) below.

d) SD shall, during the preliminary stage of the RD, evaluate a range of options for the vapor treatment component of the system and present this evaluation to EPA for review and approval. The range of options shall include, at a minimum, thermal oxidizers, vapor phase carbon adsorbers, condensers, and internal combustion engines. SD shall implement the vapor treatment technology approved by EPA during RD. EPA shall consider factors including, but not limited to, cost, effectiveness, implementability, and public acceptance.

e) SD shall include in the RD and RA reasonable efforts to minimize impacts on the property owners and tenants at these properties. Such measures shall include such things as placing piping below grade and siting aboveground treatment equipment in a location convenient for the commercial occupant, where practicable.

f) SD shall propose, in the PMEP described in Section VI(E), the methods required for monitoring system performance, including process monitoring, progress of the remediation, and the attainment of the clean-up goal. The decision to permanently shut down the SVE system will be based on achieving the clean-up goals in Section 12.4.2(4) of the ROD (as measured according to the PMEP).

g) SD shall evaluate use of flush-mounted, traffic-rated well boxes to minimize impedance to vehicular traffic at the operating facilities, where

appropriate. Well boxes shall also be secured to prevent unauthorized access.

E. SVE for VOC-impacted Soil under a Building

a) SD shall design, construct, and operate an SVE system to address VOCs beneath the south end of the building on property number 23 (19899 Pacific Gateway Drive). The system shall address areas where VOCs are present above action levels specified in Section 12.2.5 of the ROD (based on assessment defined in paragraph b).

b) SD shall assess if existing data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data/risk evaluation activities to determine the extent of shallow soil under the building, if any, requiring remediation, and the soil characteristics, or any other parameter needed for design purposes. In the Pre-Design Investigation Report, SD shall evaluate sub-slab sources and identify the extent of the treatment system, subject to EPA approval. SD shall conduct testing described above in accordance with Section V(C) below.

c) If data gathered during the Pre-Design Investigation (which at least covers the area that previously exceeded action levels) show that levels of contamination no longer exceed action levels, no action will be needed for the area. If data gathered during the Pre-Design Investigation exceed action levels, SD shall prepare a Pilot Study Work Plan for EPA approval and conduct a pilot study as part of the preliminary stage of the RD.

SD shall conduct the testing described above in accordance with Section V(C) below.

d) SD shall implement and operate the SVE system until the clean-up goals (as measured according to the PMEP) in Section 12.4.2(5) of the ROD are met.

e) SD shall, during the preliminary stage of the RD, evaluate a range of options for the vapor treatment component of the system and present this evaluation to EPA for review and approval. The range of options shall include, at a minimum, thermal oxidizers, vapor phase carbon adsorbers, condensers, and internal combustion engines. SD shall implement the vapor treatment technology approved by EPA during RD. EPA shall consider factors including, but not limited to, cost, effectiveness, implementability, and public acceptance.

f) SD shall design sub-slab probes in a manner to minimize damage to the interior of the structure. If damage occurs as a result of SD's work, SD shall be responsible for the repairs and associated costs.

g) SD shall include in the RD and RA reasonable efforts to minimize the impact on the property owners and tenants at this property. Such measures shall include such things as placing piping below grade and siting above ground treatment equipment in a location convenient for the commercial occupant, where practicable.

h) SD shall propose, in the PMEP described in Section VI(E), the methods required for monitoring system performance including process monitoring, progress of the remediation, and the attainment of the clean-up goal.

i) The SD shall evaluate use of flush-mounted, traffic-rated well boxes to minimize impedance to vehicular traffic at the operating facilities, and implement where appropriate. Well boxes shall also be secured to prevent unauthorized access.

F. SVE for Deep Vadose Zone Soil in a NAPL-Impacted Groundwater Contamination Source Area

a) SD shall design, construct, and operate an SVE system in SA-6 located on property number 23 until the clean-up goals specified in ROD Section 12.4.2.6 are achieved (based on assessment methods described in the PMEP).

b) SD shall assess if existing data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data evaluation activities to help define the design basis and establish the areal and vertical extent of NAPL-impacted soil requiring remediation, subject to EPA approval. SD shall conduct the additional sampling in accordance with the EPA-approved sampling plans. SD shall conduct the testing described above in accordance with Section V(C) below and present the findings, design basis, and extent of remediation in the Pre-Design Investigation Report.

c) SD shall prepare a Pilot Study Work Plan for EPA approval, and conduct a pilot study as part of the preliminary stage of RD. SD shall conduct the study described above in accordance with Section V(C) below.

d) SD shall, during the preliminary stage of the RD, evaluate a range of options for the vapor treatment component of the system and present

this evaluation to EPA for review and approval. The range of options shall include, at a minimum, thermal oxidizers, vapor phase carbon adsorbers, condensers, and internal combustion engines. SD shall implement the vapor treatment technology approved by EPA during RD. EPA shall consider factors including, but not limited to, cost, effectiveness, implementability, and public acceptance.

e) SD shall include in the RD and RA reasonable efforts to minimize the impact on the property owners and tenants at this property. Such measures shall include placing piping below grade and siting aboveground treatment equipment in a location convenient for the commercial occupant, where practicable.

f) SD shall propose, in the PMEP described in Section VI(E), the methods required for monitoring system performance including process monitoring, progress of the remediation, and the attainment of the clean-up goal.

g) SD shall evaluate use of flush-mounted, traffic-rated well boxes to minimize impedance to vehicular traffic at the operating facilities, where appropriate. Well boxes shall also be secured to prevent unauthorized access.

G. ISCO and SVE for Deep Soil and Groundwater in NAPL-impacted Groundwater Contamination Source Areas

a) SD shall design, construct, and operate an in-situ chemical oxidation (ISCO) and SVE system at NAPL Source Areas SA-3, SA-11, and SA-12 until the clean-up goals specified in ROD Sections 12.4.2.6 and 12.4.2.7 are achieved.

b) SD shall assess if existing data is sufficient for RD needs, subject to EPA approval. If not, SD shall include such sampling in the Pre-Design Investigation Work Plan and conduct sample collection and data evaluation activities to help refine the extent of VOC NAPL contamination requiring remediation and complete the RD for this element of work. SD shall conduct the additional sampling in accordance with the EPA-approved sampling plans. SD shall conduct the testing described above in accordance with Section V(C) below, and present the results, design basis, oxidant, and extent of remediation in the Pre-Design Investigation Report.

c) SD shall prepare Bench/Pilot Study Work Plan(s) and conduct bench/pilot study(ies) as part of the preliminary stage of RD. The results of the Bench Study Report(s) shall help define the parameters to be used

in the pilot study(ies) and remedial design(s), including recommending the most appropriate oxidant. SD shall conduct the study(ies) described above in accordance with Section V(C) below.

d) SD shall, during the preliminary stage of the RD, evaluate a range of options for the vapor treatment component of the system and present this evaluation to EPA for review and approval. The range of options shall include, at a minimum, thermal oxidizers, vapor phase carbon adsorbers, condensers, and internal combustion engines. SD shall implement the vapor treatment technology approved by EPA during RD. EPA shall consider factors including, but not limited to, cost, effectiveness, implementability, and public acceptance.

e) SD shall propose, in the PMEP described in Section VI(E), the methods required for monitoring system performance and achievements, including process monitoring, progress of the remediation, plume stability, compliance with ARARs, and the attainment of the clean-up goal.

f) After SD performs the pilot study(ies), SD shall expand the system into a phased implementation of the RA, subject to EPA approval. The results of the previous phases will guide the subsequent phases.

g) SD shall include in the RD and RA reasonable efforts to minimize the impact on the property owners and tenants at this property, including placing piping below grade and siting the aboveground treatment equipment in a location convenient for the commercial occupant, where practicable.

h) SD shall evaluate use of flush-mounted, traffic-rated well boxes to minimize impedance to vehicular traffic at the operating facilities, where appropriate. Well boxes shall also be secured to prevent unauthorized access.

H. Excavation, BECs, Capping, and/or SVE for Future Areas of Contamination Encountered During Redevelopment or Construction

a) If, during the course of construction or redevelopment of properties within OU1, additional contamination consistent with the former rubber plant and related operations is found in the shallow soil (less than 15 feet bgs) exceeding action levels identified in the ROD, SD shall implement remedial action, focused on the protection of both the construction workers and a commercial-use scenario, as described below.

b) The method for addressing such contamination shall consist of excavation and off-site disposal, with the following exceptions:

- (1) If VOC contamination exceeding action levels underlies a structure such that excavation is impractical, as determined by EPA, then SD shall implement BECs in the same manner as in Section II.C.
- (2) If excavation is impractical because of interference with structures or infrastructure, as determined by EPA, then SD shall implement SVE (for VOCs) and/or capping (for non-VOCs) in the same manner as in Section II.B. or II.E., respectively.
- c) SD shall create a generic excavation work plan pursuant to Section VI, Part A(3) of this SOW. In the event that remediation will alternatively be implemented through capping, BECs, or SVE, SD will prepare a work plan for review and approval by EPA prior to implementation.
- d) Upon attaining clean-up goals in each remedial action area, SD shall prepare technical memoranda pursuant to Section VI Part A(3), to document the action.
- e) If COCs are left in place above a level that would not allow for unrestricted use, and a restrictive covenant is not already in place, then SD shall make best efforts to negotiate and implement a restrictive covenant with property owner(s) at that location.

#### IV. GENERAL REQUIREMENTS

- A. All deliverables required pursuant to this SOW are subject to review and approval by EPA pursuant to Section XI of the CD.
- B. Progress Reports. SD shall prepare progress reports, as specified in paragraph 28 of the Consent Decree, and submit them to EPA and the State. The reporting requirements may be modified in the future, with EPA approval, as specified in paragraph 28 of the Consent Decree.
- C. SD shall install barriers to prevent unauthorized access to any active remediation work area, during and after work hours.
- D. Best Efforts Green Remediation - SD shall include reasonable and appropriate efforts to reduce short-term impacts of clean-up beyond minimum legal requirements, such as, but not limited to: use of rail transport rather than trucking, use of alternative fuels (e.g. biodiesel with ultra-low sulfur diesel for off road and on road vehicles), idle reduction, use of equipment retrofitted with emissions controls (e.g., diesel oxidation catalyst, diesel multistage filter, or diesel particulate filter). Other examples include waste recycling, purchasing materials with post-consumer recycled content, and water usage reduction. Information and resources are available through Smart Energy Resources Guide (SERG) and Green Remediation: Incorporating Sustainable

Environmental Practices into Remediation of Contaminated Sites. Sustainability can also be considered during RD in the evaluation and selection of technologies.

V. REMEDIAL DESIGN

SD shall perform the tasks set forth below. SD shall design the RA to ensure that it meets all objectives and Performance Standards of the ROD, the CD, and this SOW.

A. **Remedial Design Work Plan** - SD shall submit a RD Work Plan within 90 days after EPA issues an authorization to proceed pursuant to Paragraph 9 (Selection of the Supervising Contractor) of the CD. Subject to EPA's approval, the RD may be divided into parts or phases and SD may develop separate deliverables for each part or phase of work. The RD Work Plan shall:

1. Include plans and schedules for implementation of all RD activities and any pre-design tasks identified as part of this SOW. Pre-design activities are anticipated to be performed, where appropriate, and may include assessment(s)/investigation(s), bench/pilot study(ies), and the development of system performance goals (including the use of decision diagrams, etc. to assess achievement of the Performance Standards);
2. Document the overall management strategy for performing pre-design/assessment investigations and RD, and present a general approach to construction, operation, maintenance, and monitoring of the RA as necessary to implement the selected remedy;
3. Include a Design/Construction Approach, in which SD shall detail whether SD is interested in pursuing a conventional design/bid/build strategy, or the design/build approach, to design and construction. The conventional design/bid/build approach is one in which the design is taken to the 100 percent completion level to allow contractor bidding of the construction work. The design/build approach is one in which the design is developed to about the 95 percent completion level followed by subsequent field engineering during construction. EPA will indicate approval of the approach as part of RD Work Plan approval;
4. Document the responsibility and authority of all organizations and key personnel involved with the development of the RD;
5. Identify any data gaps, including whether existing data is sufficient for RD needs. Include the approach to be used to address those data gaps;
6. Provide sample design sheets and proposed templates to be used in the design (e.g. , drawing template, spec template, basis of design template, format for data management systems and coordinate systems, etc. );



7. Describe the proposed design quality assurance approach (e.g., peer review, etc.);
8. Describe how the RD and the RA will follow EPA's Superfund Green Remediation Strategy and Sustainability principles to ensure that the entire project incorporates options to minimize the environmental footprints of the clean-up action;
9. Address permitting, ARARs and any other regulatory issues;
10. Provide a process and schedule for compliance during RD and RA with any requirements that necessitate coordination with other entities (e.g., property owners, state agencies, local agencies, etc.), such as access, permitting, property rights acquisition, property leases, easements and/or licenses required for implementation of the RD and RA;
11. Provide a schedule for completion of the RA Work Plan; and
12. Include a description of, and schedule for, deliverables to be submitted during the RD work. The deliverables shall include:
  - a) Progress Reports;
  - b) Health and Safety Plan/Contingency Plan (HASP/CP);
  - c) Pre-Design Investigation and SVE Pilot Study, ISCO/SVE Bench/Pilot Study Work Plans
  - d) Pre-Design Investigation, SVE Pilot Study and ISCO/SVE Bench/Pilot Study Reports
  - e) Institutional Controls Implementation and Assurance Plan (ICIAP);
  - f) Preliminary Design Report (30%);
  - g) Pre-Final Design Report (95%);
  - h) Final Design Report (100%);
  - i) Draft Operation and Maintenance Plan (O&M Plan); and
  - j) Draft Construction Quality Assurance Project Plan (CQAP).

**B. Health and Safety Plan/Contingency Plan (HASP/CP)**

1. Health and Safety Plan (HASP) - SD shall prepare and submit for EPA review a Health and Safety Plan 30 days after EPA approval of the Final RD Work

Plan. The HASP shall describe all efforts to be made to protect on-site personnel and area residents from physical, chemical and all other hazards posed by SD's work at the Site. The HASP shall follow EPA guidance and all OSHA requirements as outlined in 29 CFR Parts 1910 and 1926. The HASP shall address the following areas:

- a) Facility Description;
- b) Personnel;
- c) Levels of protection;
- d) Safe work practices and safe guards;
- e) Medical surveillance;
- f) Personal and environmental air monitoring;
- g) Personal protective equipment;
- h) Personal hygiene;
- i) Decontamination of persons and equipment;
- j) Site work zones;
- k) Contaminant control;
- l) Logs, reports and record keeping; and
- m) Training and Safety Audits.

2. Contingency Plan (CP) - The HASP shall include a Contingency Plan (CP). The CP shall describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, treatment system failure, slope failure, etc). The CP shall include the following elements, as necessary/applicable:

- a) Name of the person or entity responsible for responding in the event of an emergency incident;
- b) Plan and date(s) for meeting(s) with the local community, including local, State and Federal agencies involved in the clean-up, as well as local emergency squads and hospitals;
- c) First aid medical information;

- d) Air Monitoring Plan;
- e) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), as specified in 40 CFR Part 109 describing measures to prevent and contingency plans for potential spills and discharges from materials handling and transportation; and
- f) Notification procedures consistent with Section XV of the CD.

**C. Pre-Design Investigation and Bench/Pilot Study** - SD shall plan and conduct with EPA review and approval Pre-Design Investigation and, if necessary, a Bench/Pilot Study to address data gaps and/or obtain new data. Pre-Design Investigations shall include, but are not limited to, condition of capping areas, extent of contamination in groundwater, soil, soil gas and/or indoor air, or NAPL occurrence. Pre-design bench/pilot studies shall include, but are not limited to, ISCO/SVE bench study, ISCO/SVE pilot implementation, and SVE pilot implementation (described below). SD shall propose any other pre-design investigation activities necessary to assess the area receiving a remedial component, including, but not limited to, investigations to assess lithology, other soil physical parameters, or other groundwater parameters.

SD shall submit the Pre-Design Investigation Work Plan(s) within 120 days after EPA approval of the Final RD Work Plan. SD shall submit the Bench/Pilot Study Work Plan(s) within 30 days after EPA approval of the Pre-Design Investigation Report(s). For any data gaps identified by EPA or SD, with EPA approval, the following shall apply:

1. SD shall submit planning documents and reports for investigations necessary to support RD (Design Investigations) and shall perform Pre-Design Investigations as approved by EPA.
2. Each Field Investigation (except the capping survey) shall include the following supporting deliverables and a schedule for their execution. These supporting deliverables shall be developed in accordance with the sections referenced below.

a) Field Investigation Work Plan(s), including:

- (1) Field Sampling Plan - SD shall prepare and submit for EPA review and approval a Field Sampling Plan. The FSP shall supplement the QAPP, address all sample collection activities, and present planned data evaluation and risk analysis approaches. The FSP shall be developed in accordance with all applicable guidance and policy (see Section VIII of this SOW). The FSP shall be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. The FSP shall describe:

- (a) Sampling objectives;
- (b) Analytical parameters, analytical methods, and holding times;
- (c) Sampling locations and frequencies, sampling procedures and equipment;
- (d) Sample preservation, sample packing, QA/QC samples;
- (e) Sample paperwork and chain-of-custody procedures, sample handling and shipping;
- (f) Management of investigation-derived wastes;
- (g) Planned uses of the data, including data evaluation approach and any risk analysis approach planned;
- (h) The sampling and data collection methods that will be used; and
- (i) A schedule for activities that must be completed in advance of sampling, including acquisition of property, access agreements, and arrangements for disposal of investigation-derived waste.

(2) Quality Assurance Project Plan (QAPP) - SD shall prepare and submit for EPA review and approval a QAPP. The QAPP shall be prepared consistent with the applicable guidance found in Section VIII of this SOW. The QAPP shall address all QA/QC requirements for the sampling efforts to which they apply. The QAPP shall cover sample analysis and data handling for all samples collected. The QAPP shall be consistent with the requirements of the EPA Contract Lab Program (CLP) for laboratories proposed outside the CLP.

(3) Pre-Design Investigation Health and Safety Plan – if not covered in existing HASP previously approved for the RD.

b) Pre-Design Investigation Report(s), which includes:

- (1) Narrative summary of the investigations performed;
- (2) Narrative summary of results;

- (3) Narrative interpretation of data, area-specific risk analysis results, and any other lines of evidence pertinent to the remedial areas;
- (4) Resultant design parameters and criteria;
- (5) Conclusions and recommendations for RD;
- (6) Summary of validated data (i.e., tables and graphics);
- (7) Data validation reports and laboratory data reports;
- (8) Results of any statistical and modeling analyses, risk analysis, comparison of data/modeling results to Action Levels or Clean-up Goals being targeted, and any other lines of evidence to be used in support of defining extent of remediation;
- (9) Copies of field notes and log books; and
- (10) Photographs documenting the work conducted.

3. Cap Survey Plan – The capping survey plan shall include a description of the survey objectives and evaluation criteria.

4. Bench/Pilot Study(ies) - If EPA determines that one or more Bench/Pilot Studies are required to provide information necessary to implement the RA (including a phased approach to RA implementation), then the Bench/Pilot Study component of the RD shall include, as applicable, the items below, and a schedule for their execution:

- a) Bench/Pilot Study Work Plan(s), including:
  - (1) Bench/Pilot Study Sampling and Analysis Plan(s), which shall comply with the same requirements as for the FSP described in Part (2)(a)(1) above;
  - (2) Quality Assurance Project Plan, which shall comply with the same requirements as for the QAPP described in Part (2)(a)(2) above; and
  - (3) Bench/Pilot Study Health and Safety Plan – if not covered in existing HASP previously approved for the RD; and
- b) Bench/Pilot Study Evaluation Report(s), which includes:
  - (1) Narrative summary of the investigations performed;

- (2) Narrative summary of results;
- (3) Narrative interpretation of data and results;
- (4) Resultant design parameters and criteria;
- (5) Conclusions and recommendations for RD including, as applicable, whether remedial approach appears to be effective and potentially capable of achieving ROD Clean-up Goals targeted;
- (6) Summary of validated data (i.e., tables and graphics);
- (7) Data validation reports and laboratory data reports;
- (8) Results of any statistical and modeling analyses;
- (9) Copies of field notes and log books; and
- (10) Photographs documenting the work conducted.

**D. Institutional Controls Implementation and Assurance Plan (ICIAP)** - SD shall prepare and submit the ICIAP for EPA review and approval within 60 days of EPA approval of the Final RD Work Plan. The ICIAP shall describe plans to implement and maintain the Institutional Controls (ICs) at the Site. Each deliverable prepared and submitted pursuant to the ICIAP (i.e. draft versions of the tools, map and legal descriptions) shall be reviewed and approved by EPA. The ICIAP shall include:

1. A description of all previously implemented ICs and ICs selected by the OU1 ROD. This description shall include:
  - a) A description of the restrictions of each IC;
  - b) A map and legal description of the boundaries of the areas covered by the restrictive covenant ICs, which conform to the following requirements:
    - (1) All legal descriptions shall be prepared according to current ALTA Survey guidelines and certified by a licensed surveyor.
    - (2) All maps and GIS information shall include, for the areas described, boundaries of the areas, property ownership, streets, easements, assessor parcel numbers and other recorded plot or survey information.



- b) A description of the restricted areas including maps and GIS information, and a plan for developing legal descriptions and final survey maps;
- c) A description of the residual concentrations of COCs likely to remain in the restricted areas after implementation of RA, a description of the pathways for exposure to such material, and a description of the containment, treatment and/or monitoring systems located in such areas;
- d) A plan for submitting draft and final restrictive covenants;
- e) Evaluation of the need for, and if appropriate, a plan and schedule for, obtaining the release or subordination of prior liens and encumbrances for each property affected by the restrictive covenants, as described in Section III.A.4.d of this SOW; and a plan and schedule for obtaining current title insurance commitments or other evidence of title acceptable to EPA demonstrating that title to the property is free and clear of all such liens and encumbrances. The title commitment shall be from a title company and shall be in the form of ALTA Commitment form -1982 (as amended); and
- f) A schedule for execution and recordation of the restrictive covenants with the Los Angeles County Recorder's Office and a schedule for SD to provide EPA and DTSC each with a certified copy of the original recorded restrictive covenants showing the clerk's recording stamps.

6. A description of plans for monitoring, maintaining, reporting on, and ensuring the continued efficacy of the ICs.

- a) Monitoring to determine compliance with and efficacy of the ICs shall include:
  - (1) Annual inspections of the areas affected by the ICs;
  - (2) Communication with owners, lessees (as appropriate) and other holders of properties affected by ICs;
  - (3) Communication with government officials regarding compliance with implemented ICs; and
  - (4) Review of any planned future uses of the affected property to determine whether such uses are consistent with the ICs.



b) The ICIAP shall include a plan for annual reports regarding monitoring of, compliance with, and efficacy of the ICs, and a schedule for submitting the annual reports. The annual reports shall include:

- (1) Descriptions of the monitoring conducted during the reporting period;
- (2) Certifications by SD that the ICs remain in place and are effective;
- (3) Documentation of any noncompliance and any resulting enforcement and corrective action;
- (4) Update of the title commitment, at least once every five years, to identify all current ownership interests; and
- (5) Any recommendations for reducing and/or removing ICs .

**E. Preliminary (30%) Design** - SD shall submit, for comment only, a Preliminary Design when the design effort is approximately 30% complete, within 120 days after later of EPA approval of the Final RD Work Plan, Pilot Study Report(s), or the completion of additional characterization activities. The Preliminary Design submittal shall include the following elements:

1. Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for any treatment train, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
2. Preliminary plans, drawings, and sketches, including design calculations;
3. Outline of required specifications;
4. Results of treatability studies and additional field sampling;
5. Proposed clean-up verification methods, including compliance with ARARs;
6. Permit requirements;
7. Access necessary to implement the RA;
8. Expected long-term monitoring and operation requirements;
9. Project Delivery Strategy;

10. A Green Remediation/Sustainability Plan that describes how the RA will be performed in accordance with EPA's Superfund Green Remediation Strategy;
11. Preliminary construction schedule, including a schedule for permit requirements;
12. Value Engineering Screen or Study - SD shall have the option of conducting Value Engineering (VE) screenings and studies. Results of any VE screening and studies will be submitted to EPA for review and approval; and
13. Draft Procurement Plan that describes SD's contracting strategy.

**F. Pre-Final (95%) Design**

1. SD shall submit the Pre-final Design when the design effort is 95% complete, within 120 days after receipt of EPA comments on the Preliminary Design. It shall be a continuation and expansion of the Preliminary Design and shall address EPA's comments regarding the Preliminary Design. The Pre-final Design shall serve as the Final Design if EPA has no further comments and EPA issues approval of the Pre-Final Design.
2. The Pre-final Design shall include those elements required for the Preliminary Design and the elements listed below, required for the Final Design.
  - a) Final plans/drawings (further described in Part 3 below);
  - b) Final specifications, including a Table of Contents, as necessary. The specifications shall be reproducible, suitable for bid advertisement, and follow the Construction Specifications Institute master format;
  - c) Survey work necessary for securing property easements or licenses and design completion;
  - d) A final engineer's construction and operation and maintenance cost estimate. This cost estimate shall update the Feasibility Study cost estimate to reflect the detail presented in the Final Design;
  - e) A proposed project schedule for the construction and implementation of the RA, including timing and specific dates for initiation and completion of all critical path tasks, major milestones, and completion of the project.
  - f) A preliminary schedule for operation and monitoring activities;
  - g) A method for selection of the construction contractor(s);

- h) A plan for implementation of construction and construction oversight;
- i) A technical specification for photographic documentation of the remedial construction work;
- j) A discussion of the manner in which the RA will achieve the Performance Standards;
- k) A description of those efforts made to secure access, institutional controls, and any other approval needed from property owners or tenants, and the results of those efforts (see Section III(A) above). Legal descriptions of any property or easements or licenses to be acquired shall be provided; and
- l) Pre-Final RD documents shall be certified by a Professional Engineer registered in the State of California.

3. The final engineering plans/drawings shall represent an accurate identification of known existing Site conditions and an illustration of the work proposed. Drawings shall represent, as necessary, all proposed equipment, improvements, details and other construction and installation items to be developed in accordance with the current standards and guidelines of the State of California. Drawings shall be submitted in both standard size, approximately 24" x 36," and half size. A list of drawing sheet titles shall be provided. Drawings shall be reproducible and suitable for bid advertisement. Typical items to be provided on such drawings include, at a minimum, the following:

- a) Title sheet including at least the title of the project, a key map, the name of the designer, date prepared, and sheet index;
- b) Name and address of owners of record for all properties within 200 feet of the Site;
- c) A Site survey including the distance and bearing of all property lines that identify and define the project Site;
- d) All recorded easements, licenses, right-of-ways, and reservations;
- e) All wells, facilities, and equipment to be constructed or installed as part of RA, if any;
- f) A topographic survey, including existing and proposed contours and spot elevations for all areas that will be affected by the remedial activities, based on U.S. Coast and Geodetic Survey data;

- g) All utilities, existing (on file with the local municipality and as identified under the available dig alert notification systems) and proposed;
- h) Location and delineation of all significant natural features including, inter alia, wooded areas, water courses, wetlands and depressions;
- i) Flood hazard data and 100-year and 500-year flood plain delineation;
- j) North arrow, scale, sheet numbers and the person responsible for preparing each sheet;
- k) Decontamination areas, staging areas, borrow areas and stockpiling areas;
- l) Miscellaneous appropriate detail sheets;
- m) Definitions of all symbols and abbreviations;
- n) A specification for a sign at RA work areas at the Site. The sign should describe the project, the name of the main contractor performing the RA work, state that the project is being performed under EPA oversight, and provide an EPA contact for further information;
- o) Site security measures for areas of active RA construction/operation;
- p) Roadways; and
- q) Electrical, mechanical, and/or structural plans for RA work, as required.

**G. Final (100%) Design** - If the Pre-Final Design is not approved by EPA, SD shall address EPA's comments regarding the Pre-Final Design and re-submit as the Final Design within 60 days after receipt of EPA comments on the Pre-final Design. The Final Design submittals shall include final versions of the Pre-Final Design as well as the following:

1. A draft Operation and Maintenance Plan (O&M Plan), described in Part I below; and
2. A draft Construction Quality Assurance Plan (CQAP), described in Part J below.

If the Pre-Final Design is approved by EPA, SD shall submit within 120 days after receipt of EPA approval, the draft O&M Plan and draft CQAP.

**H. Draft Operation and Maintenance Plan (O&M Plan)** - The draft O&M Plan shall describe long-term operation and maintenance of the Remedial Action and shall include all elements of the Site Wide Management Plan (SWMP), as described in Section VI(B). The draft O&M Plan shall be prepared in accordance with all applicable guidance, as noted in Section VIII of this SOW. Note: the schedule for the development of the Final O&M Plan shall be described in the RA Work Plan (see Section VI(A)). The draft O&M Plan shall include the following elements:

1. Description of and schedule for each operation task and maintenance task;
2. Description of and schedule for periodic inspections of equipment and components;
3. Description of instrumentation and equipment monitoring;
4. Example checklists and descriptions of periodic reports;
5. Health and Safety Requirements, including, descriptions of precautions, necessary equipment, etc., for site personnel; and safety tasks required in event of systems failure;
6. Description and analysis of potential operating problems, including common and/or anticipated remedies;
7. Description of routine monitoring, data collection and laboratory testing; schedule and procedures for monitoring; anticipated interpretation of the data;
8. A Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) for any field sampling required as part of the routine monitoring, data collection and laboratory testing. The required components of an FSP and QAPP are described in Section V(C)(2)(a);
9. Description of monitoring equipment and monitoring components, including identifying information, maintenance requirements and schedule, and replacement requirements and schedule;
10. Description of alternative operations and maintenance in case of systems failure, including:
  - a) Alternative procedures to prevent release or threatened releases of Waste Material which may endanger public health and the environment or exceed Performance Standards;

b) Analysis of vulnerability and additional resource requirements should a failure occur; and,

c) Notification and reporting requirements should O&M systems fail or be in danger of imminent failure;

11. Description of corrective action (if appropriate) to be implemented in the event that clean-up or performance standards are exceeded; and a schedule for implementing these corrective actions;

12. Description of records and reports, including daily operating logs, laboratory records, reports regarding emergencies, personnel and maintenance records; and monthly and annual reports to State agencies; and

13. If clean-up or performance standards are exceeded despite the proper operation of the remedial system in accordance with the design, the PMEP will present approaches for evaluation of achievement of asymptotic conditions, for estimating the best potential performance of the selected technology under site conditions and recommendations regarding shutdown/continued operation of the remedial system, for EPA approval.

**I. Draft Construction Quality Assurance Plan (CQAP)** - The CQAP shall detail the quality assurance program during construction activities, to ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The Final CQAP shall be submitted as specified by the RA Work Plan (see Section VI(A)). The CQAP shall address sampling, analysis, and monitoring to be performed during the remedial construction phase of the Work. Quality assurance items to be addressed include, at a minimum, the following:

1. Identification of a quality assurance official (QA Official) independent of the RA Contractor to conduct a quality assurance program during the remedial action phase of the project;

2. Qualifications of the Quality Assurance Official to demonstrate he or she possesses the training and experience necessary to fulfill his or her identified responsibilities;

3. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the RA;

4. Specific construction quality assurance systems (e.g., USACE) to be used, if any;

5. Monitoring, measurement, sampling, testing and daily logging to establish whether the RA construction is performed in compliance with design specifications, ARARs, and performance standards. This shall include identification of the sample size, locations, frequency of testing, acceptance and rejection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation;
6. Protocols for monitoring, measurement, sampling and testing;
7. Inspection and certification of the Work;
8. A detailed description of reporting requirements for CQAP activities. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation; and
9. Post-construction drawings.

VI. REMEDIAL ACTION

In accordance with the Schedule in Section VII of this SOW, SD shall notify EPA in writing of the name, title, and qualifications of any construction contractor proposed to be used in carrying out the RA under the Consent Decree. With respect to any proposed construction contractor, SD shall demonstrate that the proposed construction contractor has a quality system that complies with ANSI (see Section VIII), by submitting a copy of the proposed construction contractor's Quality Management Plan (QMP) within 45 days after EPA approval of the Final Design. The QMP should be prepared in accordance with applicable guidance (see Section VIII), or equivalent documentation as determined by EPA. If EPA disapproves of the selection of any contractor as the construction contractor, SD shall submit replacement contractors that would be acceptable to EPA within 30 days after receipt of EPA's disapproval of the contractor previously selected. EPA shall thereafter provide written notice of the name(s) of the contractor(s) it approves, if any. If at any time SD proposes to change the construction contractor, SD shall notify EPA and shall obtain approval from EPA as provided in this paragraph, before the new construction contractor performs any work under the Consent Decree.

SD shall perform the tasks set forth below. SD shall perform the RA to meet all objectives of the RA, the CD, this SOW, and all performance standards.

**A. Remedial Action Work Plan** - In accordance with the Schedule in Section VII of this SOW, SD shall submit an RA Work Plan for remedial action activities within 120 days after EPA approval of the Final Design. The RA Work Plan shall comply with relevant EPA

guidance (see Section VIII of this SOW), and shall conform to EPA's September 30, 2011 Record of Decision (the ROD) and the approved RD.

1. The RA Work Plan shall include, at a minimum, the following items:
  - a) Identity of, contact information for, and description of the roles of the members of SD's RA project team, including the Project Coordinator, QA Official, Supervising Contractor and RA Contractor;
  - b) Method of selection of contractor;
  - c) Schedule for completion of the RA, including a schedule for implementing all RA tasks identified in the approved Final Design;
  - d) Methods for satisfying permitting requirements, including obtaining permits for off-Site activity and satisfying ARARs requirements;
  - e) Methods for finalizing access agreements;
  - f) Procedures for SD request and EPA review of any proposed RD changes needed during performance of RA; and
  - g) Proposed communication schedule and plans for involvement with EPA and other stakeholders, and periodic meetings.
  
2. The RA Work Plan shall also include a discussion of, and schedule for, submittal of the following deliverables (described in detail in Section IV(B) and the remainder of this section):
  - a) Progress Reports;
  - b) Site-Wide Management Plan (SWMP);
  - c) Health and Safety Plan/Contingency Plan (HASP/CP);
  - d) Final Operation and Maintenance Plan (O&M Plan);
  - e) Performance Monitoring and Evaluation Plan (PMEP);
  - f) Waste Transportation and Off-Site Disposal Plan; and
  - g) Final Construction Quality Assurance Plan (CQAP).
  
3. The RA Work Plan shall include an excavation work plan for future areas of contamination encountered during redevelopment or construction to address the remedial action component in Section III, Part H of this SOW. The excavation work plan shall be generic in nature and be able to apply to any excavation



needed for such future areas of contamination encountered. It shall include, but not be limited to, descriptions of the following types of activities:

- a) investigation
- b) monitoring
- c) excavation
- d) waste categorization
- e) disposal (including compliance with the Off-Site Rule (42 U.S.C. § 9621(d)(3), 40 C.F.R. Part 300.440))

In addressing future areas of contamination pursuant to Section III, Part H of this SOW, if EPA determines that work other than excavation is needed then SDs shall prepare an addendum to the RA Work Plan that describes the work.

The RA Work Plan shall also define the required contents of the technical memoranda that shall be prepared upon completion of each future area response action.

**B. Site-Wide Management Plan (SWMP)** - SD shall submit a Site-Wide Management Plan within 60 days after EPA approval of the RA Work Plan, including:

1. A description of site security needs and provisions;
2. A description of the constraints and parameters imposed on the project by outside entities, including property owners, operating businesses, local agencies, etc., and a plan for accommodating these constraints in the implementation of the RA; and
3. SD shall update the SWMP following construction of the remedy to describe requirements and plans during long-term operation and monitoring.

**C. Health and Safety Plan/Contingency Plan (HASP/CP)** - SD shall submit a HASP/CP within 60 days after EPA approval of the RA Work Plan, that describes all efforts to be made to protect on-site personnel and area residents from physical, chemical and all other hazards posed by this RA. The CP shall describe procedures to be used in the event of an accident or emergency at the Site. The HASP/CP shall meet the requirements specified in Section V(B).

**D. Final Operation and Maintenance Plan (O&M Plan)** - SD shall submit a Final O&M Plan according to the schedule specified in the EPA-approved RA Work Plan, that

updates the Draft O&M Plan, submitted pursuant to Section V(I), based on information developed during the RA planning stage.

**E. Performance Monitoring and Evaluation Plan (PMEP)** - SD shall submit a Performance Monitoring and Evaluation Plan (PMEP) according to the schedule specified in the approved RA Work Plan. The purpose of the PMEP is to describe how the Performance Standards for the RA will be measured and evaluated. The PMEP shall include the following elements:

1. A description of each of the Performance Standards required by the ROD;
2. A description of how each of the Performance Standards will be met; and
3. A description of how ongoing achievement of the Performance Standards will be measured and reported. An FSP and QAPP shall be included for any environmental sampling required.

**F. Waste Transportation and Off-Site Disposal Plan** - SD shall submit a Waste Transportation and Off-Site Disposal Plan according to the schedule specified in the approved RA Work Plan.

**G. Final Construction Quality Assurance Project Plan (CQAP)** - SD shall submit a Final CQAP according to the schedule specified in the approved RA Work Plan, which shall be an update of the Draft CQAP submitted pursuant to Section V(J), based on information developed during the RA planning stage.

**H. Implementation** – SD shall implement the RA in accordance with the approved Final RD, the approved Final RA Work Plan, and the other approved plans described herein.

**I. Reports, Meetings and Oversight**

1. Preconstruction Meeting – SD shall hold a preconstruction meeting with EPA and others as directed or approved by EPA, after EPA approval of the Proposed Construction Contractor and before the start of construction. During this meeting, EPA shall review methods for documenting and reporting data, review methods for distributing and storing documents and reports, and review work area security and safety plans. SD shall prepare minutes of the preconstruction meeting, which shall be sent to all parties in attendance at the meeting.
2. Periodic Meetings - During the construction phase, SD shall communicate (i.e., in person, telephone calls, and/or electronically) weekly with EPA, and others as directed or approved by EPA, to discuss construction issues. The construction phase is defined as the period during which work is being conducted in the field to build the remedial systems. Agenda and attendees will

be specified to EPA prior to the meetings. SD shall prepare minutes of the meetings which shall be sent to all parties in attendance at the meeting within 5 days of the meeting.

3. Periodic Inspections

a) SD shall provide access to EPA during any and all periodic inspections and shall, as much as practicable, accompany EPA during these inspections.

b) Any deficiencies in construction or construction not in substantial compliance with the approved Final Design, RD change notices, and the approved final RA Work Plan will be noted during periodic inspections. Upon notification by EPA of any deficiencies in construction or construction not in substantial compliance with the approved Final Design, any approved change notices, and/or the approved RA Work Plan, SD shall take all necessary steps to correct the deficiencies and/or bring the construction into compliance with the approved Final Design, any approved design changes, and/or the approved RA Work Plan.

**J. Completion of Construction**

1. Pre-final Construction Inspection - Within 30 days after SD concludes that construction is complete for a treatment area-specific component of the RA (as defined in the CD Section XIV), SD shall schedule and conduct a pre-certification inspection to be attended by SD, EPA and DTSC. The purpose of the inspection is to determine whether the construction of the component is complete and complies with the final remedial design and the approved RA Work Plan. This inspection shall involve SD, EPA, DTSC, and contractors. The pre-final inspection shall include a walkthrough inspection of the facilities constructed for that component of the RA. SD shall certify that the equipment performs to meet the purpose and intent of the specifications. EPA shall identify and note any outstanding construction and/or operation items found during the inspection.

2. Pre-final Construction Inspection Report - SD shall submit, after each Pre-final Construction Inspection, a Pre-final Construction Inspection Report for that component of the RA within 30 days after completion of a Pre-final Construction Inspection for that component. This report shall describe all outstanding construction and/or operation items, all actions required to resolve these items, the proposed completion date for these items, and a proposed date for the final inspection.

3. Final Construction Inspection - SD will schedule and conduct, with EPA's approval, a final construction inspection for each component of the RA, within 30 days after completion of work identified in the Pre-final Construction

inspection Report. This inspection shall include another walkthrough of the facilities constructed as part of that component. SD and the RPM shall use the Pre-final Construction Inspection Report as a checklist during this inspection.

4. Remedial Action Report(s). Within 120 days after a treatment area-specific component of the RA has been fully performed and the applicable Performance Standards have been achieved, SD shall submit a written Treatment Area-Specific Remedial Action Report.

The reports shall meet the requirements specified in the CD Section XIV and comply with EPA guidance "Close Out Procedures for NPL Sites" (see Section VIII of this SOW).

5. Operational & Functional Determination - After SD concludes that each containment portion of the RA is operational and functional, SD shall notify EPA in writing within 30 days. If, after conducting any additional inspections which EPA determines are necessary, EPA agrees that the component of the RA is operational and functional, EPA shall notify SD in writing (O&F Determination). If EPA determines that the RA is not operational and functional, EPA shall notify SD of the activities that must be undertaken for the RA to attain operational and functional status and SDs shall undertake all activities described in the notice, in accordance with the schedules and specifications established therein.

6. Upon completion of construction and completion of a period of operation sufficient to establish that each component of the RA is operational and functional, as determined by EPA, SD shall submit any updates to the Final O&M Plan, SWMP, and PMEP deemed appropriate by EPA, within 90 days of EPA approval of the O&F notification. SD shall operate and maintain the components of the RA in accordance with the approved O&M Plan.

**K. Community Involvement** - If and when requested by EPA, SD shall participate in community involvement activities pursuant to the community involvement plan developed by EPA. This support shall be at the request of EPA and may include, but is not limited to: preparation of information regarding the Work to be shared with the public, dissemination of information regarding the Work to the public through mailings, public meetings or other avenues, and logistical and technical support for public meetings held or sponsored by EPA to explain activities at or relating to OU1.

## VII. SCHEDULE FOR DELIVERABLES AND MILESTONES

Reference CD/SOW Section	Major Deliverable	Due Date
CD Sec VI(9)(a)	Notification of and Quality Management Plan for proposed Supervising Contractor	10 <sup>th</sup> day following lodging of CD
CD Sec X(28)	Progress Reports <sup>1</sup>	10 <sup>th</sup> day of every reporting period <sup>2</sup> following lodging of CD
SOW Sec V(A)	Remedial Design Work Plan	90 days after Notice of Authorization to proceed with RD
SOW Sec V(B)(1)	Health and Safety Plan/Contingency Plan	30 days after EPA approval of Final RD Work Plan
SOW Sec V(C)	Pre-Design Investigation Work Plan(s)  Bench/Pilot Study Work Plan(s)	120 days after EPA approval of Final RD Work Plan  30 days after EPA approval of Pre-Design Investigation Report
SOW Sec V(C)(2)(b)	Pre-Design Investigation Report(s)	According to schedule specified in approved RD Work Plan
SOW Sec V(C)(4)(b)	Bench Study Evaluation Report  Pilot Study Evaluation Report	According to schedule specified in approved RD Work Plan
SOW Sec V(D)	Institutional Controls Implementation and Assurance Plan	60 days after EPA approval of Final RD Work Plan

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<sup>1</sup> Only electronic submission is required (no paper).

<sup>2</sup> Reporting periods are defined in Paragraph 28 of the Consent Decree as “monthly (or less frequently if agreed to by the parties) while design or construction activities are occurring, or quarterly (or less frequently if agreed to by the parties) during other periods of work.”

SOW Sec V(D)(5)(d)	Draft and final restrictive covenants	According to schedule specified in Institutional Controls Implementation and Assurance Plan
SOW Sec V(D)(5)(e)	Release or subordination of prior liens and encumbrances; current title insurance commitments or other evidence of title	According to schedule specified in Institutional Controls Implementation and Assurance Plan as appropriate
SOW Sec V(D)(5)(f)	Execution and Recordation of the Restrictive Covenants  certified copy of the original recorded restrictive covenants showing clerk's recording stamps	According to schedule specified in Institutional Controls Implementation and Assurance Plan
SOW Sec (V)(D)(6)(b)	Annual reports regarding monitoring of, compliance with, and efficacy of the ICs	According to schedule specified in Institutional Controls Implementation and Assurance Plan
SOW Sec V(E)	Preliminary Design (30%)	120 days after the latter of EPA approval of Final RD Work Plan , Pilot Study Report(s), or completion of additional characterization activities
SOW Sec V(F)	Pre-final Design (95%)	120 days after receipt of EPA comments on the Preliminary Design
SOW Sec V(G)	Final Design (100%)	60 days after receipt of EPA comments on the Pre-final Design
SOW Sec V(H)	Draft Operation and Maintenance Plan	As described in the 120 days after receipt of EPA approval of Pre-Final Design or Final Design (the later of)
SOW Sec V(I)	Draft Construction Quality Assurance Plan	120 days after receipt of EPA approval of Pre-Final Design or Final Design (the later of)
SOW Sec VI(A)	Remedial Action Work Plan	120 days after EPA approval of Final Design

SOW Sec VI	Notification of and Quality Management Plan for Proposed Construction Contractor	45 days after EPA approval of Final Design
SOW Sec VI(B)	Site-Wide Management Plan	60 days after EPA approval of RA Work Plan
SOW Sec VI(C)	Health and Safety Plan/Contingency Plan	60 days after EPA approval of RA Work Plan
SOW Sec VI(D)	Final Operation and Maintenance Plan	As specified in approved RA Work Plan
SOW Sec VI(E)	Performance Monitoring and Evaluation Plan	As specified in approved RA Work Plan
SOW Sec VI(F)	Waste Transportation and Off-Site Disposal Plan	As specified in approved RA Work Plan
SOW Sec VI(G)	Final Construction Quality Assurance Project Plan	As specified in approved RA Work Plan
SOW Sec VI(I)(1)	Preconstruction Meeting	After EPA approval of Proposed Construction Contractor and before start of construction
SOW Sec VI(I)(2)	Minutes of Periodic Meetings	Within 5 days of the meeting
SOW Sec VI(J)(1)	Pre-final Construction Inspection	30 days after SD concludes that construction is complete for a treatment area specific component of the RD
SOW Sec VI(J)(2)	Pre-final Construction Inspection Report	30 days after completion of a Pre-final Construction Inspection for that component
SOW Sec VI(J)(3)	Final Construction Inspection	30 days after completion of work identified in Pre-final Construction Inspection Report
SOW Sec VI(J)(4)	Remedial Action Report(s)	120 days after a Treatment area specific component of the RA has been fully performed and the applicable performance standards have been achieved.
SOW Sec VI(J)(5)	Operational & Functional Determination	30 days after SD concludes that each containment portion of the RA is operational and functional
SOW Sec VI(J)(6)	Updates to Final O&M Plan, SWMP, and PMP	Within 90 days of EPA approval of O&F notification

## VIII. REFERENCES/GUIDANCE DOCUMENTS

The following list, although not comprehensive, consists of many of the regulations and guidance documents that apply to the RD/RA process:

- *Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP), Parts 1, 2 and 3*, EPA-505-B-04-900A, B and C, March 2005 (see Section V. A. of the Remedial Design SOW).
- *Construction Specifications Institute's Manual of Practice, 1985 edition, available from the Construction Specifications Institute, 601 Madison Street, Alexandria, Virginia 22314.*
- *Greener Clean-ups Policy - EPA REGION 9*, issued September 14, 2009; found at: <http://www.epa.gov/region9/climatechange/green-sites.html>.
- *Superfund Green Remediation Strategy*, September 2010, <http://www.epa.gov/superfund/greenremediation/sf-gr-strategy.pdf>.
- *Superfund Community Involvement Handbook*, U. S. EPA, Office of Solid Waste and Emergency Response, April 2005, EPA-540-K-05-003.
- *EPA Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4, 2006).
- *Guidance on Expediting Remedial Design and Remedial Actions*, EPA/540/G-90/006, August 1990.
- *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites*, U. S. EPA Office of Emergency and Remedial Response (DRAFT), OSWER Directive No. 9283. 1-2.
- *Guide to Management of Investigation-Derived Wastes*, U. S. EPA, Office of Solid Waste and Emergency Response, Publication 9345. 3-03FS, January 1992.
- *Interim Guidance on Compliance with Applicable of Relevant and Appropriate Requirements*, U. S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234. 0-05.
- *Institutional Controls: A Guide to Planning, Implementing, Monitoring and Enforcing Institutional Controls Contaminated Sites*, December 2012, OSWER 9355. 0-89, EPA 540-R-09-001, <http://www.epa.gov/superfund/policy/ic/guide/index.htm>
- *National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule*, Federal Register 40 CFR Part 300, March 8, 1990.

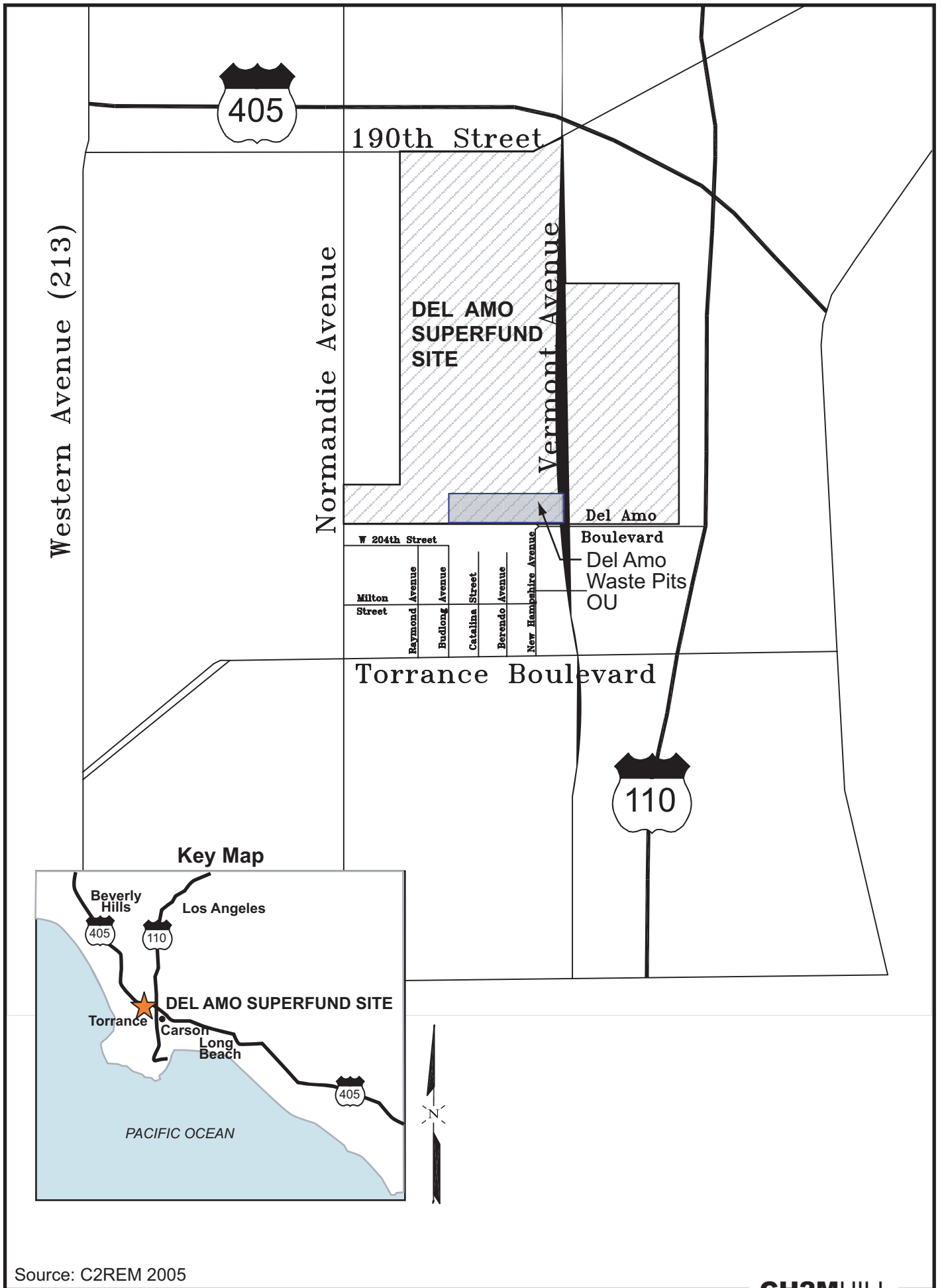


- *Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions*, February 19, 1992, OSWER Directive 9355. 7-03.
- *Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment*, American Society of Civil Engineers, May 1988.
- *Remedial Design/Remedial Action (RD/RA) Handbook*, U. S. EPA, Office of Solid Waste and Emergency Response (OSWER), 9355. 0-04B, EPA 540/R-95/059, June 1995.
- *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, U. S. EPA, EPA/240/B-01/003, March 2001, Reissued May 2006.
- *Guidance for Quality Assurance Project Plans*, U. S. EPA, EPA/240/R-02/009, December 2002.
- *Scoping the Remedial Design (Fact Sheet)*, February 1995, OSWER Publ. 9355-5-21 FS.
- *Standards for the Construction Industry*, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.
- *Standards for General Industry*, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.
- *Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties*, April 1990, EPA/540/G-90/001.
- *Value Engineering (Fact Sheet)*, U. S. EPA, Office of Solid Waste and Emergency Response, Publication 9355. 5-03FS, May 1990.
- *USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review*, EPA-540-R-00-006, June 2001.
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, EPA-540-R-08-01, June 2008.
- *American National Standards Practices for Respiratory Protection*. American National Standards Institute Z88. 2-1980, March 11, 1981.
- *A Compendium of Superfund Field Operations Methods, Two Volumes*, USEPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355. 0-14.

- *Data Quality Objectives for Remedial Response Activities*, USEPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335. 0-7B.
- *Engineering Support Branch Standard Operating Procedures and Quality Assurance Plan*, USEPA Region IV, Environmental Services Division, April 1,1986 (revised periodically).
- *NIOSH Plan of Analytical Methods, 2nd edition. Volumes I-VII for the 3rd edition, Volumes I and II*, National Institute of Occupational Safety and Health.
- *Occupational Safety and Health Guidance Plan for Hazardous Waste Site Activities*, National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/Environmental Protection Agency, October 1985.
- *Superfund Remedial Design and Remedial Action Guidance*, USEPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355. 0-4A.
- *EPA Region IX Sampling and Analysis Plan Guidance and Template* (R9QA/002. 1, April, 2000).
- *Draft: Region 9 Superfund Data Evaluation/Validation Guidance*, USEPA, Quality Assurance Office, R9QA/006. 1, December 2001.
- *Operation and Maintenance in the Superfund Program*, EPA, May 2001, (OSWER 9200. 1-37FS, EPA 540-F-01-004).
- *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs* (American National Standard, January 5, 1995), ANSI/ASQC E4-1994.
- *EPA Requirements for Quality Management Plans (QA/R-2)*, EPA/240/B-01/002, March 2001, reissued May 2006.
- *EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis* (EPA QA/G-9, 1998).
- *Close Out Procedures for National Priorities List Sites*, EPA, May 2011 (OSWER Directive 9320.2-22).

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**APPENDIX C**  
**DESCRIPTION / MAP OF THE SITE**



Source: C2REM 2005

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**APPENDIX D**

**DRAFT FORM OF PROPRIETARY CONTROLS**

## APPENDIX D

**[Bold items (other than headers) and [brackets] indicate that site specific input is needed and document is not ready for submission until all such input fields have been adequately addressed and brackets removed.]**

RECORDING REQUESTED BY:

**[Covenantor's name]**

**[Street Address]**

**[City], California [zip code]**

WHEN RECORDED, MAIL TO:

ADDRESS ABOVE, and,

State of California

Department of Toxic Substances Control

**[Street Address]**

**[City], California [zip code]**

Attention: **[Branch Chief]**

**[Branch Designation]**

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

### COVENANT TO RESTRICT USE OF PROPERTY

#### ENVIRONMENTAL RESTRICTION

(RE: Parcel Number **[Insert all Assessor's Parcel Numbers]**)

DTSC Site Code **[Site Code]**

DTSC Site Name **[Site Name]**

This Covenant and Agreement ("Covenant") is made by and between **[name of Covenantor]** (the "Covenantor"), the current owner of property situated in **[insert city name]**, County of **[insert county name]**, State of California, described in Exhibit "A" and depicted in Exhibit "B," attached, (the "Property"), and the Department of Toxic Substances Control (the "Department"). Pursuant to Civil Code section 1471, the

Department has determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials as defined in Health and Safety Code section 25260. The Covenantor and the Department, collectively referred to as the "Parties," hereby agree, pursuant to Civil Code section 1471, and Health and Safety Code section 25355.5, that the use of the Property be restricted as set forth in this Covenant; and the Parties further agree that the Covenant shall conform with the requirements of California Code of Regulations, title 22, section 67391.1. The provisions of this Covenant shall be for the benefit of, and shall be enforceable by, the United States Environmental Protection Agency ("U.S. EPA"), as a third party beneficiary pursuant to general contract law, including, but not limited to, Civil Code Section 1559.

**ARTICLE I**  
**STATEMENT OF FACTS**

1.01. The Property. The Property, totaling approximately [       acres or        square feet], is more particularly described and depicted in the attached Exhibits "A" and "B". The Property is located in the area now generally bounded by [**include narrative description of the area**]. The Property is also generally described as [**insert county name**] County Assessor's Parcel No(s): [**list exact Assessor's Parcel number(s) and ensure that the parcel(s) numbers exactly depict the Property.**]

1.02. Hazardous Substances. As defined in section 25316 of the California Health and Safety Code ("H&SC"), (within Chapter 6.8, Division 20 of the H&SC), and in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA") (42 USC §9601 (14)); and also Title 40 Code of Federal Regulations ("CFR") parts 261.3 and 302.4, hazardous substances remain on portions of the Property. These substances are also hazardous materials as defined in Health and Safety Code section 25260(d). These contaminant(s) include: [**list contaminant(s) and media impacted.**]

1.03. Remediation of the Property. The Property is being remediated pursuant to a Record of Decision ("ROD") for the [identify OU] Operable Unit of the [identify site name] Superfund Site (the "Site") issued by the U.S. EPA, dated [list ROD date]. **[Also indicate any Amendments or Explanation of Significant Differences and their effective date(s).]** Under the ROD, as modified, the U.S. EPA Region IX Superfund Division Director selected remedial actions for the Property pursuant to CERCLA. The Department concurred with this remedy. **[Describe Remedial Actions implemented pursuant to the ROD. Describe the remedial measures implemented at the Property, including, if applicable, installation of a cap and construction and ongoing operation and maintenance of a groundwater treatment system, in order to identify the remaining contaminants and physical remedial measures on the Property that necessitate this Covenant.]**

1.04. **[Use this paragraph if imposing additional restrictions on a portion of the Property, for example on a capped portion, or if for any other reason it is necessary to precisely identify any portion of the property, such as an area with groundwater monitoring wells. The purpose of this paragraph is to give the precise location of such areas.]** A limited portion of the Property is more particularly described in Exhibit "C," and referred to as the ("Capped Property" or "Ground Water Monitoring Wells," or "Soil Impound Area," or "etc."). **[Exhibit C must clearly identify the restricted area portion of the Property via a legal description, such as an engineering survey, and, if necessary, an engineering drawing depicting the Cap or other area to be restricted.]** The ("Capped Property" or "Ground Water Monitoring Wells," or "Soil Impound Area," or "etc." is/are) located in the area now generally bounded by (insert description). **[Include language that generally describes the "Capped Property" or "Ground Water Monitoring Wells," or "Soil Impound Area," or "etc.".]**

1.05. Land Use Covenant. A land use covenant is necessary to preclude residential use of the Property given that hazardous substances will remain at the Property following completion of the remediation and to preclude disruption of the selected constructed remedy. As noted above, the ROD provides for a land use covenant to limit future uses of the Property. U.S. EPA, with the concurrence of the Department, has



concluded that the Property, when remedied to the goals presented in the ROD, and when used in compliance with the terms of this Covenant, does not present an unacceptable threat to human safety or the environment. ***[Need to include the risk basis for why the land use covenant is necessary and point to the risk document at the appropriate depository.]***

## **ARTICLE II**

### **DEFINITIONS**

- 2.01. Department. "Department" means the California Department of Toxic Substances Control and includes its successor agencies, if any.
- 2.02. U.S. EPA. "U.S. EPA" means the United States Environmental Protection Agency and includes its successor agencies, if any.
- 2.03. Owner. "Owner" means the Covenantor, its successors in interest, and their successors in interest, including heirs and assigns, which at any time hold title or an ownership interest to all or any portion of the Property.
- 2.04. Occupant. "Occupant" means Owners and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Property.
- 2.05. CERCLA Lead Agency. "CERCLA Lead Agency" means the governmental entity having the designated lead responsibility to implement response action under the National Contingency Plan ("NCP"), 40 C.F.R. Part 300. U.S. EPA or a state agency acting pursuant to a contract or cooperative agreement executed under CERCLA section 104(d)(1), 42 U.S.C. 9604(d)(1), or designated pursuant to a CERCLA Memorandum of Agreement entered into under subpart F of the NCP (40 C.F.R. 300.505) may be designated CERCLA Lead Agency.

2.06 Environmental Restrictions. “Environmental Restrictions” means all protective provisions, covenants, restrictions, prohibitions, and terms and conditions as set forth in any section of this Covenant.

2.07 Improvements. “Improvements” include, but are not limited to: buildings, structures, roads, driveways, improved parking areas, wells, pipelines, or other utilities.

2.08 Lease. “Lease” means lease, rental agreement, or any other document that creates a right to use or occupy any portion of the Property.

2.09 Remedial Systems. “Remedial Systems” shall mean the remedial equipment and systems located on the Property, including **[identify remedial equipment, and/or systems]**.

### **ARTICLE III**

#### **GENERAL PROVISIONS**

3.01. Restrictions to Run with the Land. This Covenant sets forth Environmental Restrictions, that apply to and encumber the Property and every portion thereof no matter how it is improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. This Covenant: (a) Runs with the land pursuant to Health and Safety Code section 25355.5(a) and Civil Code section 1471; (b) Inures to the benefit of and passes with each and every portion of the Property; (c) Is for the benefit of, and is enforceable by the Department; and (d) Is imposed upon the entire Property unless expressly stated as applicable only to a specific portion thereof.

3.02. Binding upon Owners/Occupants. Pursuant to the Health and Safety Code, this Covenant binds all Owners and Occupants of the Property. Pursuant to Civil Code section 1471, all successive owners of the Property are expressly bound hereby for the benefit of the Department.

3.03. Incorporation into Deeds and Leases. The Covenant and its Environmental Restrictions shall be incorporated by reference in each and every deed and lease for any portion of the Property.

3.05. Conveyance of Property. The Owner shall provide written notice to the Department not later than thirty (30) days after any conveyance of any ownership interest in the Property (excluding mortgages, liens, and other non-possessory encumbrances). The written notice shall include the name and mailing address of the new owner of the Property and shall reference the DTSC site name and DTSC site code as listed on page one of this Covenant. The notice shall also include the applicable Assessor's Parcel Number ("APN") listed in Section 1.01. If the new owner's property has been assigned a different APN, each such APN that covers the Property must be provided. The Department shall not, by reason of this Covenant, have authority to approve, disapprove, or otherwise affect proposed conveyance, except as otherwise provided by law or by administrative order.

3.06. Costs of Administering the Covenant. The Department has already incurred and will in the future incur costs associated with the administration of this Covenant. Pursuant to the [ Consent Decree] entered by the \_\_\_\_\_ Court on \_\_\_\_\_, [identify parties] are responsible in the first instance to pay all costs incurred by DTSC in the administration of this Covenant. However, where the parties listed above fail to pay all costs incurred by DTSC in the administration of this Covenant, then Owners of the Property shall also be liable to DTSC for these costs. Therefore, the Covenantor hereby covenants for the Covenantor and for all subsequent Owners that, pursuant to California Code of Regulations, title 22, section 67391.1(h), the Owner agrees to pay the Department's costs in administering the Covenant as set forth herein.

#### **ARTICLE IV** **RESTRICTIONS**

4.01. Prohibited Uses. The Property shall not be used for any of the following purposes:

**[Any prohibitions other than 4.01 (a)(b)(c) and (d) below MUST be based on the appropriate decision documents and risk evaluations as set forth in the Statement of Facts above.]**

- (a) A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation.
- (b) A hospital for humans.
- (c) A public or private school for persons under 21 years of age.
- (d) A day care center for children.

4.02. Soil Management. Any contaminated soils or contaminated materials brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of State and federal law. Such soils and materials shall not be removed from the Property without a Soil Management Plan approved by the Department.

4.03. Prohibited Activities. Unless a change is authorized pursuant to Article VI of this Covenant, the following activities are specifically prohibited without prior written approval from the CERCLA Lead Agency:

- (a) **[List activities as required]**
- (b)
- (c)

4.04. Non-Interference with Remedial Systems.

- (a) The Owner and Occupant shall not participate in or allow any activity that would interfere with the operation of the Remedial Systems or other Site-wide response activities at the Property without prior written approval from the CERCLA Lead Agency, such approval not to be unreasonably withheld.
- (b) All uses and development of the Property shall preserve the integrity of the Remedial Systems or other Site-wide response activities.
- (c) Owner shall provide a copy of this Covenant to all easement holders for all or any portion of the Property.

4.05. Access for the Department and U.S. EPA. The Department shall have reasonable right of entry and access to the Property for inspection, monitoring, and

other activities for the Remedial Systems on the Property consistent with the purposes of this Covenant as deemed necessary by the Department in order to protect the public health or safety, or the environment. Nothing in this instrument shall limit or otherwise affect U.S. EPA's right of entry and access, or U.S. EPA's authority to take response actions, under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; or federal law. Nothing in this instrument shall limit or otherwise effect the Department's right of entry and access, or authority to take response actions, under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; Chapter 6.8, Division 20 of the California Health and Safety Code; California Civil Code, or other applicable State Law.

4.06 Access for Implementing Operation and Maintenance. The entity, person or persons responsible for implementing the operation and maintenance activities related to the Remedial Systems shall have reasonable right of entry and access to the Property for the purpose of implementing these operation and maintenance activities. Such right of entry and access shall continue until such time as the CERCLA Lead Agency determines that such activities are no longer required.

4.07 Inspection and Reporting Requirements. Pursuant to the Consent Decree as set forth in paragraph 3.06, the Settling Defendants have agreed to perform the necessary inspection and reporting requirements for all the institutional controls in place for the Del Amo Operable Unit 1 site. However, in the event that Settling Defendants fail to perform, when requested in writing by DTSC, the Owner shall conduct an annual inspection and submit an Annual Inspection Report to the Department for its approval by January 15<sup>th</sup> of each year. The annual report shall describe how all requirements outlined in this Covenant have been met. The annual report, filed under penalty of perjury, shall certify that the Property is being used in a manner consistent with this Covenant. The annual report must include the dates, times, and names of those who conducted and reviewed the annual inspection report. It also shall describe how the observations were performed that were the basis for the statements and conclusions in the annual report (e.g., drive by, fly over, walk in, etc.) If violations are noted, the annual report must detail the steps taken to return to compliance. If the Owner identifies any

violations of this Covenant during the annual inspections or at any other time, the Owner must, within ten (10) days of identifying the violation: determine the identity of the party in violation; send a letter advising the party of the violation of the Covenant; and demand that the violation cease immediately. Additionally, copies of any correspondence related to the enforcement of this covenant shall be sent to the Department and U.S. EPA within ten (10) days of its original transmission.

## **ARTICLE V**

### **ENFORCEMENT**

5.01. Enforcement. Failure of the Covenantor, Owner or Occupant to comply with this Covenant shall be grounds for the Department to require modification or removal of any Improvements constructed or placed upon any portion of the Property in violation of this Covenant. Violation of this Covenant, including but not limited to, failure to submit, or the submission of any false statement, record or report to the Department shall be grounds for the Department to pursue administrative, civil or criminal actions.

5.02 Enforcement Rights of U.S. EPA as a Third Party Beneficiary. U.S. EPA, as a third party beneficiary, has the right to enforce the Environmental Restrictions contained herein.

## **ARTICLE VI**

### **VARIANCE, TERMINATION, AND TERM**

6.01. Variance. Owner, or any other aggrieved person, may apply to the Department for a written variance from the provisions of this Covenant. Such application shall be made in accordance with Health and Safety Code section 25223 and a copy of the application shall be submitted to U.S. EPA simultaneously with the application submitted to the Department. No variance may be granted under this paragraph without prior notice to and an opportunity to comment by U.S. EPA.

6.02 Termination. Owner, or any other aggrieved person, may apply to the Department for a termination or modification of one or more terms of this Covenant as they apply to all or any portion of the Property. Such application shall be made in accordance with Health and Safety Code section 25224 and a copy of the application shall be submitted to U.S. EPA simultaneously with the application submitted to the Department. No termination may be granted under this paragraph without prior notice to and opportunity to comment by U.S. EPA.

6.03 Term. Unless ended in accordance with paragraph 6.02, by law, or by the Department in the exercise of its discretion, after providing notice to and an opportunity to comment by U.S. EPA, this Covenant shall continue in effect in perpetuity.

**ARTICLE VII**  
**MISCELLANEOUS**

7.01. No Dedication or Taking Intended. Nothing set forth in this Covenant shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Property, or any portion thereof to the general public or anyone else for any purpose whatsoever. Further, nothing in this Covenant shall be construed to effect a taking under State or federal law.

7.02. Notices. Whenever any person gives or serves any Notice ("Notice" as used herein includes any demand or other communication with respect to this Covenant), each such Notice shall be in writing and shall be deemed effective: (1) when delivered, if personally delivered to the person being served or to an officer of a corporate party being served, or (2) three (3) business days after deposit in the mail, if mailed by United States mail, postage paid, certified, return receipt requested:

To Owner:                   **[Covenantor's name]**  
                                     **[Street Address]**  
                                     **[City], California [zip code]**

To Department:           Department of Toxic Substances Control  
                                     Attention: **[Unit Chief]**

**[Unit]**  
**[Street Address]**  
**[City] CA [zip code]**

To the U.S. EPA: U.S. Environmental Protection Agency  
Region IX  
Attention: **[current RPM]**  
75 Hawthorne Street  
San Francisco, CA 94105-3901

Any party may change its address or the individual to whose attention a Notice is to be sent by giving written Notice in compliance with this paragraph.

7.03. Partial Invalidity. If this Covenant or any of its terms are determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant, or the application of it to any person or circumstance, shall remain in full force and effect as if such portion found invalid had not been included herein.

7.04. Statutory and Regulatory References. All statutory and regulatory references include successor provisions.

7.05. Incorporation of Attachments. All attachments and exhibits to this Covenant are incorporated herein by reference.

7.06. California Law. This Covenant shall be governed, performed and interpreted under the laws of the State of California.

7.07. No Delegation. Nothing set forth in this Covenant shall be construed to be a delegation of any authorities of DTSC under any statute or regulation.

7.08. Recordation. The Covenantor shall record this Covenant, with all referenced Exhibits, in the County of **[name of county]** within ten (10) days of the Covenantor's receipt of a fully executed original.





IN WITNESS WHEREOF, the Parties execute this Covenant.

Covenantor:

By: \_\_\_\_\_ Date: \_\_\_\_\_

**[Covenantor)**

Department of Toxic Substances Control

By: \_\_\_\_\_ Date: \_\_\_\_\_

**[Branch Chief]**

**[Branch]**

Department of Toxic Substances Control

EXHIBITS

A – LEGAL PROPERTY DESCRIPTION

B – SURVEY MAP

**[If non-interference with the remedy is included as part of the LUC, an exhibit depicting the location of the remedy components (Cap, wells, SVE system, etc.) should also be included and referenced appropriately (e.g. Exhibit C)]**

Exhibit A  
Legal Property Description  
Property Subject to Environmental Restriction

Exhibit B  
Survey Map  
Property Subject to Environmental Restriction

State of California

County of \_\_\_\_\_

On \_\_\_\_\_ before me,

\_\_\_\_\_  
(here insert name and title of the officer/notary),

Personally appeared \_\_\_\_\_

\_\_\_\_\_, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature \_\_\_\_\_ (Seal)

State of California

County of \_\_\_\_\_

On \_\_\_\_\_ before me,

\_\_\_\_\_  
(here insert name and title of the officer/notary),

Personally appeared \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature \_\_\_\_\_ (Seal)

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**APPENDIX E**

**DRAFT PERFORMANCE GUARANTEE**



APPENDIX E

**[Letterhead of Issuing Bank]**

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: [\_\_\_\_\_]

ISSUANCE DATE: [\_\_\_\_\_]

MAXIMUM AMOUNT: [U.S.\$\_\_\_\_\_]

BENEFICIARY:

APPLICANT:

U.S. Environmental Protection Agency  
c/o [Name of Regional Superfund Director]  
Director, Superfund Division, EPA Region [\_\_]  
[Address]

[Name of Settling  
Defendant]  
[Title if applicable]  
[Address]

Dear Sir or Madam:

We hereby establish our Irrevocable Standby Letter of Credit No. [\_\_\_\_] in your favor, at the request and for the account of the Applicant, [Insert name of Settling Defendant], in the amount of exactly [in words] U.S. dollars (\$XX.XX) (the "Maximum Amount"). We hereby authorize you, the U.S. Environmental Protection Agency (the "Beneficiary"), to draw at sight on us, [Insert name and address of issuing bank], an aggregate amount equal to the Maximum Amount upon presentation of:

- (1) your sight draft, bearing reference to this Letter of Credit No. [\_\_\_\_] (which may, without limitation, be presented in the form attached hereto as Exhibit A); and
- (2) your signed statement reading as follows: "I certify that the amount of the draft is payable pursuant to [that certain Consent Decree, dated \_\_\_\_\_, 20\_\_, by and among the United States and \_\_\_\_\_], entered into by the parties thereto in accordance with the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)."

This letter of credit is effective as of [insert issuance date] and shall expire on [a date at least 1 year later], but such expiration date shall be automatically extended for a period of [at least 1 year] on [the date which is at least 1 year later] and on each successive expiration date, unless, at least one hundred twenty (120) days before the current expiration date, we notify both you and [enter name of Settling Defendant posting the letter of credit] by certified mail that we have decided not to extend this letter of credit beyond the current expiration date. In the event you are

so notified, any unused portion of the credit shall immediately thereupon be available to you upon presentation of your sight draft for a period of at least 120 days after the date of receipt by both you and [enter name of Settling Defendant posting the letter of credit] of such notification, as shown on signed return receipts.

Multiple and partial draws on this letter of credit are expressly permitted, up to an aggregate amount not to exceed the Maximum Amount. Whenever this letter of credit is drawn on, under, and in compliance with the terms hereof, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft in immediately available funds directly into such account or accounts as may be specified in accordance with your instructions.

All banking and other charges under this letter of credit are for the account of the Applicant.

This letter of credit is subject to the most recent edition of the Uniform Customs and Practice for Documentary Credits, published and copyrighted by the International Chamber of Commerce.

Very Truly Yours,

**[Name and address of issuing institution]**

**[Signature(s), name(s), and title(s) of official(s) of issuing institution]**

**[Date]**

**Exhibit A - Form of Sight Draft**

United States Environmental Protection Agency

Sight Draft

TO: [Insert name of Issuing Bank]  
[Insert address of Issuing Bank]  
[\_\_\_\_\_  
\_\_\_\_\_]

RE: Letter of Credit No. [\_\_\_\_\_]

DATE: [Insert date that draw is made]

TIME: [Insert time of day that draw is made]

This draft is drawn under your Irrevocable Letter of Credit No. [\_\_\_\_\_]. Pay to the order of the United States Environmental Protection Agency, in immediately available funds, the amount of [in words] U.S. Dollars (U.S.\$[\_\_\_\_\_]) or, if no amount certain is specified, the total balance remaining available under your Irrevocable Letter of Credit No. [\_\_\_\_\_].

Pay such amount as is specified in the immediately preceding paragraph by FedWire Electronic Funds Transfer ("EFT") to the [Site name] Special Account within the EPA Hazardous Substance Superfund in accordance with current EFT procedures, referencing File Number [\_\_\_\_\_], EPA Region and Site Spill ID Number [\_\_\_\_\_], and DOJ Case Number [\_\_\_\_\_], as follows:

[Insert specific Special Account wiring instructions and information].

This Sight Draft has been duly executed by the undersigned, an authorized representative or agent of the United States Environmental Protection Agency, whose signature hereupon constitutes an endorsement.

By: \_\_\_\_\_ [signature]

\_\_\_\_\_ [name]

\_\_\_\_\_ [title]

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**APPENDIX F**

**LIST OF SETTLING DEFENDANT’S CORPORATE  
PARENTS AND SUBSIDIARIES**

## APPENDIX F

### Parent List of Shell Oil Company

Royal Dutch Shell plc

Shell Petroleum N.V.

Shell Petroleum Inc.

### Subsidiaries of Shell Oil Company

Concha Chemical Pipeline LLC

Shell Information Technology International

Deer Park Refining Limited Partnership

Shell International Exploration and Production Inc.

Infineum USA Inc.

Shell Leasing Company

Loop LLC

Shell Oil Products Company LLC

Mertvyi Kultuk LLC

Shell Rail Operations Company

Pecten Arabian Company

Shell Technology Ventures LLC

Pecten Overseas Services Company

Shell Treasury Center (West) Inc.

Pecten Trading Company

Shell US & E&P Investments LLC

Pennzoil-Quaker State Company

Shell Windenergy Inc.

Scogi. G.P.

Shell Windenergy Services Inc.

Shell Catalysts Ventures Inc.

SOPC Holdings East LLC

Shell Chemical Capital Company

SOPC Holdings West LLC

Shell Chemical LP

Shell (US) Gas & Power M&T Holdings, Inc.

Shell Communications Inc.

Shell Chemical Appalachia

Shell Downstream Inc.

Shell NA Gas & Power Holding Company

Shell EP Holdings Inc.

Shell US Hosting Company

Shell Expatriate Employment US Inc.

TMR Company

Shell Exploration & Production Company

Triton Diagnostics Inc.

Shell Global Solutions (US) Inc.

Valley Pines Associates

Woodcreek Properties