UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 9

IN THE MATTER OF: Signetics Site Triple Site Sunnyvale, California Philips Semiconductors, Inc. Respondent Proceeding Under Sections 104, 106(a) 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622	CERCLA Docket No. 2018-09 **ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR FOCUSED FEASIBILITY STUDY, REMOVAL SITE EVALUATION AND REMOVAL ACTION**

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement") is entered into voluntarily by the United States Environmental Protection Agency ("EPA") and Philips Semiconductors Inc., formerly Signetics ("Respondent"). This Settlement provides for the performance by Respondent of a focused feasibility study ("FFS"), removal site evaluation ("RSE"), and removal action to address vapor intrusion at the Signetics Site ("Signetics Site" or "Site"), and the payment of certain response costs incurred by the United States at or in connection with the Signetics Site, generally located at 811 East Arques Avenue, 440 North Wolfe Road, and 813, 815 and 830 Stewart Drive in Sunnyvale, Santa Clara County, California.

2. This Settlement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9607 and 9622 (CERCLA). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2923 (Jan. 29, 1987), and further delegated to Regional Administrators by EPA Delegation Nos. 14-14C (Administrative Actions Through Consent Orders, Jan. 18, 2017) and 14-14D (Cost Recovery Non-Judicial Agreements and Administrative Consent Orders, Jan. 18, 2017). These authorities were further redelegated by the Regional Administrator of Region IX to the director, deputy director, and branch chiefs or equivalent of the Superfund Division by Region IX Delegation Nos. R9 14-14C (May 9, 2018) and R9 14-14D (May 9, 2018).

3. EPA has notified the State of California (the "State") of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

4. EPA and Respondent recognize that this Settlement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement, the validity of the findings of facts, conclusions of law, and determinations in Section IV (Findings of Fact) and V (Conclusions of Law and Determinations) of this Settlement. Respondent agrees to comply with and be bound by the terms of this Settlement and further agrees that it will not contest the basis or validity of this Settlement or its terms.

II. PARTIES BOUND

5. This Settlement is binding upon EPA and upon Respondent and its successors and assigns. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter Respondent's responsibilities under this Settlement.

6. The undersigned representative of Respondent certifies that he or she is fully authorized to enter into the terms and conditions of this Settlement and to execute and legally bind Respondent to this Settlement.

7. Respondent shall provide a copy of this Settlement to each contractor hired to perform the Work required by this Settlement and to each person representing Respondent with respect to the Site or the Work, and shall condition all contracts entered into under this Settlement upon performance of the Work in conformity with the terms of this Settlement. Respondent or its contractors shall provide written notice of the Settlement to all subcontractors hired to perform any portion of the Work required by this Settlement. Respondent shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Settlement.

III. DEFINITIONS

8. Unless otherwise expressly provided in this Settlement, terms used in this Settlement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement or its attached appendices, the following definitions shall apply:

"Action Memorandum" shall mean those portions of that EPA Action Memorandum signed on February 18, 2015, by the Acting Assistant Director, Superfund Division, EPA Region IX, and all attachments thereto, which relate to the Site. The "Action Memorandum" is attached as Appendix A.

"Affected Property" shall mean all real property at the Site and any other real property where EPA determines, at any time, that access, land, water, or other resource use restrictions are needed to implement the FFS, RSE, and removal action, including, but not limited to, the properties located at 811 East Arques Avenue, 440 North Wolfe Road, and 813, 815 and 830 Stewart Drive in Sunnyvale, Santa Clara County, California.

"Board" shall mean the California Regional Water Quality Control Board, San Francisco Bay Region, and any successor departments or agencies of the State.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

"Day" or "day" shall mean a calendar day. In computing any period of time under this Settlement, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.

"Effective Date" shall mean the effective date of this Settlement as provided in Section XXXIII.

"Engineering Controls" shall mean constructed containment barriers or systems that control one or more of the following: downward migration, infiltration, or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.

"EPA" shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

"EPA Hazardous Substance Superfund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing deliverables submitted pursuant to this Settlement, in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Settlement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Section XI (Property Requirements) (including, but not limited to, cost of attorney time and any monies paid to secure or enforce access, including, but not limited to, the amount of just compensation), Section XV (Emergency Response and Notification of Releases), Paragraph 86 (Work Takeover), Paragraph 110 (Access to Financial Assurance), community involvement (including, but not limited to, the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e), Section XVII (Dispute Resolution), and all litigation costs. Future Response Costs shall also include Agency for Toxic Substances and Disease Registry ("ATSDR") costs regarding the Site, all Interim Response Costs, and all Interest on those Interim Response Costs Respondent has agreed to pay under this Settlement that has accrued pursuant to 42 U.S.C. § 9607(a) during the period from March 31, 2018 to the Effective Date.

"Institutional Controls" or "ICs" shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the response action pursuant to this Settlement; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site.

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year. Rates are available online at https://www.epa.gov/superfund/superfund-interest-rates.

"Interim Response Costs" shall mean all costs, including but not limited to direct and indirect costs, (a) paid by the United States in connection with the Site between March 31, 2018 and the Effective Date, or (b) incurred prior to the Effective Date, but paid after that date.

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

"Non-Settling Owner" shall mean any person, other than Respondent, that owns or controls any Affected Property, including but not limited to Pentire Property LLC (815 Stewart), Eilen Shiloh Investors LLC (830 Stewart), Lowe's HIW Inc. (811 E. Arques), 440 Wolfe Rd LLC (440 N. Wolfe). The clause "Non-Settling Owner's Affected Property" means Affected Property owned or controlled by a Non-Settling Owner.

"Paragraph" shall mean a portion of this Settlement identified by an Arabic numeral or an upper or lower-case letter.

"Parties" shall mean EPA and Respondent.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid at or in connection with the Site from August 7, 2014 through March 31, 2018, plus Interest on all such costs through such date.

"Post-Removal Site Control" shall mean actions necessary to ensure the effectiveness and integrity of any removal action to be performed pursuant to this Settlement consistent with Sections 300.415(*l*) and 300.5 of the NCP and "Policy on Management of Post-Removal Site Control" (OSWER Directive No. 9360.2-02, Dec. 3, 1990).

"Proprietary Controls" shall mean easements or covenants running with the land that (a) limit land, water, or other resource use and/or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded in the appropriate land records office.

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

"Respondent" shall mean Philips Semiconductors Inc., formerly Signetics.

"Section" shall mean a portion of this Settlement identified by a Roman numeral.

"Settlement" shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto (listed in Section 117 (Integration/Appendices)). In the event of conflict between this Settlement and any appendix, this Settlement shall control.

"Signetics Site" or "Site" shall mean the Signetics Site, located at 811 East Arques Avenue, 440 North Wolfe Road, and 813, 815 and 830 Stewart Drive in Sunnyvale, Santa Clara County, California. The Signetics Site encompasses approximately 30.9 acres and is depicted generally on the map attached as Appendix B. The Signetics Site is part of the Triple Site.

"Signetics Site Special Account" shall mean the special account within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3).

"State" shall mean the State of California.

"Statement of Work" or "SOW" shall mean the document describing the activities Respondent must perform to develop the FFS, the RSE, and any removal action for the Signetics Site, as set forth in Appendix C to this Settlement. The Statement of Work is incorporated into this Settlement and is an enforceable part of this Settlement as are any modifications made thereto in accordance with this Settlement.

"Transfer" shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"Triple Site" shall mean the sites described in Sections 1.1.1, 1.1.2, and 1.1.3 of the 1991 Record of Decision for Advanced Micro Devices # 901-902, Signetics, TRW Microwave, Combined Superfund Sites, Sunnyvale, California: (1) the Advanced Micro Devices, Inc. (AMD) Site located at 901/902 Thompson Place (now 875 Arques Avenue) in Sunnyvale, California ("AMD Site"); (2) the TRW Microwave Site located at 825 Stewart Drive, in Sunnyvale, California ("TRW Site"); (3) the Signetics Site, located at 811 East Arques Avenue, 440 North Wolfe Road, and 813, 815 and 830 Stewart Drive, in Sunnyvale, California; and (4) the Offsite Operable Unit ("OOU"), a 100-acre area, downgradient and north of the AMD, TRW and Signetics Sites defined by the area bounded by the Sunnyvale East Drainage Channel on the west and Santa Paula Avenue on the east, and as the area inside a 5 micrograms per liter (ug/L) contour for trichloroethene ("TCE") in shallow-zone groundwater.

"United States" shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

"Waste Material" shall mean (a) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and (c) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

"Work" shall mean all activities and obligations Respondent is required to perform under this Settlement, except those required by Section XIII (Record Retention).

IV. FINDINGS OF FACT

9. The Signetics Site is located at 811 East Arques Avenue, 440 North Wolfe Road, and 813, 815 and 830 Stewart Drive in Sunnyvale, Santa Clara County, California. It is part of the Triple Site. The Triple Site also consists of the AMD Site, the TRW Site and the OOU. A groundwater plume composed of volatile organic compounds ("VOCs"), including trichloroethylene ("TCE"), extends from the Triple Site approximately one mile north in Sunnyvale to past Highway 101. The AMD and TRW Sites were originally listed on the National Priorities List by EPA following the discovery of contaminant releases to soil and groundwater from their facilities located in Sunnyvale, California. The Signetics Site was proposed for inclusion on the NPL by EPA in October 1984 but was never placed on the NPL because it was being regulated as a Resource Conservation and Recovery Act ("RCRA") site at that time.

10. Signetics Company (now Philips Semiconductors, Inc.), previously a subsidiary of North American Philips Corporation, owned the property known as 811 East Arques Avenue until April 22, 2005, when ownership of the property was transferred to Lowes HIW, Inc. Beginning in 1964, Signetics Company owned and operated an integrated circuits manufacturing facility at 811 East Arques Avenue. The manufacturing process utilized various hazardous substances including TCE and other organic solvents, acids, corrosives, and metals. Philips has represented that the assets of Signetics Company which related to prior operations at the Signetics Site were sold by Philips in or about September 2006, including books, documents and records.

11. Initial investigation of soil pollution at the Signetics Site began in February 1982 following the detection of a leak in an underground waste solvent storage tank west of the building at 811 East Arques Avenue. The presence of contaminated soil was verified during the tank removal. Additional investigation of this location and at other Signetics facilities (located at 440 North Wolfe Road and 813, 815 and 830 Stewart Drive) concluded that the two probable source areas of VOCs were this waste solvent storage tank area and the wastewater neutralization tank area, both located at 811 East Arques Avenue.

12. Since 1985, the Board had been the lead agency for overseeing cleanup activities at the Triple Site, pursuant to the South Bay Multi-Site Cooperative Agreement and South Bay Ground Water Contamination Enforcement Agreement entered into by the Board and EPA on May 2, 1985.

13. On September 11, 1991, EPA Region 9 selected a remedy for the Triple Site, including the Signetics Site. The remedy for the Signetics Site combined soil and groundwater cleanup measures and expanded the existing interim remedial measures system. Specifically, groundwater extraction from the A and B Aquifers would be enhanced by the installation of additional extraction wells and an increased pumping rate at the 440 North Wolfe Road extraction trench. In addition, a soil vapor extraction ("SVE") system would be expanded by at least four more vapor extraction wells. The vacuum pumps and the carbon treatment units would be expanded to accommodate the additional wells. Finally, deed restrictions were selected to prohibit the installation of drinking water wells until the remediation was completed.

14. Remedial actions for soil began in 1982 and continued through 1987, which included the excavation of soil with total VOC concentrations above the 1 milligram per kilogram ("mg/kg") cleanup goal. Additional soil excavation occurred during the construction of the groundwater extraction trench at 440 North Wolf Road and as part of redevelopment activities in 2005.

15. Signetics installed an SVE system in 1988. Signetics expanded the SVE system in 1990 and again in 1992, and operated it until 1996. In 1996, the influent vapor concentrations dropped significantly and testing revealed that continued SVE operation would not provide additional significant removal of contamination. Signetics discontinued the SVE system with the approval of the Board in 1996.

16. Signetics initiated groundwater extraction in the A-aquifer in 1982, shortly after the discovery of contamination. Groundwater extraction and treatment have been expanded

throughout the years to include A-aquifer extraction trenches, dual-phase groundwater/soil gas extraction wells and B1 aquifer extraction wells. The original groundwater treatment system operated until July 2007, when it was shut down with Board approval during property redevelopment. A new groundwater treatment system was constructed between the buildings at 440 North Wolfe Road and 815 Stewart Drive, assigned the address of 813 Stewart Drive, and began operating in October 2008. To date, Philips has represented that the groundwater treatment systems have removed over 43,000 pounds of chemicals from the Site.

17. On December 3, 2013, EPA Region 9 issued to the Board supplemental guidelines for evaluation of vapor intrusion to indoor air and short-term inhalation exposures for TCE at the Triple Site and other NPL Sites within the South San Francisco Bay Area. On December 19, 2013, EPA Region 9 issued additional technical comments specific to vapor intrusion evaluations at the Triple Site.

18. On July 9, 2014, EPA Region 9 issued a memorandum recommending response action levels to address near-term inhalation exposures to TCE in indoor air from subsurface vapor intrusion.

19. On August 7, 2014, the Board transferred lead agency oversight responsibilities for the Triple Site to EPA Region 9.

20. Respondent commenced an in-situ groundwater treatability study at the Signetics Site in 2017. Similar to the treatability studies conducted at the AMD Site by AMD and the TRW Site by Northrup Grumman Systems Corporation, the goal of the treatability study at the Signetics Site is to explore the potential for Enhanced Reductive De-chlorination ("ERD"), or combined in-situ bioremediation and abiotic degradation, to reduce the levels of TCE in the groundwater that remain and accelerate the overall cleanup of the contaminated groundwater. Philips submitted an Evaluation Report for this effort to EPA on April 10, 2018.

21. There are four commercial buildings located within the Signetics Site: (1) 815 Stewart Drive – occupied by a health club and fitness center; (2) 830 Stewart Drive – an office building occupied by a variety of businesses including property management companies and consulting and information technology ("IT") firms; (3) 811 East Arques Avenue – a home improvement store; and (4) 440 North Wolfe Road – an office building occupied by a variety of businesses specializing in IT.

22. Indoor air sampling results collected from 15 school buildings, and 41 residential buildings in the Offsite Operable Unit of the Triple Site, including data from as recent as March 2018, show exceedances of current U.S. EPA residential Regional Screening Levels ("RSLs") for TCE. However, it is noted that for the Signetics Site, the commercial RSLs would apply rather than the residential RSLs due to current non-residential-type use of all buildings within the Signetics Site.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

23. Based on the Findings of Fact set forth above, and the administrative record, EPA has determined that:

a. The Signetics Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found at the Signetics Site, as identified in the Findings of Fact above, includes "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21). Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a). Respondent was the "owner" and/or "operator" of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

d. The conditions described in the Findings of Fact above constitute an actual and/or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

e. EPA determined in an Action Memorandum, dated February 18, 2015, that the conditions at the Triple Site, including the Signetics Site, and also described in the Findings of Fact above may constitute an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the facility within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

f. The RSE and any removal action required by this Settlement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement, will be consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

g. The FFS actions required by this Settlement are necessary to protect the public health, welfare, or the environment, are in the public interest, 42 U.S.C. § 9622(a), are consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), 9622(a), and will expedite effective remedial action, 42 U.S.C. § 9622(a).

h. EPA has determined that Respondent is qualified to conduct the FFS, RSE, and any removal action within the meaning of Section 104(a) of CERCLA, 42 U.S.C. § 9604(a), and will carry out the Work properly and promptly, in accordance with Sections 104(a) and 122(a) of CERCLA, 42 U.S.C. §§ 9604(a) and 9622(a), if Respondent complies with the terms of this Settlement.

VI. SETTLEMENT AGREEMENT AND ORDER

24. Based upon the Findings of Fact, Conclusions of Law and Determinations set forth above, and the administrative record, it is hereby Ordered and Agreed that Respondent shall comply with all provisions of this Settlement, including, but not limited to, all appendices to this Settlement and all documents incorporated by reference into this Settlement.

VII. DESIGNATION OF CONTRACTORS AND PROJECT COORDINATOR, AND REMEDIAL PROJECT MANAGER

25. **Selection of Contractors, Personnel.** All Work performed under this Settlement shall be under the direction and supervision of qualified personnel. Within thirty (30) days after the Effective Date, and before the Work outlined below begins, Respondent shall notify EPA in writing of the names, titles, addresses, telephone numbers, email addresses, and qualifications of the personnel, including contractors, subcontractors, consultants and laboratories (collectively "Personnel") to be used in carrying out such Work, unless such Personnel has already been performing environmental investigatory or remedial work for Respondent at the Site and such notification was previously made to EPA. If, after the commencement of Work, Respondent retains additional contractors or subcontractors, Respondent shall notify EPA of the names, titles, contact information, and qualifications of such contractors or subcontractors retained to perform the Work at least thirty (30) days prior to commencement of Work, or unless otherwise approved by EPA, by such additional contractors or subcontractors. EPA retains the right, at any time, to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If EPA disapproves of a selected contractor or subcontractor, Respondent shall retain a different contractor or subcontractor and shall notify EPA of that contractor's or subcontractor's name, title, contact information, and qualifications within twenty-one (21) days after EPA's disapproval. With respect to any proposed contractor, Respondent shall demonstrate that the proposed contractor demonstrates compliance with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)," EPA/240/B-01/002 (Reissued May 2006) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondent shall be subject to EPA's review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and that they do not have a conflict of interest with respect to the project.

26. Within thirty (30) days after the Effective Date, Respondent shall designate a Project Coordinator who shall be responsible for administration of the Work required by this Settlement and shall submit to EPA the designated Project Coordinator's name, title, address, telephone number, email address, and qualifications. To the extent possible, the Project Coordinator shall be present on Site or readily available during the Work. EPA retains the right to disapprove of a designated Project Coordinator who does not meet the requirements of Paragraph 225 (Selection of Contractors, Personnel). If EPA disapproves of the designated Project Coordinator, Respondent shall retain a different Project Coordinator and shall notify EPA of that person's name, title, contact information, and qualifications within fourteen (14) days following EPA's disapproval. Notice or communication relating to this Settlement from EPA to Respondent' Project Coordinator shall constitute notice or communication to Respondent.

27. EPA has designated Melanie Morash of the Superfund Division as its Project Coordinator. EPA will notify Respondent of a change of its designated Project Coordinator. Communications between Respondent and EPA, and all documents concerning the activities performed pursuant to this Settlement, shall be directed to the EPA Project Coordinator in accordance with Paragraph 31.a.

28. EPA's Project Coordinator shall have the authority lawfully vested in a Remedial Project Manager ("RPM") or On-Scene Coordinator by the NCP. In addition, EPA's Project Coordinator shall have the authority, consistent with the NCP, to halt, conduct, or direct any Work required by this Settlement, or to direct any other response action when s/he determines that conditions at the Site constitute an emergency situation or may present a threat to public health or welfare or the environment. Absence of the EPA Project Coordinator from the area under study pursuant to this Settlement shall not be cause for stoppage or delay of Work.

VIII. WORK TO BE PERFORMED

29. Respondent shall conduct the Work and prepare and implement all plans in accordance with the provisions of this Settlement, the attached SOW, the Action Memorandum, CERCLA, and the NCP, and be consistent with applicable EPA guidance.

30. For any regulation or guidance referenced in the Settlement, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Respondent receives notification from EPA of the modification, amendment, or replacement.

IX. SUBMISSION AND APPROVAL OF DELIVERABLES

31. **Submission of Deliverables**

a. **General Requirements for Deliverables**

(1) Except as otherwise provided in this Settlement, Respondent shall direct all submissions required by this Settlement to the RPM by e-mail or via other method of electronic submission for documents too large to e-mail. Respondent shall submit all deliverables required by this Settlement, the attached SOW, or any approved work plan to EPA in accordance with the schedule set forth in such plan.

(2) Respondent shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in Paragraph 31.b. All other deliverables shall be submitted in the electronic form specified by the RPM. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5 x 11 inches, Respondent shall also provide paper copies of such exhibits upon request.

b. **Technical Specifications for Deliverables**

(1) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (EDD) format. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(2) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (i) in the ESRI File Geodatabase; and (ii) as

unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at https://edg.epa.gov/EME/.

(3) Each file must include an attribute name for each site unit or sub-unit submitted. Consult https://www.epa.gov/geospatial/geospatial-policies-and-standards for any further available guidance on attribute identification and naming.

(4) Spatial data submitted by Respondent does not, and is not intended to, define the boundaries of the Site.

32. **Approval of Deliverables**

a. **Initial Submissions**

(1) After review of any deliverable that is required to be submitted for EPA approval under this Settlement or the attached SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

(2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause an imminent and substantial threat to human health or the environment; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

b. **Resubmissions**. Upon receipt of a notice of disapproval under Paragraph 32.a (Initial Submissions), or if required by a notice of approval upon specified conditions under Paragraph 32.a, Respondent shall, within thirty (30) days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (a) approve, in whole or in part, the resubmission; (b) approve the resubmission upon specified conditions; (c) modify the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring Respondent to correct the deficiencies; or (e) any combination of the foregoing.

c. **Implementation**. Upon approval, approval upon conditions, or modification by EPA under Paragraph 32.a (Initial Submissions) or Paragraph 32.b (Resubmissions), of any

deliverable, or any portion thereof: (i) such deliverable, or portion thereof, will be incorporated into and enforceable under the Settlement; and (ii) Respondent shall take any action required by such deliverable, or portion thereof. Implementation of any non-deficient portion of a submission shall not relieve Respondent of any liability for penalties under Section XIX (Stipulated Penalties) for violations of this Settlement.

33. Notwithstanding the receipt of a notice of disapproval, Respondent shall proceed to take any action required by any non-deficient portion of the submission, unless otherwise directed by EPA.

34. In the event that EPA takes over some of the tasks, but not the preparation of the FFS Report, Respondent shall incorporate and integrate information supplied by EPA into those reports.

35. Respondent shall not proceed with any activities or tasks dependent on the deliverables listed in the SOW until receiving EPA approval, approval on condition, or modification of such deliverables. While awaiting EPA approval, approval on condition, or modification of these deliverables, Respondent shall proceed with all other tasks and activities that may be conducted independently of these deliverables, in accordance with the schedule set forth under this Settlement.

36. For all remaining deliverables not listed in Paragraph 35, Respondent shall proceed with all subsequent tasks, activities, and deliverables without awaiting EPA approval of the submitted deliverable. EPA reserves the right to stop Respondent from proceeding further, either temporarily or permanently, on any task, activity or deliverable at any point during the Work.

37. **Material Defects**. If an initially submitted or resubmitted plan, report, or other deliverable contains a material defect, and the plan, report, or other deliverable is disapproved or modified by EPA under Paragraph 32.a (Initial Submissions) or 32.b (Resubmissions) due to such material defect, Respondent shall be deemed in violation of this Settlement for failure to submit such plan, report, or other deliverable timely and adequately. Respondent may be subject to penalties for such violation as provided in Section XIX (Stipulated Penalties).

38. Neither failure of EPA to expressly approve or disapprove of Respondent's submissions within a specified time period, nor the absence of comments, shall be construed as approval by EPA.

X. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

39. Respondent shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with "EPA Requirements for Quality Assurance Project Plans (QA/R5)," EPA/240/B-01/003 (March 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)," EPA/240/R-02/009 (December 2002), and "Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A-900C (March 2005).

40. **Laboratories**

a. Respondent shall ensure that EPA personnel and its authorized representatives are allowed access at reasonable times to all laboratories utilized by Respondent pursuant to this Settlement. In addition, Respondent shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the Quality Assurance Project Plan ("QAPP") for quality assurance, quality control, and technical activities that will satisfy the stated performance criteria as specified in the QAPP and that sampling and field activities are conducted in accordance with the Agency's "EPA QA Field Activities Procedure" CIO 2105-P-02.1 (9/23/2014), available at https://www.epa.gov/irmpoli8/epa-qa-field-activities-procedures. Respondent shall ensure that the laboratories it utilizes for the analysis of samples taken pursuant to this Settlement meet the competency requirements set forth in EPA's "Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions," available at https://www.epa.gov/measurements/documents-about-measurement-competency-under-acquisition-agreements, and that the laboratories perform all analyses using EPA-accepted methods. Accepted EPA methods consist of, but are not limited to, methods that are documented in the EPA's Contract Laboratory Program (https://www.epa.gov/superfund/programs/clp/), SW 846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (https://www.epa.gov/hw-sw846), "Standard Methods for the Examination of Water and Wastewater" (http://www.standardmethods.org/), and 40 C.F.R. Part 136, "Air Toxics - Monitoring Methods" (https://www.epa.gov/ttnamti1/airtox.html).

b. Upon approval by EPA, Respondent may use other appropriate analytical methods, as long as (i) quality assurance/quality control ("QA/QC") criteria are contained in the methods and the methods are included in the QAPP, (ii) the analytical methods are at least as stringent as the methods listed above, and (iii) the methods have been approved for use by a nationally recognized organization responsible for verification and publication of analytical methods, e.g., EPA, ASTM, NIOSH, OSHA, etc.

c. Respondent shall ensure that all laboratories it uses for analysis of samples taken pursuant to this Settlement have a documented Quality System that complies with ASQ/ANSI E4:2014 "Quality Management Systems for Environmental Information and Technology Programs – Requirements With Guidance for Use" (American Society for Quality, February 2014), and "EPA Requirements for Quality Management Plans (QA/R-2)" EPA/240/B-01/002 (March 2001, reissued May 2006), or equivalent documentation as determined by EPA. EPA may consider Environmental Response Laboratory Network (ERLN) laboratories, laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP"), or laboratories that meet International Standardization Organization (ISO 17025) standards or other nationally recognized programs as meeting the Quality System requirements.

d. Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Settlement are conducted in accordance with the procedures set forth in the approved QAPP.

41. **Sampling**

a. Upon request, Respondent shall provide split or duplicate samples to EPA or its authorized representatives. Respondent shall notify EPA not less than seven (7) days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA shall

have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall provide to Respondent split or duplicate samples of any samples it takes as part of EPA's oversight of Respondent' implementation of the Work, and any such samples shall be analyzed in accordance with the approved QAPP.

b. Respondent waives any objections to any data gathered, generated, or evaluated by EPA, the State or Respondent in the performance or oversight of the Work that has been verified according to the QA/QC procedures required by this Settlement or any EPA-approved FFS Work Plans or Sampling and Analysis Plans. If Respondent objects to any other data relating to the FFS, RSE, or the removal action, Respondent shall submit to EPA a report that specifically identifies and explains its objections, describes the acceptable uses of the data, if any, and identifies any limitations to the use of the data. The report must be submitted to EPA within thirty (30) days after the quarterly progress report or other report containing the data.

XI. PROPERTY REQUIREMENTS

42. **Agreements Regarding Access and Non-Interference.** Respondent shall, with respect to any Non-Settling Owner's Affected Property, use best efforts to secure from such Non-Settling Owner an agreement, enforceable by Respondent and the United States, providing that such Non-Settling Owner: (i) provide EPA and its representatives, contractors, and subcontractors with access at all reasonable times to such Affected Property to conduct any activity regarding the Settlement, including those listed in Paragraph 42.a (Access Requirements); and (ii) refrain from using such Affected Property in any manner that EPA determines will interfere with or adversely affect the implementation or integrity of the Work including the restrictions listed in Paragraph 42.b (Land, Water, Indoor Air, or Other Resource Use Restrictions). Respondent shall provide a copy of such access and use restriction agreement(s) to EPA.

a. **Access Requirements.** The following is a list of activities for which access is required regarding the Affected Property:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to EPA;

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

(4) Obtaining samples;

(5) Assessing the need for, planning, implementing, or monitoring response actions;

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

(7) Implementing the Work pursuant to the conditions set forth in Paragraph 86 (Work Takeover);

(8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondent or its agents, consistent with Section XII (Access to Information);

(9) Assessing Respondent's compliance with the Settlement;

(10) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Settlement; and

(11) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, indoor air, or other resource use restrictions regarding the Affected Property.

b. **Land, Water, Vapor Intrusion/Indoor Air, or Other Resource Use Restrictions.**

(1) The following is a list of land and water use restrictions applicable to the Affected Property at 811 East Arques Avenue based on a 1992 deed restriction:

i. Prohibition on the use of the upper water-bearing aquifers as a source and/or supply of drinking water; and

ii. Prohibition on the drilling, construction, installation, inspection, maintenance, replacement, removal, usage, or operation of any groundwater extraction or monitoring wells on the Affected Property, with the exception of any such wells located on or operated on the Affected Property as may be necessary to investigate, characterize and remediate groundwater contamination pursuant to any order of any local, state or federal governmental or regulatory agency.

(2) The following is a list of possible future vapor intrusion/indoor air use restrictions that may be applicable to any Affected Property:

i. Requirement for further consideration, investigation and/or mitigation of potential exposures below, within, or above the protective risk range for TCE.

ii. Requirements for occupants and property owners to comply with any building-specific Operations, Maintenance and Monitoring Plans ("OM&M" Plans), which include procedures for ongoing maintenance and periodic monitoring to confirm continued operation of mitigation systems.

43. **Best Efforts.** As used in this Section, "best efforts" means the efforts that a reasonable person in the position of Respondent would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements, as required by this Section. If

Respondent is unable to accomplish what is required through "best efforts" in a timely manner, it shall notify EPA and include a description of the steps taken to comply with the requirements. If EPA deems it appropriate, it may assist Respondent, or take independent action, in obtaining such access and/or use restrictions. All costs incurred by the United States in providing such assistance or taking such action, including the cost of attorney time and the amount of monetary consideration or just compensation paid, constitute Future Response Costs to be reimbursed under Section XVI (Payment of Response Costs).

44. If EPA determines in a decision document prepared in accordance with the NCP that Institutional Controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are needed, Respondent shall cooperate with EPA's efforts to secure and ensure compliance with such Institutional Controls.

45. In the event of any Transfer of the Affected Property, unless EPA otherwise consents in writing, Respondent shall continue to comply with its obligations under the Settlement, including its obligation to secure access and ensure compliance with any land, water, or other resource use restrictions regarding the Affected Property.

46. Notwithstanding any provision of the Settlement, EPA retains all of its access authorities and rights, as well as all of its rights to require land, water, or other resource use restrictions, including enforcement authorities related thereto under CERCLA, RCRA, and any other applicable statute or regulations.

XII. ACCESS TO INFORMATION

47. Respondent shall provide to EPA, and the State upon EPA's request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within Respondent's possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Settlement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Respondent shall also make available to EPA, and the State upon EPA's request, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

48. **Privileged and Protected Claims**

a. Respondent may assert that all or part of a Record requested by EPA is privileged or protected as provided under federal law, in lieu of providing the Record, provided Respondent complies with Paragraph 48.b, and except as provided in Paragraph 48.c.

b. If Respondent asserts a claim of privilege or protection, it shall provide EPA with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Respondent shall provide the Record to EPA in redacted form to mask the privileged or protected portion only. Respondent shall retain all Records

that it claims to be privileged or protected until EPA has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in Respondent's favor.

c. Respondent may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondent is required to create or generate pursuant to this Settlement.

49. **Business Confidential Claims**. Respondent may assert that all or part of a Record provided to EPA under this Section or Section XIII (Record Retention) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Respondent shall segregate and clearly identify all Records or parts thereof submitted under this Settlement for which Respondent asserts business confidentiality claims. Records claimed as confidential business information will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified Respondent that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Respondent.

50. Notwithstanding any provision of this Settlement, EPA retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XIII. RECORD RETENTION

51. Until ten (10) years after EPA provides Respondent with notice, pursuant to Section XXX (Notice of Completion of Work), that all Work has been fully performed in accordance with this Settlement, Respondent shall preserve and retain all non-identical copies of Records (including Records in electronic form) in its possession or control, or that come into its possession or control, that relate in any manner to its liability under CERCLA with regard to the Site, provided, however, that Respondent who are potentially liable as owners or operators of the Site must retain, in addition, all Records that relate to the liability of any other person under CERCLA with respect to the Site. Respondent must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work, provided, however, that Respondent (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

52. At the conclusion of the document retention period, Respondent shall notify EPA at least ninety (90) days prior to the destruction of any such Records, and, upon request by EPA, and except as provided in Paragraph 48 (Privileged and Protected Claims), Respondent shall deliver any such Records to EPA.

53. Except as set forth in Paragraph 10 above (specifically in regards to the 2006 sale of assets including books and records, etc.), Respondent certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by EPA or the State and that it has fully complied with any and all EPA and State requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law.

XIV. COMPLIANCE WITH OTHER LAWS

54. Nothing in this Settlement limits Respondent's obligations to comply with the requirements of all applicable state and federal laws and regulations when performing the FFS, RSE, or any removal action.

55. Nothing in this Settlement limits Respondent's obligations to comply with the requirements of all applicable state and federal laws and regulations, except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Settlement shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws.

56. No local, state, or federal 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), including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the Work that is not on-site requires a federal or state permit or approval, Respondent shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. Respondent 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 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. This Settlement is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XV. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

57. **Emergency Response.** If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release. Respondent shall take these actions in accordance with all applicable provisions of this Settlement, including, but not limited to, the Health and Safety Plan. Respondent shall also immediately notify EPA's Project Coordinator or, in the event of his/her unavailability, the Regional Duty Officer at (800) 300-2193 of the incident

or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA for all costs of such response action not inconsistent with the NCP pursuant to Section XVI (Payment of Response Costs).

58. **Release Reporting**. Upon the occurrence of any event during performance of the Work that Respondent is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, Respondent shall immediately orally notify EPA's Project Coordinator or, in the event of his/her unavailability, the Regional Duty Officer at (800) 300-2193, and the National Response Center at (800) 424-8802. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004.

59. For any event covered under this Section, Respondent shall submit a written report to EPA within fourteen (14) days after the onset of such event, setting forth the action or event that occurred and the measures taken, and to be taken, to mitigate any release or threat of release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release or threat of release.

XVI. PAYMENT OF RESPONSE COSTS

60. **Payment for Past Response Costs**

a. Within thirty (30) days after the Effective Date, Respondent shall pay to EPA $95,050.39 for Past Response Costs. Unless otherwise directed by EPA, Respondent shall make payment to EPA by Fedwire Electronic Funds Transfer (EFT), Automated Clearinghouse (ACH) online or official bank check in any of the manners discussed below.

For ETF payment:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
33 Liberty Street
New York, NY 10045
Field Tag 4200 of the Fedwire message should read "D 68010727 Environmental Protection Agency"

and shall reference Site/Spill ID Number 0994 and the EPA docket number for this action.

For ACH payment:

Respondent shall make payment to EPA by Automated Clearinghouse (ACH) to:

PNC Bank

808 17th Street, NW
Washington, DC 20074
Contact – Jesse White 301-887-6548
ABA = 051036706
Transaction Code 22 - checking
Environmental Protection Agency
Account 310006
CTX Format

and shall reference Site/Spill ID Number 0994 and the EPA docket number for this action.

For online payment:

Respondent shall make payment at https://www.pay.gov to the U.S. EPA account in accordance with instructions to be provided to Respondent by EPA.

For official bank check:

Respondent shall make payment by official bank check made payable to "EPA Hazardous Substance Superfund." Each check, or a letter accompanying each check, shall identify the name and address of the party making payment, the Site name, Site/Spill ID Number 0994, and the EPA docket number for this action, and shall be sent to:

U.S. Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
PO Box 979076
St. Louis, MO 63197-9000]

b. At the time of payment, Respondent shall send notice that payment has been made by email to EPA's Project Coordinator (Melanie Morash at morash.melanie@epa.gov), EPA Site Attorney (Rebekah Reynolds at reynolds.rebekah@epa.gov), EPA Cost Recovery Specialist (Gwendolyn Brown at brown.gwenl@epa.gov), and the EPA Cincinnati Finance Office, by email at cinwd_acctsreceivable@epa.gov, or by mail to:

EPA Cincinnati Finance Office
26 . Martin Luther King Drive
Cincinnati, Ohio 45268

Such notice shall reference Site/Spill ID Number 0994 and the EPA docket number for this action.

c. **Deposit of Past Response Costs Payments.** The total amount to be paid by Respondent pursuant to Paragraph 60 shall be deposited by EPA in the Signetics Site Special Account to be retained and used to conduct or finance response actions at or in connection with the Signetics Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

61. **Payments for Future Response Costs.** Respondent shall pay to EPA all Future Response Costs not inconsistent with the NCP.

a. **Periodic Bill.** On a periodic basis, EPA will send Respondent a bill requiring payment that includes a cost summary report, which includes direct and indirect costs incurred by EPA, its contractors, subcontractors, and the United States Department of Justice. Respondent shall make all payments within thirty (30) days after Respondent's receipt of each bill requiring payment, except as otherwise provided in Paragraph 63 (Contesting Future Response Costs), and in accordance with Paragraphs 60.a and 60.b (Payments for Past Response Costs).

b. **Deposit of Future Response Costs Payments.** The total amount to be paid by Respondent pursuant to Paragraph 61.a (Periodic Bill) shall be deposited by EPA in the Signetics Site Special Account to be retained and used to conduct or finance response actions at or in connection with the Signetics Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund, provided, however, that EPA may deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund if, at the time the payment is received, EPA estimates that the Signetics Site Special Account balance is sufficient to address currently anticipated future response actions to be conducted or financed by EPA at or in connection with the Signetics Site. Any decision by EPA to deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund for this reason shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Settlement or in any other forum.

62. **Interest.** In the event that any payment for Past Response Costs or Future Response Costs is not made by the date required, Respondent shall pay Interest on the unpaid balance. The Interest on Past Response Costs and prepaid Future Response Costs shall begin to accrue on the Effective Date. The Interest on all subsequent Future Response Costs shall begin to accrue on the date of the bill. The Interest shall accrue through the date of Respondent's payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XIX (Stipulated Penalties).

63. **Contesting Future Response Costs.** Respondent may initiate the procedures of Section XVII (Dispute Resolution) regarding payment of any Future Response Costs billed under Paragraph 61 (Payments for Future Response Costs) if it determines that EPA has made a mathematical error or included a cost item that is not within the definition of Future Response Costs, or if it believes EPA incurred excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. To initiate such a dispute, Respondent shall submit a Notice of Dispute in writing to EPA's Project Coordinator within thirty (30) days after receipt of the bill. Any such Notice of Dispute shall specifically identify the contested Future Response Costs and the basis for objection. If Respondent submits a Notice of Dispute, Respondent shall within the thirty (30)-day period, also as a requirement for initiating the dispute, (a) pay all uncontested Future Response Costs to EPA in the manner described in Paragraph 61, and (b) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation ("FDIC") and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondent shall send to EPA's Project Coordinator a copy of the transmittal letter and check

paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. If EPA prevails in the dispute, within fourteen (14) days after the resolution of the dispute, Respondent shall pay the sums due (with accrued interest) to EPA in the manner described in Paragraph 61. If Respondent prevails concerning any aspect of the contested costs, Respondent shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to EPA in the manner described in Paragraph 61. Respondent shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XVII (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondent' obligation to reimburse EPA for its Future Response Costs.

XVII. DISPUTE RESOLUTION

64. Unless otherwise expressly provided for in this Settlement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement. The Parties shall attempt to resolve any disagreements concerning this Settlement expeditiously and informally.

65. **Informal Dispute Resolution**. If Respondent objects to any EPA action taken pursuant to this Settlement, including billings for Future Response Costs, it shall send EPA a written Notice of Dispute describing the objection(s) within thirty (30) days after such action. EPA and Respondent shall have thirty (30) days from EPA's receipt of Respondent's Notice of Dispute to resolve the dispute through informal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Settlement.

66. **Formal Dispute Resolution**. If the Parties are unable to reach an agreement within the Negotiation Period, Respondent shall, within thirty (30) days after the end of the Negotiation Period, submit a statement of position to EPA's Director of the Superfund Division. EPA may, within thirty (30) days thereafter, submit a statement of position. Thereafter, an EPA management official at the Director of the Superfund Division level or higher will issue a written decision on the dispute to Respondent. EPA's decision shall be incorporated into and become an enforceable part of this Settlement. Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

67. Except as provided in Paragraph 63 (Contesting Future Response Costs) or as agreed by EPA, the invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of Respondent under this Settlement. Except as provided in Paragraph 76, stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Settlement. In the event that Respondent

does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XIX (Stipulated Penalties).

XVIII. FORCE MAJEURE

68. "Force Majeure" for purposes of this Settlement, is defined as any event arising from causes beyond the control of Respondent, of any entity controlled by Respondent, or of Respondent's contractors that delays or prevents the performance of any obligation under this Settlement despite Respondent's best efforts to fulfill the obligation. The requirement that Respondent exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work or increased cost of performance; or a failure to attain performance standards set forth in the Action Memorandum.

69. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement, Respondent shall notify EPA's Project Coordinator orally or, in his or her absence, the alternate EPA Project Coordinator, or, in the event both of EPA's designated representatives are unavailable, the Assistant Director of the Superfund Division, EPA Region 9, within forty-eight (48) hours of when Respondent first knew that the event might cause a delay. Within seven (7) days thereafter, Respondent shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health or welfare, or the environment. Respondent shall include with any notice all applicable documentation supporting its claim that the delay was attributable to a force majeure. Respondent shall be deemed to know of any circumstance of which Respondent, any entity controlled by Respondent, or Respondent's contractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude Respondent from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 68 and whether Respondent has exercised its best efforts under Paragraph 68, EPA may, in its unreviewable discretion, excuse in writing Respondent's failure to submit timely or complete notices under this Paragraph.

70. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this Settlement that are affected by the force majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify Respondent in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

71. If Respondent elects to invoke the dispute resolution procedures set forth in Section XVII (Dispute Resolution), it shall do so no later than fifteen (15) days after receipt of EPA's notice described in Paragraph 70, above. In any such proceeding, Respondent shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondent complied with the requirements of Paragraphs 68 and 69. If Respondent carries this burden, the delay at issue shall be deemed not to be a violation by Respondent of the affected obligation of this Settlement identified to EPA.

72. The failure by EPA to timely complete any obligation under the Settlement is not a violation of the Settlement, provided, however, that if such failure prevents Respondent from meeting one or more deadlines under the Settlement, Respondent may seek relief under this Section.

XIX. STIPULATED PENALTIES

73. Respondent shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 74 for failure to comply with this Settlement, unless excused under Section XVIII (Force Majeure). "Comply" as used in the previous sentence includes compliance by Respondent with all applicable requirements of this Settlement, within the deadlines established under this Settlement.

74. **Stipulated Penalty Amounts** The following stipulated penalties shall accrue per violation per day for any noncompliance with this Settlement:

Penalty Per Violation Per Day	Period of Noncompliance
$ 500.00	1st through 14th day
$ 1000.00	15th through 30th day
$ 2000.00	31st day and beyond

75. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 86 (Work Takeover), Respondent shall be liable for a stipulated penalty in the amount of $500,000. In the event that the cost of the Work that EPA assumes pursuant to Paragraph 86 (Work Takeover) is less than $500,000, Respondent shall be liable for a stipulated penalty in an amount no greater than the cost of the Work. Stipulated penalties under this Paragraph are in addition to the remedies available to EPA under Paragraphs 86 (Work Takeover) and 110 (Access to Financial Assurance).

76. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Penalties shall continue to accrue during any dispute resolution period, and shall be paid within thirty (30) days after the agreement or the receipt of EPA's decision. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Section IX (Submission and Approval of Deliverables), during

the period, if any, beginning on the thirty-first (31st) day after EPA's receipt of such submission until the date that EPA notifies Respondent of any deficiency; and (b) with respect to a decision by the EPA Division Director of the Superfund Division, under Paragraph 66 (Formal Dispute Resolution), during the period, if any, beginning on the twenty-first (21st) day after the Negotiation Period begins until the date that the EPA Management Official issues a final decision regarding such dispute. Nothing in this Settlement shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement.

77. Following EPA's determination that Respondent has failed to comply with a requirement of this Settlement, EPA may give Respondent written notification of the failure and describe the noncompliance. EPA may send Respondent a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondent of a violation.

78. All penalties accruing under this Section shall be due and payable to EPA within thirty (30) days after Respondent's receipt from EPA of a demand for payment of the penalties, unless Respondent invokes the Dispute Resolution procedures under Section XVII (Dispute Resolution) within the thirty (30)-day period. All payments to EPA under this Section shall indicate that the payment is for stipulated penalties and shall be made in accordance with Paragraph 61 (Payments for Future Response Costs).

79. If Respondent fails to pay stipulated penalties when due, Respondent shall pay Interest on the unpaid stipulated penalties as follows: (a) if Respondent 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 76 until the date of payment; and (b) if Respondent fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 78 until the date of payment. If Respondent fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

80. The payment of penalties and Interest, if any, shall not alter in any way Respondent's obligation to complete performance of the Work required under this Settlement.

81. Nothing in this Settlement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), provided, however, that EPA shall not seek civil penalties pursuant Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), or punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), for any violation for which a stipulated penalty is provided in this Settlement, except in the case of willful violation of this Settlement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 86 (Work Takeover).

82. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement.

XX. COVENANTS BY EPA

83. Except as provided in Section XXI (Reservations of Rights by EPA), EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work, Past Response Costs, and Future Response Costs. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the complete and satisfactory performance by Respondent of its obligations under this Settlement. These covenants extend only to Respondent and do not extend to any other person.

XXI. RESERVATIONS OF RIGHTS BY EPA

84. Except as specifically provided in this Settlement, nothing in this Settlement shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants, or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing in this Settlement shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

85. The covenant not to sue set forth in Section XX (Covenants by EPA) above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:

a. liability for failure by Respondent to meet a requirement of this Settlement;

b. liability for costs not included within the definitions of Past Response Costs or Future Response Costs;

c. liability for performance of response action other than the Work;

d. criminal liability;

e. liability for violations of federal or state law that occur during or after implementation of the Work;

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

g. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

h. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site not paid as Future Response Costs under this Settlement.

86. **Work Takeover**

a. In the event EPA determines that Respondent: (1) has ceased implementation of any portion of the Work; (2) is seriously or repeatedly deficient or late in its performance of the Work; or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to Respondent. Any Work Takeover Notice issued by EPA (which writing may be electronic) will specify the grounds upon which such notice was issued and will provide Respondent a period of fourteen (14) days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the fourteen (14)-day notice period specified in Paragraph 86.a, Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary ("Work Takeover"). EPA will notify Respondent in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this Paragraph 86.b. Funding of Work Takeover costs is addressed under Paragraph 110 (Access to Financial Assurance).

c. Respondent may invoke the procedures set forth in Section XVII (Dispute Resolution) to dispute EPA's implementation of a Work Takeover under Paragraph 86.b. However, notwithstanding Respondent's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under Paragraph 86.b until the earlier of (1) the date that Respondent remedies, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, or (2) the date that a written decision terminating such Work Takeover is rendered in accordance with Paragraph 66 (Formal Dispute Resolution).

d. Notwithstanding any other provision of this Settlement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANTS BY RESPONDENT

87. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Past Response Costs, Future Response Costs, or this Settlement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claims under Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607, and 9613, Section 7002(a) of RCRA, 42 U.S.C. § 6972(a), or state law regarding the Work, Past Response Costs, Future Response Costs, and this Settlement;

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

88. Except as provided in Paragraph 91 (Waiver of Claims by Respondent), these covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Section XXI (Reservations of Rights by EPA), other than in Paragraph 85.a (liability for failure to meet a requirement of the Settlement), 85.d (criminal liability), or 85.e (liability for violations of federal or state law), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

89. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

90. Respondent reserves, and this Settlement is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of Respondent's deliverables or activities.

91. **Waiver of Claims by Respondent**

a. Respondent agrees not to assert any claims and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613) that it may have:

(1) ***De Micromis* Waiver**. For all matters relating to the Site against any person where the person's liability to Respondent with respect to the Site is based solely on 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, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials.

b. **Exceptions to Waiver**

(1) The waiver under this Paragraph 91 shall not apply with respect to any defense, claim, or cause of action that Respondent may have against any person otherwise covered by such waiver if such person asserts a claim or cause of action relating to the Site against Respondent.

(2) The waiver under Paragraph 91.a(1) (De Micromis Waiver) shall not apply to any claim or cause of action against any person otherwise covered by such waiver if EPA determines that: (i) the materials containing hazardous substances contributed to the Site by such person contributed significantly or could contribute significantly, either individually or in the aggregate, to the cost of the response action or natural resource restoration at the Site; or (ii) such person has failed to comply with any information request or administrative subpoena issued pursuant to Section 104(e) or 122(e) of CERCLA, 42 U.S.C. § 9604(e) or 9622(e), or Section 3007 of RCRA, 42 U.S.C. § 6927, or has impeded or is impeding, through action or inaction, the performance of a response action or natural resource restoration with respect to the Site; or if (iii) such person has been convicted of a criminal violation for the conduct to which the waiver would apply and that conviction has not been vitiated on appeal or otherwise.

XXIII. OTHER CLAIMS

92. By issuance of this Settlement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or EPA shall not be deemed a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement.

93. Except as expressly provided in Paragraphs 91 (Waiver of Claims by Respondent) and Section XX (Covenants by EPA), nothing in this Settlement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages, and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

94. No action or decision by EPA pursuant to this Settlement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIV. EFFECT OF SETTLEMENT/CONTRIBUTION

95. Except as provided in Paragraphs 91 (Waiver of Claims by Respondent), nothing in this Settlement shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Settlement. Except as provided in Section XXII (Covenants by Respondent), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action which each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto. Nothing in this Settlement diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2).

96. The Parties agree that this Settlement constitutes an administrative settlement pursuant to which Respondent has, as of the Effective Date, resolved liability to the United States within the meaning of Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), and is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), or as may be otherwise provided by law, for the "matters addressed" in this Settlement. The "matters addressed" in this Settlement are the Work, Past Response Costs, and Future Response Costs.

97. The Parties further agree that this Settlement constitutes an administrative settlement pursuant to which Respondent has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

98. Respondent shall, with respect to any suit or claim brought by it for matters related to this Settlement, notify EPA in writing no later than sixty (60) days prior to the initiation of such suit or claim. Respondent also shall, with respect to any suit or claim brought against it for matters related to this Settlement, notify EPA in writing within ten (10) days after service of the complaint or claim upon it. In addition, Respondent shall notify EPA within ten (10) days after service or receipt of any Motion for Summary Judgment and within ten (10) days after receipt of any order from a court setting a case for trial, for matters related to this Settlement.

99. In any subsequent administrative or judicial proceeding initiated by EPA, or by the United States on behalf of EPA, for injunctive relief, recovery of response costs, or other relief relating to the Site, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenant by EPA set forth in Section XX (Covenants By EPA).

100. Effective upon signature of this Settlement by Respondent, Respondent agrees that the time period commencing on the date of its signature and ending on the date EPA receives from Respondent the payment(s) required by Paragraphs 60 (Payment for Past Response Costs) and, if any, Section XIX (Stipulated Penalties) shall not be included in computing the running of any statute of limitations potentially applicable to any action brought by the United States related to the "matters addressed" as defined in Paragraph 96 and that, in any action brought by the United States related to the "matters addressed," Respondent will not assert, and may not maintain, any defense or claim based upon principles of statute of limitations, waiver, laches, estoppel, or other defense based on the passage of time during such period. If EPA gives notice to Respondent that it will not make this Settlement effective, the statute of limitations shall begin to run again commencing ninety (90) days after the date such notice is sent by EPA.

XXV. INDEMNIFICATION

101. The United States does not assume any liability by entering into this Settlement or by virtue of any designation of Respondent as EPA's authorized representatives under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), and 40 C.F.R. § 300.400(d)(3). Respondent shall indemnify, save, and hold harmless the United States, its officials, agents, employees, contractors, subcontractors, and representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, and any persons acting on Respondent's behalf or under its control, in carrying out activities pursuant to this Settlement. Further, Respondent agrees to pay the United States all costs it incurs, including but not limited to attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Settlement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondent in carrying out activities pursuant to this Settlement. Neither Respondent nor any such contractor shall be considered an agent of the United States.

102. The United States shall give Respondent notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondent prior to settling such claim.

103. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondent shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXVI. INSURANCE

104. No later than fifteen (15) days before commencing any on-site Work, Respondent shall secure, and shall maintain until the first anniversary after issuance of Notice of Completion of Work pursuant to Section XXX (Notice of Completion of Work), commercial general liability insurance with limits of liability of $1 million per occurrence, automobile liability insurance with limits of liability of $1 million per accident, and umbrella liability insurance with limits of liability of $2 million in excess of the required commercial general liability and automobile liability limits, naming EPA as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Respondent pursuant to this Settlement. In addition, for the duration of the Settlement, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy,

all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing Work on behalf of Respondent in furtherance of this Settlement. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, then, with respect to the contractor or subcontractor, Respondent need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Respondent shall ensure that all submittals to EPA under this Paragraph identify the Signetics Site, Sunnyvale, California and the EPA docket number for this action.

XXVII. FINANCIAL ASSURANCE

105. In order to ensure completion of the Work, Respondent shall secure financial assurance, initially in the amount of $2,000,000 ("Estimated Cost of the Work"), for the benefit of EPA. The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA or under the "Financial Assurance - Settlements" category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/, and satisfactory to EPA. Respondent may use multiple mechanisms if they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, and/or insurance policies.

a. A surety bond guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. An irrevocable letter of credit, payable to or at the direction of EPA, that is issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency;

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

e. A demonstration by Respondent that it meets the financial test criteria of Paragraph 107, accompanied by a standby funding commitment, which obligates the Respondent to pay funds to or at the direction of EPA, up to the amount financially assured through the use of this demonstration in the event of a Work Takeover; or

f. A guarantee to fund or perform the Work executed in favor of EPA by a company: (1) that is a direct or indirect parent company of Respondent or has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with Respondent; and (2) can demonstrate to EPA's satisfaction that it meets the financial test criteria of Paragraph 107.

106. Respondent shall, within thirty (30) days of the Effective Date, obtain EPA's approval of the form of Respondent's financial assurance. Within ninety (90) days of such approval, Respondent shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to the Regional Financial Assurance Specialist (SFD-7-5) and Regional Financial Management Officer (EMD-4-1) at 75 Hawthorne Street, San Francisco, California, 94105.

107. Respondent if seeking to provide financial assurance by means of a demonstration or guarantee under Paragraph 105.e or 105.f, must, within thirty (30) days of the Effective Date:

a. Demonstrate that:

(1) the Respondent or guarantor has:

i. Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

ii. Net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) The Respondent or guarantor has:

i. A current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

ii. Tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. Submit to EPA for the Respondent or guarantor: (1) a copy of an independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA or under the "Financial Assurance-Settlements" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/.

108. Respondent if providing financial assurance by means of a demonstration or guarantee under Paragraph 105.e or 105.f must also:

a. Annually resubmit the documents described in Paragraph 107.b within ninety (90) days after the close of the Respondent's or guarantor's fiscal year;

b. Notify EPA within thirty (30) days after the Respondent or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. Provide to EPA, within thirty (30) days of EPA's request, reports of the financial condition of the Respondent or guarantor in addition to those specified in Paragraph 107.b; EPA may make such a request at any time based on a belief that the Respondent or guarantor may no longer meet the financial test requirements of this Section.

109. Respondent shall diligently monitor the adequacy of the financial assurance. If Respondent becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, Respondent shall notify EPA of such information within fourteen (14) days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify the Respondent of such determination. Respondent shall, within sixty (60) days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for the Respondent, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed ninety (90) days. Respondent shall follow the procedures of Paragraph 111 (Modification of Amount, Form, or Terms of Financial Assurance) in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism.

Respondent's inability to secure financial assurance in accordance with this Section does not excuse performance of any other obligation under this Settlement.

110. **Access to Financial Assurance**

a. If EPA issues a notice of implementation of a Work Takeover under Paragraph 86.b, then, in accordance with any applicable financial assurance mechanism and/or related standby funding commitment, EPA is entitled to: (1) the performance of the Work; and/or (2) require that any funds guaranteed be paid in accordance with Paragraph 110.d.

b. If EPA is notified by the issuer of a financial assurance mechanism that it intends to cancel the mechanism, and the Respondent fails to provide an alternative financial assurance mechanism in accordance with this Section at least thirty (30) days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with Paragraph 110.d.

c. If, upon issuance of a notice of implementation of a Work Takeover under Paragraph 86.b, either: (1) EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism, whether in cash or in kind, to continue and complete the Work; or (2) the financial assurance is a demonstration or guarantee under Paragraphs 105.e or 105.f, then EPA is entitled to demand an amount, as determined by EPA, sufficient to cover the cost of the remaining Work to be performed. Respondent shall, within thirty (30) days of such demand, pay the amount demanded as directed by EPA.

d. Any amounts required to be paid under this Paragraph 110 shall be, as directed by EPA: (i) paid to EPA in order to facilitate the completion of the Work by EPA or by another person; or (ii) deposited into an interest-bearing account, established at a duly chartered bank or trust company that is insured by the FDIC, in order to facilitate the completion of the Work by another person. If payment is made to EPA, EPA may deposit the payment into the EPA Hazardous Substance Superfund or into the Signetics Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund

e. All EPA Work Takeover costs not paid under this Paragraph 110 must be reimbursed as Future Response Costs under Section XVI (Payment of Response Costs).

111. **Modification of Amount, Form, or Terms of Financial Assurance**. Respondent may submit, on any anniversary of the Effective Date or at any other time agreed to by the Parties, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with Paragraph 106, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance. EPA will notify Respondent of its decision to approve or disapprove a requested reduction or change pursuant to this Paragraph. Respondent may reduce the amount of the financial assurance mechanism only in accordance with: (a) EPA's approval; or (b) if there is a dispute, the agreement or written decision resolving such dispute under Section XVII (Dispute Resolution). Respondent may change the form or terms of the financial assurance mechanism

only in accordance with EPA's approval. Any decision made by EPA on a request submitted under this Paragraph to change the form or terms of a financial assurance mechanism shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Settlement or in any other forum. Within thirty (30) days after receipt of EPA's approval of, or the agreement or decision resolving a dispute relating to, the requested modifications pursuant to this Paragraph, Respondent shall submit to EPA documentation of the reduced, revised, or alternative financial assurance mechanism in accordance with Paragraph 106.

112. **Release, Cancellation, or Discontinuation of Financial Assurance**. Respondent may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a Notice of Completion of Work under Section XXX (Notice of Completion of Work); (b) in accordance with EPA's approval of such release, cancellation, or discontinuation; or (c) if there is a dispute regarding the release, cancellation or discontinuance of any financial assurance, in accordance with the agreement or final decision resolving such dispute under Section XVII (Dispute Resolution).

XXVIII. MODIFICATION

113. EPA's Project Coordinator may modify any plan or schedule or the SOW in writing or by oral direction. Any oral modification will be memorialized in writing by EPA promptly, but shall have as its effective date the date of EPA's Project Coordinator's oral direction. Any other requirements of this Settlement may be modified in writing by mutual agreement of the parties.

114. If Respondent seeks permission to deviate from any approved work plan or schedule or the SOW, Respondent's Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from EPA's Project Coordinator pursuant to Paragraph 113.

115. No informal advice, guidance, suggestion, or comment by EPA's Project Coordinator or other EPA representatives regarding any deliverable submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Settlement, or to comply with all requirements of this Settlement, unless it is formally modified.

XXIX. ADDITIONAL RESPONSE ACTION

116. If EPA determines that additional response actions not included in the Indoor Air/Vapor Intrusion RSE and any Necessary Removal Action Work Plan ("Vapor Work Plan") or other approved plan(s) are necessary to protect public health, welfare, or the environment, and such additional response actions are consistent with the Action Memorandum and SOW, EPA will notify Respondent of that determination. Unless otherwise stated by EPA, within thirty (30) days after receipt of notice from EPA that additional response actions are necessary to protect public health, welfare, or the environment, Respondent shall submit for approval by EPA a work plan for the additional response actions. The plan shall conform to the applicable requirements of Section VIII (Work to Be Performed) of this Settlement. Upon EPA's approval of the plan pursuant to the SOW, Respondent shall implement the plan for additional response actions in

accordance with the provisions and schedule contained therein. This Section does not alter or diminish the EPA Project Coordinator's authority to make oral modifications to any plan or schedule pursuant to Section XXVIII (Modification).

XXX. NOTICE OF COMPLETION OF WORK

117. When EPA determines that all Work has been fully performed in accordance with this Settlement, with the exception of any continuing obligations required by this Settlement, including payment of Future Response Costs, land, water, indoor air, or other resource use restrictions, Post-Removal Site Controls, and Record Retention, EPA will provide written notice to Respondent. If EPA determines that any Work has not been completed in accordance with this Settlement, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the FFS Work Plan and/or Vapor Work Plan, if appropriate, in order to correct such deficiencies. Respondent shall implement the modified and approved FFS Work Plan and/or Vapor Work Plan and shall submit a modified draft FFS Report and/or modified Removal-related reports in accordance with the EPA notice. Failure by Respondent to implement the approved modified FFS Work Plan and/or Vapor Work Plan shall be a violation of this Settlement.

XXXI. INTEGRATION/APPENDICES

118. This Settlement and its appendices constitute the final, complete, and exclusive agreement and understanding among the Parties with respect to the Work embodied in this Settlement. The parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Settlement. The following appendices are attached to and incorporated into this Settlement:

a. "Appendix A" is the Action Memorandum.

b. "Appendix B" is a map of the Signetics Site.

c. "Appendix C" is the SOW.

XXXII. ADMINISTRATIVE RECORD

119. EPA will determine the contents of the administrative record file for selection of the remedial action. Respondent shall submit to EPA documents developed during the course of the FFS upon which selection of the remedial action may be based. Upon request of EPA, Respondent shall provide copies of plans, task memoranda for further action, quality assurance memoranda and audits, raw data, field notes, laboratory analytical reports, and other reports. Upon request of EPA, Respondent shall additionally submit any previous studies conducted under state, local, or other federal authorities that may relate to selection of the remedial action, and all communications between Respondent and state, local, or other federal authorities concerning selection of the remedial action.

XXXIII. EFFECTIVE DATE

120. This Settlement shall be effective three (3) days after the Settlement is signed by the Assistant Director.

IT IS SO AGREED AND ORDERED:

U.S. ENVIRONMENTAL PROTECTION AGENCY:

3/12/2019
Dated

Dana Barton
Assistant Director
Superfund Division

Signature Page for Settlement Regarding the Signetics Site

FOR PHILIPS SEMICONDUCTORS, INC:

December 12, 2018
Dated

Paul Cavanaugh
Paul Cavanaugh
Vice President
Philips Semiconductors, Inc.
3000 Minuteman Road
Building One
Andover, MA 01810

12-11-2018
Dated

Joseph E. Innamorati
Vice President & Secretary
Philips Semiconductors, Inc.
3000 Minuteman Road
Building One
Andover, MA 01810

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IX
75 Hawthorne Street
San Francisco, CA 94105

ACTION MEMORANDUM

DATE: February 18, 2015

SUBJ: Request for a Time-Critical Removal Action at the Triple Site
Sunnyvale, Santa Clara County, California

FROM: Melanie Morash, Remedial Project Manager
California Cleanup Sites Section I

THRU: Caleb Shaffer, Chief
California Cleanup Sites Section I

TO: John Lyons, Assistant Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed removal action described herein to investigate, and if necessary, to mitigate threats posed to human health and the environment by the presence of trichloroethene (TCE), located at the Triple Site (the Site) in Sunnyvale, Santa Clara County, California. The proposed removal of hazardous substances will be undertaken pursuant to Section 104(a)(1) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9604(a)(1), and Section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.415. Any action taken pursuant to this Action Memorandum will be predicated on the need to take immediate action to protect human health and the environment, based upon site sampling results.

II. SITE CONDITIONS AND BACKGROUND

SITE NAME:	Triple Site
CERCLIS ID#:	CAD070466479
SITE ID#:	A974
CATEGORY:	Time-Critical
SITE LOCATION:	Sunnyvale, California
NPL STATUS:	Not on the NPL

A. Site Description

1. Physical Location

The Site includes three chlorinated solvent groundwater sites in Sunnyvale – the Advanced Micro Devices 901/902 Thompson Place Superfund Site (AMD 901/902 Site) located at 901/902 Thompson Place, the Philips (formerly Signetics) Site (Philips Site) located at 811 East Arques Avenue, 440 North Wolfe Road, and facilities along Stewart Drive, and the TRW Microwave Superfund Site (TRW Site) located at 825 Stewart Drive (together, the source sites). The primary contaminant of concern (COC) at the Site is trichloroethene (TCE), however other TCE breakdown products and related volatile organic compounds (VOCs) are present at elevated levels in the groundwater (see below).

The Site to which this Action Memorandum applies also includes the Offsite Operable Unit (OOU), which includes the area of the neighborhood outside the source sites' property boundaries, which has been impacted by commingled TCE-containing groundwater from the three source sites. The OOU area includes the neighborhood around Duane/San Miguel Avenue to just past Highway 101 to the north, and between the Sunnyvale East Drainage Channel on the west and Santa Paula Avenue on the east. Concentrations of TCE in the shallow groundwater in the OOU are elevated above the EPA Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L).[1] The Site is depicted in the attached map.

2. Site Characteristics

Land use in the vicinity of the Triple Site is comprised of a mixture of residential and light commercial properties, including four neighborhood schools and their associated open playing fields. These four schools, as well as over 900 households, are located within the OOU; collectively, this area is informally referred to as the Duane/San Miguel Avenue neighborhood.

According to the EPA Environmental Justice mapping tool, the Site is located in an environmental justice area. Residents in the area are predominantly Asian and Hispanic, with a significant population that don't speak English as a first language. According to the 2010 census, 2,552 people (916 households) live within the OOU, 82% of which (2,090 individuals) belong to a minority group.

The three source sites contributed to the commingled TCE plume in the OOU, due to historical semiconductor and other electronics manufacturing operations from the early years of Silicon Valley (dating back to the 1960s). Groundwater contamination from the

[1] U.S. EPA Maximum Contaminant Level (MCL) for trichloroethene (TCE) in drinking water of 5 micrograms per liter (µg/L) or parts per billion (ppb), available at http://water.epa.gov/drink/contaminants/ accessed Feb 2015.

AMD 901/902 and TRW Sites resulted from localized spills and leaking underground storage tanks and piping, including releases from spent solvent tanks and equipment associated with acid neutralization systems. As regards the Philips Site, Philips Semiconductors, Inc. (Philips; formerly Signetics), operated a semiconductor manufacturing facility at the 811 East Arques Avenue property beginning in 1964. The manufacturing processes employed utilized various organic solvents (including TCE), acids, corrosives, and metals.

Chemicals of concern (COCs) for the OOU include 1,1-dichloroethane (1,1-DCA); 1,1-dichloroethene (1,1-DCE); cis-1,2-dichloroethene (cis-1,2-DCE); trans-1,2-dichloroethene (trans-1,2-DCE); Freon 113; 1,1,1-trichloroethane (1,1,1-TCA); TCE; tetrachloroethene (PCE); vinyl chloride; and chloroform. The depth to groundwater in the OOU ranges from 5-15 feet, with TCE concentrations in the OOU groundwater as high as 550 ug/L.

3. Site History

In August 2014, lead agency oversight responsibility for the Site was transferred from the State of California, Regional Water Quality Control Board, San Francisco Bay (Regional Board) to EPA Region 9. Prior to this transfer, the Regional Board was the lead agency overseeing the long-term cleanup activities at the Site. This was pursuant to the South Bay Multi-Site Cooperative Agreement and South Bay Ground Water Contamination Enforcement Agreement entered into by the Regional Board and EPA in May 1985.

Transfer of lead agency oversight responsibility occurred because EPA is in a better position to oversee the vapor intrusion evaluations necessary at the Site and amend the 1991 Record of Decision (ROD), see below, which did not address the vapor intrusion (VI) pathway.

4. Vapor Intrusion Remedial Investigation/Feasibility Study

A VI Remedial Investigation/Feasibility Study (RI/FS) is underway in the OOU to assess the groundwater-to-indoor air VI pathway, with TCE the primary focus of the evaluation. The purpose of the RI/FS is to evaluate whether the VI pathway is complete in any buildings within the OOU, to identify any actual or potential unacceptable exposures due to vapor intrusion, and finally to identify and implement appropriate mitigation activities, including time-critical removal actions, where warranted.

Outreach activities in December 2014 to affected residents in the Duane/San Miguel Avenue neighborhood included preparation and dissemination of letters and fact sheets to the school community and general public, coordination with the City of Sunnyvale and Sunnyvale Public School District for a public meeting, a mailer (including fact sheets and access request forms) to over one thousand tenants and property owners, a door-to-door

outreach effort to over 400 households, and ongoing follow-up activities to schedule testing with the school administrations and local residents.

The VI study area includes the 4 neighborhood schools and 414 households, inclusive of single-family residences, duplexes, and all ground-floor apartment units of multi-family complexes. Indoor air sampling began on January 22, 2015 and is currently ongoing, utilizing both passive diffusion samplers and evacuated canisters for schools (8-, 10-, 12-, 24-hour and 7-day samples) and passive diffusion samplers for residences (24-hour and 7-day samples).

5. Other State and Federal Investigations

VI investigations at the Site by Philips were initiated following a request from the Regional Board in March 2003. Soil gas sampling was conducted at two school campuses and in the nearby residential area where the highest groundwater VOC concentrations within the OOU are present. Since soil gas concentrations were elevated in certain areas, indoor air sampling was subsequently conducted at these two schools and annually thereafter at the school overlying the highest VOC concentrations to assess levels of VOCs in indoor air due to vapor intrusion.

On December 3, 2013 EPA Region 9 issued supplemental guidelines on VI evaluations and indoor air TCE short-term inhalation exposures for the Site and other NPL sites within the South San Francisco Bay area ("South Bay Sites"), recommending that vapor intrusion evaluations:

(a) follow a "multiple-lines-of-evidence" approach as outlined in EPA's 2013 Office of Solid Waste and Emergency Response (OSWER) *External Review Draft – Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from the Subsurface to Indoor Air;*

(b) include multiple rounds of sampling, including winter heating season sampling and crawlspace sampling for residences;

(c) include heating, ventilation, and air conditioning (HVAC) system "on" and "off" sampling at commercial-type buildings;

(d) include source ("on-property") building sampling; and

(e) include all buildings overlying 5 μg/L TCE shallow-zone groundwater contamination (South Bay Sites TCE Groundwater Screening Level).

On December 19, 2013 EPA Region 9 issued additional technical comments specific to VI evaluations at the Site.

On July 9, 2014, EPA Region 9 issued a technical assessment and recommendations regarding action levels, investigation approaches and response measures to address "inhalation exposures to trichloroethylene (TCE) in indoor air from the subsurface vapor intrusion pathway."

In May 2014 Philips submitted a workplan for indoor air sampling at 3 schools located within the OOU. Following additional discussions with EPA and the transfer of lead agency oversight responsibility for the Site in August 2014, Philips submitted a revised workplan in January 2015 which added indoor air sampling at the fourth neighborhood school and all residences overlying 5 µg/L TCE shallow-zone groundwater contamination in the OOU. This VI evaluation is part of the RI/FS discussed above and is currently in progress.

6. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

Based on information available at this time, the principal hazardous substances or pollutants or contaminants that are being released or for which there is a threat of release include, but are not necessarily limited to, the list below.

Hazardous Substances or Pollutants or Contaminants	Media
VOCs, including TCE	Groundwater, indoor air, soil gas

Sampling results indicate TCE to be present in *groundwater* at levels which exceed the EPA Maximum Contaminant Level (MCL) for drinking water and the EPA Region 9 South Bay Sites TCE groundwater screening level of 5 µg/L. Additionally, sampling results indicate TCE to be present in *indoor air* at levels which exceed the EPA Regional Screening Levels (RSLs) of 0.48 and 2 micrograms per cubic meter ($\mu g/m^3$) and the EPA Region 9 Interim TCE Indoor Air Residential Urgent Response Action Level of 6 $\mu g/m^3$ and at levels in *soil gas* which exceed the EPA Vapor Intrusion Screening Levels (VISLs) of 4.8 and 21 $\mu g/m^3$ (see below). **This data demonstrates that a completed pathway for vapor intrusion is occurring at the Site.**

Groundwater:

Hazardous Substances or Pollutants or Contaminants	Highest Concentration Observed in the OOU	EPA MCL & South Bay Sites TCE Groundwater Screening Level
TCE	550 µg/L	5 µg/L

Indoor Air:

Hazardous Substances or Pollutants or Contaminants	Highest Concentration Observed in the OOU	EPA Long-Term Screening Level[2]	EPA Short-Term Screening Level (Accelerated – Response in Weeks)[3][4]	EPA Short-Term Screening Level (Urgent – Response in Days)
TCE	16 $\mu g/m^3$ [School Building]	0.48 $\mu g/m^3$	2 $\mu g/m^3$	6 $\mu g/m^3$

Soil Gas:

Hazardous Substances or Pollutants or Contaminants	Highest Concentration Observed in the OOU	EPA Long-Term Screening Level[5]	EPA Short-Term Screening Level
TCE	13,000 $\mu g/m^3$	4.8 $\mu g/m^3$	21 $\mu g/m^3$

[2] EPA Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, Carcinogenic Screening Level, Target Risk 1.0E-6 Excess Lifetime Cancer Risk, available at http://www.epa.gov/region9/superfund/prg/ accessed Feb 2015.
[3] EPA RSL for Chemical Contaminants at Superfund Sites, Noncarcinogenic Screening Level, Hazard Index=1, available at http://www.epa.gov/region9/superfund/prg/ accessed Feb 2015.
[4] EPA Region 9 Interim TCE Indoor Air Response Action Levels – Residential and Commercial TCE Inhalation Exposure from Vapor Intrusion, Accelerated and Urgent Response Action Levels, available at http://www.epa.gov/region9/triplesite accessed Feb 2015.
[5] EPA Vapor Intrusion Screening Level (VISL) Calculator, Sub-slab or Exterior Soil Gas Concentration to Indoor Air Concentration, available at http://www.epa.gov/oswer/vaporintrusion/guidance.html accessed Feb 2015.

7. NPL Status

EPA's 1991 Record of Decision (ROD) included four operable units: the AMD 901/902 Site, the TRW Site, the Philips Site, and the OOU. The AMD 901/902 and TRW Sites are listed on the National Priorities List (NPL), however the Philips Site is not currently on the NPL. EPA proposed its listing in 1989 but decided against it at that time because it was being regulated as a Resource Conservation and Recovery Act (RCRA) site. The Philips Site is now a closed RCRA facility and regulated as a Superfund Site. Plumes from the three sites and the OOU are comingled.

B. Other Actions to Date

1. Previous Actions

In 1984 and 1989 the Regional Board issued Cleanup and Abatement Orders, requiring Advanced Micro Devices (AMD), Signetics, and TRW Microwave to develop a joint plan to prevent the further migration of contaminants.

At the AMD 901/902 Site, underground acid neutralization system tanks and contaminated soil were removed and groundwater extraction and treatment was performed.

At the TRW Site, spent solvent underground tanks and associated equipment and contaminated soil were removed, following which soil vapor extraction (SVE) and groundwater extraction and treatment were conducted.

Subsequent to the shut-down of the AMD 901/902 and TRW Site groundwater extraction systems, implementation of in-situ bioremediation programs was initiated at these two sites (in 2000 at TRW and in 2002 at AMD 901/902) to accelerate the timeframe for cleanup of the groundwater.

Initial investigation at the Philips Site began in February 1982 with the detection of a leak in an underground waste solvent storage tank at the 811 East Arques Avenue property. The presence of contaminated soil was verified during the tank removal. Following additional investigation at this location and at the other Philips facilities (located at 440 North Wolfe Road, 815 and 830 East Arques Avenue and Stewart Drive) this waste solvent storage tank and a wastewater neutralization tank area (both at the 811 East Arques Avenue property) were identified as the principle source of contaminants from the Philips Site and impacting downgradient areas within the OOU.

Since 1986, Philips has operated a groundwater extraction, treatment and monitoring program to monitor and control the migration of TCE and other VOCs in the groundwater beneath the Site, including within the OOU.

2. Current Actions

Currently, a total of 29 groundwater extraction wells are operating within the OOU. Groundwater extracted from these sources is treated by a combination of ultraviolet (UV) oxidation and air stripping and discharged in accordance with state and federal requirements.

In-situ bioremediation work continues at the AMD 901/902 and TRW Sites, and additional former source area removal work is being conducted at the TRW Site, prior to the final build-out of the on-site building.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

Until August 2014 when lead agency oversight responsibility for the Site was transferred to EPA Region 9, the Regional Board was the lead agency overseeing the long-term cleanup activities at the Site. EPA continues to coordinate with the Regional Board by providing VI technical expertise and assisting in indoor air sampling at 8 other State-lead South San Francisco Bay NPL sites.

EPA also coordinates closely with the City of Sunnyvale regarding the VI evaluation activities at the Site, and meets regularly with the City to keep officials apprised of Site progress and jointly plan ongoing community outreach activities.

2. Potential for Continued State/Local Response

EPA expects to continue its supportive relationship with the Regional Board on the South San Francisco Bay NPL sites, including coordinating with the Regional Board on VI evaluations and Five Year Reviews at nearby sites in Sunnyvale, including the Advanced Micro Devices 915 DeGuigne Drive Superfund Site, the National Semiconductor Superfund Site, the Monolithic Memories Superfund Site, and the Intersil/Siemens Superfund Site.

The City of Sunnyvale is expected to continue to coordinate with EPA on community outreach efforts.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site present a release, or potential threat of release, of a CERCLA hazardous substance threatening to public health, or welfare, or the environment based on the factors set forth in the NCP, 40 CFR § 300.415(b)(2). These factors include:

Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants; [§300.415(b)(2)(i)];

TCE is currently considered to be carcinogenic to humans by EPA. Under the current toxicity assessment, the concentration of TCE in air that is associated with an excess lifetime cancer risk of $1x10^{-6}$ (1 in one million) is 0.48 $\mu g/m^3$ for residential exposure.

According to EPA the non-cancer effects of concern for TCE exposure include effects on the liver, kidneys, immune system, central nervous system, male reproductive system, and developing fetus. Under a residential exposure scenario a non-cancer hazard index of 1 is equal to a TCE exposure concentration of 2 $\mu g/m^3$.

Sampling data in the OOU indicated that vapor intrusion from TCE is occurring, and a completed pathway exists. EPA's Integrated Risk Information System (IRIS) 2011 toxicity assessment concluded that TCE exposure poses potential human health hazards for noncancer toxicity to multiple organs and systems and to the developing fetus, including fetal cardiac malformations. This and other findings in the IRIS assessment of TCE indicates that women in the first trimester of pregnancy are one of the most sensitive populations to TCE inhalation exposure. For fetal cardiac malformations, a specific developmental effect, the critical period for exposure is considered to be the approximate 3-week period in the first trimester of pregnancy during which the heart develops.

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate [§300.415(b)(2)(iv)];

The results of prior indoor air sampling indicate the presence of TCE at the soil air interface and the migration of TCE into indoor air (vapor intrusion). The current expanded indoor air initiative, which includes crawlspace sampling, will indicate whether unacceptable exposures due to vapor intrusion are occurring or may have the potential to occur in the future. Where actual or potential unacceptable exposures are detected, mitigation of this exposure pathway will be appropriate.

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released [§300.415(b)(2)(v)];

The current indoor air evaluation includes multiple rounds of indoor air and preferential pathway sampling, including cold weather sampling events, to evaluate whether higher indoor-outdoor temperature differentials (during the winter heating season) amplify the "stack effect" and result in higher levels of VOCs in indoor air due to vapor intrusion.

The availability of other appropriate Federal or State response mechanisms to respond to the release [§300.415(b)(2)(vii)];

The Regional Board recommended to EPA that site oversight by transferred from the Regional Board to EPA Region 9 because the State does not have the resources to oversee the expanded vapor intrusion investigation at the Site, to fully characterize the extent of vapor intrusion in the OOU, and to conduct and/or oversee mitigation activities, where appropriate.

IV. ENDANGERMENT DETERMINATION

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

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

EPA evaluates indoor air quality by comparing the concentrations of chemicals detected to levels determined by EPA to be protective of human health for long-term and short-term exposure. Within this study area, for cancer causing chemicals, EPA considers levels to be protective if they fall within the *range* of a 1 to 100 in a million increased lifetime cancer risk. The level that falls into the most protective end of the risk range – 1 in a million increased lifetime risk – is what is used as the *screening level* for any particular chemical.

EPA's indoor air *long-term screening level* for TCE is 0.48 $\mu g/m^3$. EPA's *short-term* or *non-cancer screening level* for TCE is 2.0 $\mu g/m^3$. Thus, for TCE, the Superfund protective risk range for residential exposure becomes 0.48 to 2 $\mu g/m^3$.

In general, exposures to media concentrations **below** the protective risk range are not considered to pose a significant or actionable risk; exposures to concentrations **within** the

protective risk range may merit additional consideration or investigation; and exposures to concentrations **above** the protective risk range would warrant implementation of removal mitigation actions on an expedited basis.

Early or interim response actions (mitigation measures) authorized by this Action Memorandum may include, as discussed further below, increasing building pressurization and/or ventilation, sealing potential conduits where vapors may be entering the building, treating indoor air (carbon filtration, air purifiers), and temporarily relocating occupants. Mitigation measures will be based upon site-specific conditions, which will determine the best approach.

Mitigation measures in buildings with slab-on-grade foundations (for example, some school buildings and certain residential units) may include the following steps:

a. Occupants of each residential unit will be offered relocation to a nearby hotel while mitigation systems are installed. This will allow work crews continuous access to residences thereby reducing the costs and the time required to install the mitigation systems.

b. Household items will be moved to provide access for three to four sub-slab monitoring ports to be drilled through the concrete in the corners of each residence.

c. One or more six inch diameter concrete cores will be advanced through the slab, near the middle of the residence, usually in a closet.

d. Any sub-slab material that can be removed by hand through the six inch holes will be pulled out to optimize the extent of vacuum achieved at each hole.

e. Four inch PVC pipe will be grouted into each hole and then plumbed to carry the pipe out the side of the building to an in-line Fantech 220 radon mitigation fan (or one similar), and to an exhaust riser well above the roof line.

f. Soffits may be constructed to conceal the pipe runs behind painted and textured drywall.

g. The fans will be energized on the existing electrical service to the residence, or, where necessary, new electrical service (for example, a sub-panel) will be provided.

h. After installation of the systems, sub-slab pressure measurements will be obtained at the pressure monitoring ports in each residence to confirm the extent and

strength (minimum of 10 Pascal of vacuum at each point) of the vacuum field created by the system.

Mitigation measures in buildings with crawlspace foundations (for example, some school buildings and certain single-family residences and duplexes) may include the following steps:

a. Occupants of each residential unit will be offered relocation to a nearby hotel while mitigation systems are installed. This will allow work crews continuous access to residences thereby reducing the costs and the time required to install the mitigation systems.

b. Subject to the safety and adequacy of access, a suitable plastic membrane will be installed to cover the exposed soils under the residence.

c. Four inch PVC pipe will be placed through the membrane, sealed to the membrane at the point of entrance through the membrane, and then plumbed to carry the pipe out the side of the building to an in-line Fantech 220 radon mitigation fan (or one similar) and to an exhaust riser well above the roof line.

d. The fans will be energized on the existing electrical service to the residence, or, where necessary, new electrical service (for example, a sub-panel) will be provided.

Following mitigation system installation, confirmation indoor air sampling will be conducted to demonstrate the success of the mitigation system. Ambient (outdoor) air samples will also be collected and analyzed using the same methods as indoor air.

A building-specific Operations, Maintenance and Monitoring Plan (OM&M Plan) will be prepared and submitted to each occupant and property owner (where different) for their approval, which will include procedures for ongoing maintenance and periodic monitoring to confirm continued operation of the system.

Additionally, EPA will work with residents to repair response-related damage to floors and foundations disturbed by site activities (for example, by providing residents opportunities to choose flooring types and designs, such as carpeting, tile, wood, etc.).

2. Community Relations

EPA will continue to coordinate with the City of Sunnyvale and the school administrations on community outreach activities at the Site.

3. Contribution to Remedial Performance

The response actions proposed in this Action Memorandum are designed to mitigate the threats to human health and the environment posed by the Site. The actions taken at the Site would be consistent with the long-term remedy and would not impede any future responses or changes to the larger remedy to control the source and reduce the extent of the contamination.

4. Description of Alternative Technologies

Alternative technologies are not considered for the proposed response action.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

Section 300.415(j) of the NCP provides that removal actions must attain ARARs to the extent practicable, considering the exigencies of the situation.

Section 300.5 of the NCP defines applicable requirements as cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site.

Section 300.5 of the NCP defines relevant and appropriate requirements as cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site and are well-suited to the particular site.

Only substantive requirements of the environmental or facility siting laws can be ARARs. Administrative requirements, such as consultation with administrative agencies, securing of permits, reporting, and record keeping are not ARARs. This removal action will, to the extent practicable considering the exigencies of the situation, attain ARARs under federal environmental, state environmental, or facility siting laws.

State of California ARARs

State of California's San Francisco Bay Area Air Quality Management District
8-47-301 Emission Control Requirement, Specific Compounds

Any air stripping and soil vapor extraction operations which emit benzene, vinyl chloride, perchoroethylene, methylene chloride and/or trichloroethylene shall be vented to a control device which reduces emissions to the atmosphere by at least 90 percent by weight.

Federal ARARs – Action-Specific:

40 CFR Part 262
Standards Applicable to Generators of Hazardous Waste

40 CFR Part 264
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Hazardous Waste Regulations – RCRA Subtitle C

6. Other Requirements

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)
42 U.S.C. 9621(d)(3), CERCLA Off-Site Disposal Rule, 40 CFR 300.440,
OSWER Directive 9347.3-BFS

CERCLA waste transferred off-site may only be placed in a facility that operates in compliance with the Resource Conservation and Recovery Act (RCRA). The facility to which excavated soil and any other hazardous wastes will be sent must be among the list of approved receiving facilities pursuant to RCRA.

U.S. Department of Transportation (DOT) Hazardous Material Transportation Rules
22 CCR 66262.20, 66262.22, and 66262.23; 22 CCR 66262.30 through 262.33
Off-site transportation of hazardous materials will be governed by U.S. DOT regulations. The substantive provisions of the regulations apply to management of hazardous materials onsite.

29 CFR Parts 1910, 1926, and 1904
OSHA Health and Safety Regulations

7. Project Schedule

Indoor air sampling began in January 2015 and is currently ongoing, pending the access request process with affected residents and property owners.

The duration of any necessary vapor intrusion mitigation removal activities is not expected to exceed six months from the time they begin, weather permitting.

B. Estimated Costs

The basis for costs are direct experience at other sites in Region 9, using existing contracts in place.

COST CATEGORY		CEILING
REGIONAL REMOVAL ALLOWANCE COSTS[6]:		
ERRS[7] Cleanup Contractor		$500,000
Interagency Agreement		$0
OTHER EXTRAMURAL COSTS NOT FUNDED FROM THE REGIONAL ALLOWANCE:		
START[8] Contractor		$900,000
Extramural Subtotal		$1,400,000
Extramural Contingency	20%	$280,000
TOTAL, REMOVAL ACTION CEILING		$1,680,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Given the Site conditions, the nature of hazardous substances documented on-site, and the potential exposure pathways to on-site and visiting populations described above, actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response actions selected in this memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues with the Site identified at this time.

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[6] This cost will be driven by the selected option(s). Should longer term options need to be implemented, additional funding may be required.
[7] ERRS = Emergency and Rapid Response Services
[8] START = Superfund Technical Assessment and Response Team

VIII. ENFORCEMENT ... For Internal Distribution Only

The Enforcement Strategy is included in a separate Enforcement Memo.

The total EPA costs for this removal action based on full-time accounting practices that will be eligible for cost recovery are estimated to be $ 1,680,000 (extramural costs) + $ 50,000 (EPA intramural costs) = $ 1,730,000 X 1.33 (regional indirect rate) = **$ 2,300,900**[9].

IX. RECOMMENDATION

This decision document represents the selected removal action for the Triple Site in Sunnyvale, Santa Clara County, California. The proposed response action was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site. The removal project ceiling of $ 1,680,000 is being requested at this time to allow EPA to implement the selected actions.

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal action due to the following:

Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants [§300.415(b)(2)(i)];

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate [§300.415(b)(2)(iv)];

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released [§300.415(b)(2)(v)]; and

The availability of other appropriate Federal or State response mechanisms to respond to the release [§300.415(b)(2)(vii)].

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[9] Direct Costs include direct extramural costs [$ 1,680,000] and direct intramural costs [$ 50,000]. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site specific costs [33% x $ 1,730,000], consistent with the full accounting methodology effective October 2, 2000. These estimates do not include pre-judgement interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

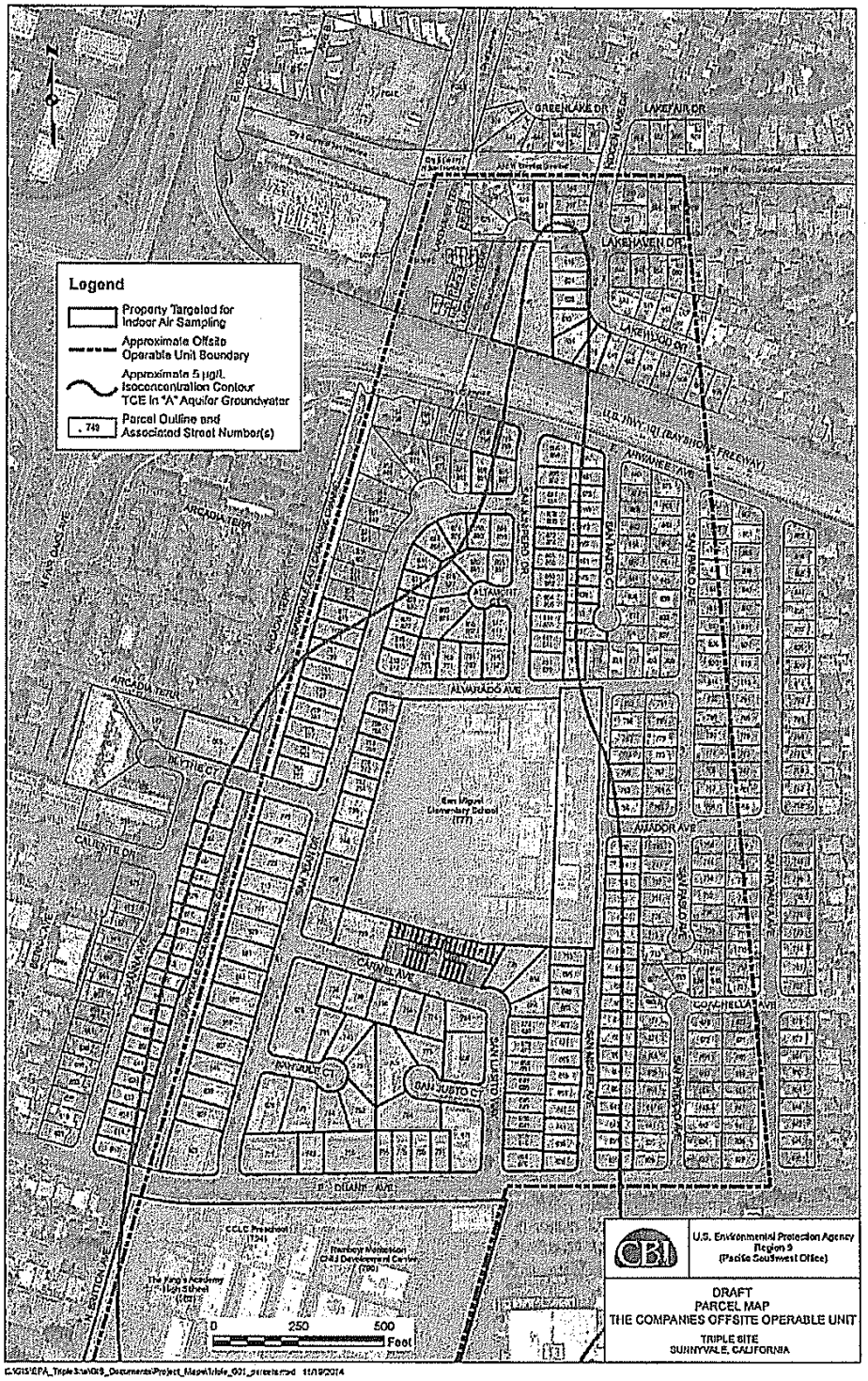
Because conditions at the Site meet the NCP criteria for a time-critical removal, I recommend that you approve the removal action proposed in this memorandum.

APPROVAL: _____ DATE: 2/18/15
John Lyons, Acting Assistant Director
Superfund Division

DISAPPROVAL: _____ DATE: _____
John Lyons, Assistant Director
Superfund Division

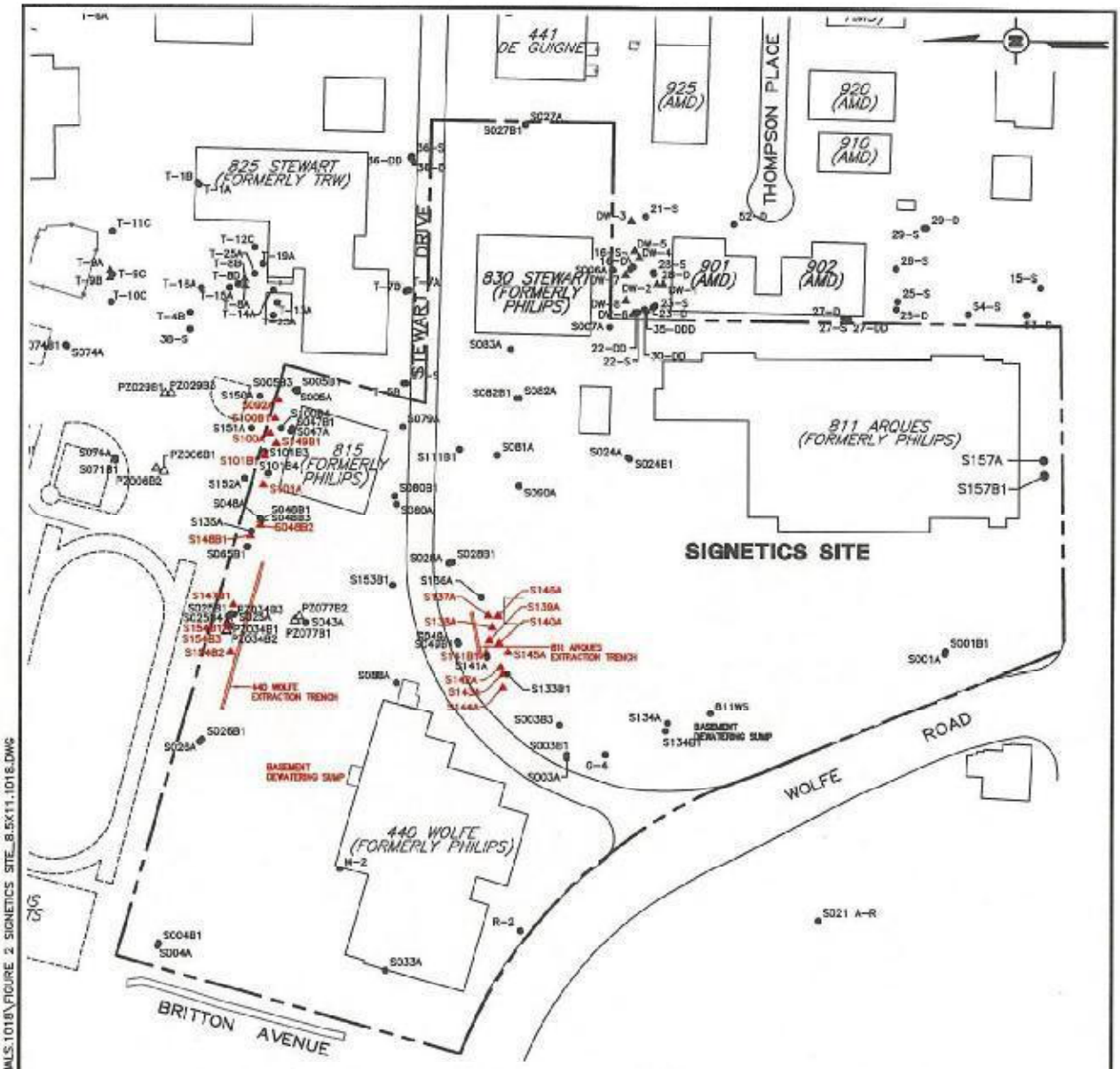
Attachment:

Site Map



C:\GIS\EPA_TripleSite\GIS_Documents\Project_Maps\Triple_001_parcelsmxd 11/19/2014

Appendix B - Site Map



SITE PLAN
SIGNETICS SITE
SUNNYVALE, CALIFORNIA

PREPARED FOR

PHILIPS SEMICONDUCTORS

LEGEND:

- SIGNETICS SITE
- MONITORING WELL
- EXTRACTION WELL
- PIEZOMETER

REFERENCES:

1. BASE MAP FROM KIER AND WRIGHT, NOVEMBER 1997.
2. EMCON DRAWING NO. EXGWE-A, FEBRUARY 1998.

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
0	03 OCT 18	ISSUED FOR USE	AK	NJ	NJ

Locus TECHNOLOGIES

0 125 250 FEET
SCALE: 1" = 250'

DRAWING NO. 27-006-E284

FIGURE 2

FILE: Z:\LOCUS TEC\PHILIPS SUNNYVALE\ORIGINALS\2018\ORIGINALS.1018\FIGURE 2 SIGNETICS SITE_8.5X11.1018.DWG

Appendix C: Statement of Work

Appendix C to Administrative Settlement Agreement and Order on Consent for Focused Feasibility Study and Removal Action

Signetics Site
Triple Site
Sunnyvale, California
Philips Semiconductors, Inc.

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I. Introduction

This Statement of Work (SOW) is incorporated into the Administrative Settlement Agreement and Order on Consent for Focused Feasibility Study and Removal Action (Settlement) at the Signetics Site (Signetics Site or the Site), part of the Triple Site in Sunnyvale, California.

This SOW describes the Work required to conduct a Focused Feasibility Study (FFS), Removal Site Evaluation (RSE), and any necessary removal action, including: the evaluation of existing Site data; the identification, collection, and evaluation of updated Site data; the identification of preliminary remedial action objectives (RAOs) for groundwater; the identification and evaluation of potential remedial alternatives via a Treatability Study (TS) to meet the identified RAOs; the development of a draft FFS; and an RSE of vapor intrusion (VI) to indoor air and implementation of any mitigation measures determined to be necessary.

II. General Requirements

A. Technical Meetings

Upon EPA's request, Respondent shall participate in and present at periodic technical meetings to discuss planning and implementation of the FFS and removal action. In addition to discussion of the technical aspects of the Work, topics shall include anticipated problems or new issues.

B. Progress Reports

During the preparation and implementation of the FFS, Progress Reports shall be submitted to EPA by the tenth (10th) day of each quarter (October, January, April, July), including:

1) Description of the actions that have been taken to comply with the SOW and the Settlement;

2) Description of significant developments since submittal of the last Progress Report;

3) Summary and tabulation of validated results of sampling, tests, and all other data obtained or generated by or on behalf of Respondent with respect to the Site and/or the implementation of the Settlement (unless this data is otherwise made available through online data sharing tools);

4) Description of the activities planned for the next quarter and associated schedules; and

5) Description of issues encountered in complying with the requirements of the Settlement and any anticipated issues, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated issues or delays.

C. Community Involvement

Community involvement will be conducted in accordance with EPA guidance and the NCP.

If requested by EPA, Respondent shall participate in community involvement activities, which may include:

1) the preparation of information regarding the Work for dissemination to the public, with consideration given to appropriate media and/or Internet notification;

2) the preparation and implementation of building-specific communications to ensure building owners and occupants are adequately informed of and have an opportunity to discuss planned sampling activities, sampling results, and risk management measures, including data tables and figures as needed; and

3) preparing for public meetings or meetings with stakeholders that may be held or sponsored by EPA to explain activities at or relating to the Site.

Respondent's support of EPA's community involvement activities may include providing online access to final submissions and updates to final submissions.

All community involvement activities conducted by Respondent at EPA's request are subject to EPA's oversight. Upon EPA's request, Respondent shall make all final deliverables available on a website that is accessible to the public. Upon EPA's request, Respondent shall establish a community information repository at or near the Site to house one copy of the administrative record.

Respondent has designated J. Wesley Hawthorne of Locus Technologies as the Community Involvement Coordinator ("CI Coordinator") for this project. Respondent may modify the CI Coordinator with written notice to EPA. Respondent may hire a contractor for this purpose, if necessary. Respondent's notice shall include the name, title, and qualifications of the Respondent's CI Coordinator. Respondent's CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

D. Off-Site Shipments

Respondent may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if Respondent complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent will be deemed to be in compliance with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440, regarding a shipment if Respondent obtains a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

Respondent may ship waste material from the Site to an out-of-state waste management facility only if, prior to any shipment, it provides written notice to the appropriate state environmental official in the receiving facility's state and to EPA's Project Coordinator. This notice requirement shall not apply to any off-Site shipments when the total quantity of each such shipment will not exceed ten cubic yards.

The written notice shall include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Respondent shall also notify the state environmental official referenced above and EPA's Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Respondent shall provide the written notice after the award of the contract for the Work and before the waste material is shipped.

Respondent may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's "Guide to Management of Investigation Derived Waste," OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the SOW. Wastes shipped off-Site to a laboratory for characterization, and Resource Conservation and Recovery Act (RCRA) hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

E. Certifications

Deliverables submitted to EPA pursuant to the SOW shall include the following certification signed by a responsible corporate official of a Respondent or Respondent's Project Coordinator: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F. Document and Response to Comments Tracking System

When resubmitting any deliverable where EPA has made comments, Respondent shall prepare and submit a response to comment letter, submitted to EPA along with revised deliverables if appropriate. The response to comment letter shall address each comment and state where the comment has been addressed in the deliverable re-submittal. After the response to comment letter has been issued, if EPA provides additional comments, Respondent will insert into the response to comment letter under each initial comment. These letters will accompany each deliverable resubmittal, and will be updated as needed to include the comments and responses to date on that deliverable. The response to comment letters shall remain as an attachment to the deliverable, but may be removed for copies of final deliverables that are intended to be provided directly to the public.

G. Notification of Results Exceeding Short-Term TCE Screening Levels

Respondent shall submit to EPA, within twenty-four (24) to forty-eight (48) hours of receipt from the laboratory, any results exceeding the applicable EPA short-term commercial screening levels for trichloroethene (TCE) based on building occupancy (hours of daily use) in indoor air for an occupied space.

III. Deliverables – Focused Feasibility Study

A. Focused Feasibility Study Work Plan (FFS Work Plan)

Respondent shall prepare and submit to EPA for approval a FFS Work Plan for groundwater. The FFS Work Plan shall include the items listed in (1) through (6), below.

The FFS shall determine and evaluate (based on treatability testing and existing literature review) alternatives for remedial action to prevent, mitigate, or otherwise respond to or remedy the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site. The alternatives evaluated shall include, but shall not be limited to, the range of alternatives described in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430(e), and shall include remedial actions that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In evaluating the alternatives, Respondent shall address the factors required to be considered by Section 121 of CERCLA, 42 U.S.C. § 9621, and 40 C.F.R. § 300.430(e).

1) ***The FFS Work Plan shall include:***

a) Procedures for coordinating with EPA to define the specific objectives and overall project scope of the FFS;

b) The FFS objectives and overall project scope; and

c) Frequency of meetings (e.g., milestone based) with EPA to discuss key project planning decisions and special concerns associated with the Signetics Site.

2) ***The FFS Work Plan shall include identification of data needs and data quality objectives (DQOs), and initial data evaluation, including:***

a) Evaluation and summary of existing Site background information and data to assist in planning the specific scope of the FFS, identifying data needs and DQOs, supporting the development and evaluation of remedial alternatives, including:

1. Data gathered for the historic Remedial Investigation (RI) for the 1991 Record of Decision (ROD), including summary of existing Volatile Organic Compound (VOC) data collected and other relevant physical and chemical characteristics of groundwater at the Signetics Site and Triple Site, including the distribution of VOCs among environmental media at the Signetics Site and Triple Site, water level contours, groundwater flow pathways, and aquifer properties;

2. Data collected during operation and monitoring of the Triple Site groundwater remedies through the present;

3. Data generated during FFS-related activities at the TRW Microwave and AMD 901/902 Thompson Place Sites, to the extent relevant;

4. Description of other previous and ongoing responses conducted at the Signetics Site; and

5. Data collected during various building-specific vapor intrusion evaluations.

b) Procedures for updating the conceptual site model, as necessary, to address any new information regarding the nature, extent, and volume of contamination, including the subsurface-to-indoor air vapor intrusion pathway, and contaminant fate and transport conditions;

c) Defining expected performance requirements of treatment alternatives, including consideration of:

1. Site physical characteristics;

2. Physical and chemical characteristics of groundwater contamination; and

3. Volume of contamination and extent of migration.

d) Development of strategies for sampling and analysis if additional data needs are identified, as well as establishment of DQOs for collection of necessary additional data; and

e) Submittal for EPA approval DQOs that address all the various types of data which may be collected during the FFS, including chemical (analytical) data and physical data such as, but not limited to, groundwater level measurements, lithologic data, borehole geophysical survey data, aquifer test data, and geodetic survey data for sample locations.

3) ***The FFS Work Plan shall include evaluation of groundwater flow and water quality conditions, including:***

a) Evaluation of engineering and hydrogeologic data (such as pumping characteristics, water level contours, and aquifer properties) for the projection of contaminant fate and transport to the extent required for remediation;

b) Review of existing groundwater modeling and associated data to evaluate current hydraulic containment in the Signetics Site and anticipated performance of various remedial alternatives;

c) To the extent necessary to implement remediation, perform appropriate testing of the aquifer or evaluation of the subsurface to identify any important preferred pathways of contaminant migration to evaluate remedial alternatives in addition or complementary to existing remedies;

d) Preparation and submittal for EPA approval of an Evaluation of Groundwater Containment Technical Memorandum (TM), which will evaluate the status of current groundwater extraction and groundwater plume boundaries to determine if the plume is effectively captured. This TM shall include the following:

1. Summary of groundwater evaluation;

2. Hydrogeological evaluation of capture zones from current extraction systems;

3. Evaluation of groundwater VOC plume boundaries and associated potential uncertainties based on available data; and

4. Description of activities performed to evaluate the effectiveness of hydraulic containment of VOC contamination by the existing groundwater extraction and treatment system.

In addition, depending upon the findings of the above analyses, the TM may include the following:

5. Development and calibration of a groundwater flow model over a wide-range of hydrogeologic conditions; and

6. The capability to simulate transient conditions and hydraulic control in three dimensions.

e) As appropriate, preparation and submittal to EPA for approval of a justification of sufficiency of existing groundwater models to evaluate capture of VOCs, if Respondent elects not to develop new or supplement existing groundwater models.

4) The FFS Work Plan shall include development of RAOs and Potential Remedial Alternatives, including:

a) Development of preliminary RAOs once the existing data have been evaluated and documentation of RAOs in a TM submitted to EPA for approval;

b) Following EPA approval of the RAOs, identification of a preliminary range of broadly defined potential remedial action alternatives and/or general response actions that meet the RAOs;

c) Identification of technology types applicable to each general response action, and subsequent identification and evaluation of process options for each technology type, separately or in combination, to satisfy the RAOs;

d) Target areas for treatment and/or containment based on evaluation of the nature and extent of VOC contamination and evaluation of groundwater flow conditions; and

e) Modifications to the RAOs, documented in a TM that will be subject to EPA review and approval.

5) The FFS Work Plan shall include procedures for evaluation and development of treatability studies, if additional studies are deemed to be necessary as part of the Work.

6) The FFS Work Plan shall identify potential ARARS, including:

a) Identification of potential chemical-specific and location-specific state and federal ARARs during the scoping phase to assist in:

1. Identification and refinement of RAOs; and

2. Identification of remedial alternatives required to address site conditions;

b) Determining the presence of Resource Conservation and Recovery Act (RCRA) regulated hazardous waste; and

c) Identification of any more stringent state ARARs.

B. Sampling and Analysis Plan

Respondent shall submit a Sampling and Analysis Plan (SAP) for all sampling pursuant to the SOW to EPA for approval. The SAP shall consist of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP) that is consistent with the requirements of the Settlement, this SOW, the NCP and applicable guidance documents. Upon its approval by EPA, the SAP shall be incorporated into and become enforceable under the Settlement.

C. Health and Safety Plan

Respondent shall submit for EPA review and comment a Health and Safety Plan (HASP) that ensures the protection of health and safety during performance of work under the Settlement. This plan shall be prepared in accordance with all applicable health and safety regulations, including Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910.

D. Treatability Studies

Respondent submitted a Treatability Study Work Plan for Bioremediation on October 18, 2016 (2016 TS Work Plan), which EPA approved on November 1, 2016. The 2016 TS Work Plan was implemented between November 2016 and November 2017, after which Respondent submitted an evaluation report on April 10, 2018, with recommendations for expansion. If additional treatability studies are determined to be necessary after evaluation of the current treatability study, Respondent shall conduct treatability studies for other potential remedy(ies). Respondent shall provide EPA with the following deliverables for review and approval:

1) Identification of Candidate Treatment Technologies Memorandum

a) Identification of candidate technologies for a treatability studies program, covering the range of technologies required for alternatives analysis, and submittal to EPA of an Identification of Candidate Technologies Memorandum; and

b) Determination of the specific data requirements for the testing program and refinement during data evaluation and the development and screening of remedial alternatives.

2) Treatability Test Work Plan (TTWP)

a) Determination of the type of treatability evaluation(s) to use (i.e., bench scale or pilot scale or both), including defining the objectives, procedures and methodologies, and remedial technology and operating conditions being tested;

b) Specific data requirements for the testing program, including any necessary permits or permissions (i.e., for field or pilot scale tests or off-site testing);

c) DQOs;

d) Any necessary updates to the HASP and/or SAP; and

e) Schedule for the treatability testing program and for reporting results of the same.

3) Treatability Study Evaluation Report (TS Evaluation Report)

Results of any treatability testing performed will be presented in the TS Evaluation Report, to include the following:

a) Analysis and interpretation of the testing results; and

b) Evaluation of each tested technology's effectiveness, full-scale implementability, estimated cost for full-scale implementation, actual results of the treatability testing as compared with predicted results, any deviations from the initial TTWP procedures and potential barriers to or limitations on effectiveness of full-scale implementation.

E. Draft FFS Report

Respondent shall submit to EPA a draft FFS Report for review and approval. Respondent shall refer to Table 6-5 of the RI/FS Guidance for report content and format. The draft FFS Report as amended, and the administrative record, shall provide the basis for the proposed plan under Sections 113(k) and 117(a) of CERCLA, 42 U.S.C. §§ 9613(k) and 9617(a), by EPA, and shall document the development and analysis of remedial alternatives.

1) Development and Screening of Alternatives

The FFS Report shall include an appropriate range of remedial options that will be evaluated through the development and screening of alternatives, as provided in this SOW and the FFS Work Plan, including the following:

a) RAOs, including Engineering Controls and Institutional Controls (ICs), as necessary; and

b) Remedial action alternatives and the screening process.

2) Remedial Alternatives Analysis

The FFS Report shall include a detailed analysis of remedial alternatives as follows:

a) Individual Analysis of Alternatives. Respondent shall assess the individual alternatives against each of the nine evaluation criteria provided below, as described in the NCP:

- Overall protection of human health and the environment;
- Compliance with ARARs;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and
- Community acceptance.

b) Comparative Analysis of Alternatives. Respondent shall conduct a comparative analysis of alternatives to evaluate the relative performance of each alternative in relation to the nine evaluation criteria and prepare a summary report. If ICs are proposed as part of any alternative, either as a standalone remedy or as a component of an alternate remedy, Respondent shall include an analysis of the ICs in accordance with the nine evaluation criteria.

c) If ICs are identified as a selected remedial action, Respondent shall (i) describe the restrictions needed on land, water, or other resources and their relationship to the RAOs; (ii) determine the specific types of ICs that can be used to address and implement the land, water, or other resource use restrictions; (iii) investigate when the ICs need to be implemented and how long they shall remain in place; and (iv) research, discuss, and document any agreement or other arrangements with the proper entities (e.g., state, local government, local landowners, conservation organizations, Respondent) on who will be responsible for implementing, maintaining, and enforcing the ICs. Respondent shall also evaluate the ICs against the nine evaluation criteria outlined in the NCP (40 C.F.R. § 300.430(e)(9)(iii)) for CERCLA cleanups, including but not limited to costs to implement, maintain, and/or enforce the ICs.

IV. Deliverables – RSE and any Necessary Removal Action

A. RSE and any Necessary Removal Action Work Plan (Vapor Work Plan)

Respondent shall prepare and submit to EPA for approval an Indoor Air/Vapor Intrusion RSE and any Necessary Removal Action Work Plan (Vapor Work Plan). The Vapor Work Plan shall cover all buildings in the Signetics Site and shall include the items listed in (1) through (3), below.

Vapor Work Plan activities regarding TCE vapor intrusion into indoor air may include, but are not limited to, the following: coordination with EPA in implementation of property owner outreach activities; assessment of TCE levels in indoor air, outdoor air, pathway air and soil vapor; increasing building pressurization and/or ventilation; sealing of conduits where vapors may be entering the building; treatment of indoor air (for example, with carbon filtration or indoor air purifiers); installation of passive barriers and/or venting systems; installation, operation and maintenance of sub-slab and sub-membrane depressurization systems; confirmatory sampling; working with property owners to return the property to conditions prior to response-related activities; and temporary relocation of occupants, if necessary. Mitigation measures for vapor intrusion may be implemented for buildings prior to sampling, if available information suggests that it may be warranted.

1) ***The Vapor Work Plan shall include procedures for implementation of building surveys at each building, including:***

a) Collection of reasonably available and pertinent information to develop building-specific Work Plan Addenda, which may include analyses of sampling or survey data previously collected at and near buildings, including groundwater, soil, soil vapor, sub-slab soil vapor, indoor air, pathway air, and outdoor air, and mitigation system information (where such are present);

b) Collection of historical background information;

c) Identification of available and relevant building information, including physical features such as foundation type (e.g., basement, slab-on-grade, or crawlspace), foundation condition, building size, ceiling heights, and building use zones (e.g., warehouse, office space), to determine whether there are building features that could influence vapor intrusion;

d) Determination of the nature of building occupancy, including general building use (e.g., manufacturing, office space, retail), and available information regarding days/hours of occupancy by all occupants;

e) Identification of potential preferential pathways for soil vapor to enter indoor air (e.g., elevator shafts, utility conduits/tunnels, vaults, tanks, sumps, areas/rooms where utilities penetrate a slab foundation, piping and utility corridors, foundation gaps, construction joints and floor drains);

f) Assessments of building ventilation including:

1. Evaluation of passive ventilation, including windows, doors, and any large openings that are used (such as roll-up doors);

2. Identification of areas that are not ventilated where vapors may enter the building and accumulate; and

3. Evaluation of existing information on the heating, ventilation and air

conditioning (HVAC) system(s) and general operation, including number of distinct ventilation zones, ventilation cycles (daily, weekly, and seasonally), make-up air, and temperature settings; and

4. Conducting a chemical inventory of VOC containing products inside the building, as appropriate, with a specific focus on products containing the site contaminants of concern (COCs).

g) Development of sampling strategies, as necessary, if products containing site COCs are identified, including communications with building owners and tenants to identify and remove confounding indoor sources of site COCs, as appropriate, and plans for managing indoor sources to avoid sample interference; and

h) Evaluation of the specific chemical manufacturing or usage activities that take place within the building, as appropriate, and description of them in a Building-Specific Vapor Work Plan Addenda or its equivalent, to target sampling locations away from the chemical usage areas or if indoor sources in these areas could obscure vapor intrusion pathways and/or interfere with analytical data.

2) ***The Vapor Work Plan shall include procedures for evaluation of commercial-type or non-residential-type buildings, including:***

a) Conducting rounds of sampling, including HVAC-on and -off testing, if possible, to:

1. Evaluate the potential for subsurface vapor intrusion into buildings in the absence of the indoor air ventilation system;

2. Understand the full range of possible exposure scenarios; and

3. Identify HVAC as a possible interim or short-term VI remedy for certain buildings.

b) Identification of short-term mitigation activities, such as:

1. Conduit sealing;

2. Operation of indoor air purifiers; and

3. Ventilation optimization; and

c) Consideration of preemptive mitigation for buildings where available lines of evidence suggest the potential for vapor intrusion concerns.

3) ***The Vapor Work Plan shall include a SAP, including a Field Sampling Plan and Quality Assurance Project Plan for indoor air sample collection, specifically including for each building to be tested:***

a) Procedures for identification of appropriate indoor air sampling locations targeting areas/rooms with potential preferential pathways, as well as breathing zone samples in areas generally representative of typical exposure;

b) Procedures for identification of ambient outdoor air sampling locations to represent the potential contribution of outdoor contaminants to indoor air concentrations;

c) As applicable, sampling and analysis of indoor air, pathway air, sub-slab air, soil vapor, and outdoor air at appropriate locations, including methodology (such as passive samples, grab samples, real-time field screening), DQOs and indicators;

d) Selecting duration of sample collection (e.g., grab, syringe, 8-hour, 24-hour, days to weeks), identifying conditions for sampling (e.g., ventilation when sampling occupied or unoccupied buildings), and determination of equipment to be used in sampling (e.g., evacuated canisters, passive absorption devices) as appropriate to the VI potential of concern;

e) To the extent feasible with current building operations, sampling rounds with and without ventilation operating (e.g., both the ventilation and cooling functions of the HVAC off, or with manual outdoor air intakes open and closed) at buildings with significant ventilation (including HVAC systems);

f) To the extent feasible with current building operations, HVAC-off sampling with a sampling duration of 36 hours or the maximum duration allowed by current building operations, following shut-down of the building ventilation systems (no outdoor air intakes into the building) and continuing while HVAC systems remain off;

g) Providing adequate notice to building management and occupants about the testing schedule and timeframe for ventilation system shut-down;

h) To the extent feasible, removal of potential indoor sources of site COCs that could interfere with analysis at least 24 hours prior to collection indoor air samples;

i) Surveying each building tested on the day of sampling to identify current conditions, including the ventilation system status (if present), occupancy, chemical presences and usage, and any other conditions that may impact the representativeness of the samples; and

j) Indoor air sampling events, including during the winter heating season, to:

    1. Address the concern that where seasonal variation has been observed, the potential for vapor intrusion is generally higher during colder periods of the year in winter; and

2. Assist in assessing the potential variability of indoor air contaminant concentrations during conditions when the potential for vapor intrusion may be higher.

B. Building-Specific Vapor Work Plan Addenda

Respondent shall prepare and submit to EPA for approval Building-Specific Vapor Work Plan Addenda, including, as appropriate, a description of the chemical inventory, building activities, building occupancy characteristics, building-specific CSM, ventilation assessment and data gap evaluation. The Building-Specific Vapor Work Plan Addenda shall also include specific sampling locations based upon the previously conducted building surveys, an evaluation of data gaps, and include short-term and long-term response action levels and response timeframes. Upon approval, Respondent shall commence indoor sample collection activities in accordance with the approved Building-Specific Vapor Work Plan Addenda.

C. Implementation of Risk Management Activities

Upon completion of Indoor Air Sample Collection, Respondent shall implement risk management activities, as described in the Vapor Work Plan approved by EPA. Risk Management Activities may include:

1) Consideration and prompt implementation of interim mitigation activities in the event of finding a confirmed vapor intrusion occurrence of TCE posing a potential short-term health threat (evidenced by the measurement of indoor air concentrations above a Hazard Quotient [HQ] of 1 or 9 micrograms per cubic meter ($\mu g/m^3$) for an 8-hour commercial workday or 7 $\mu g/m^3$ for a 10-hour commercial workday) while long-term remedial options are considered, with the effectiveness of mitigation measures (defined as a reduction of the TCE indoor air concentrations to below the HQ=1 level) confirmed promptly, or within a few weeks; and

2) Development and implementation of mitigation measures immediately in the event of finding a confirmed vapor intrusion occurrence of TCE posing a potential short-term health threat above an HQ of 3 (27 $\mu g/m^3$ for an 8-hour commercial workday or 21 $\mu g/m^3$ for a 10-hour commercial workday) while long-term remedial options are considered, with the effectiveness of mitigation measures confirmed within a few days.

D. Report on Evaluation of Indoor Air and Recommendations

Upon completion of the implementation of the Vapor Work Plan, including Building-Specific Work Plan Addenda, Respondent shall prepare and submit to EPA for approval, a Report on Evaluation of Indoor Air and Recommendations, which will summarize the findings and propose mitigation measures as needed. Upon approval, if applicable, Respondent shall commence implementation of any proposed mitigation measures described in the Report on Evaluation of Indoor Air and Recommendations. The Report on Evaluation of Indoor Air and Recommendations shall include the following:

1) Evaluation of data using the context of the multiple-lines-of-evidence approach, taking into consideration contaminant concentrations in outdoor air, indoor air, unoccupied areas (e.g., including crawlspace air, basement air and pathway air), subsurface soil vapor (including any evidence of a concentration gradient), and groundwater;

2) Data validation to ensure acceptable quality of the data, defensibility of the data, and verification that chain-of-custody requirements have been met;

3) Review of data for usability for its intended purpose, and preparation of a report of data validation and usability to EPA (or as a component of the Report on Evaluation of Indoor Air);

4) Comparison of measured indoor air contaminant concentration sampling results to background long-term and, where appropriate, short-term health-based screening levels;

5) Screening site COCs, other than TCE short-term impacts, based on EPA's RSLs and/or other appropriate screening levels);

6) Consideration of possible contribution from potential indoor sources (e.g., consumer products, building use and outdoor sources;

7) Evaluation of indoor air data in consideration of local, regional and ambient outdoor air data;

8) Evaluation of data considering the information gathered regarding the specific building in which it was obtained;

9) Where data evaluation indicates that VI is occurring in a building at levels indicating mitigation of that building is necessary, determination of appropriate planned mitigation measures based on the levels found and corresponding risks to health, the building occupant(s), and other building particulars;

10) Where indoor air concentrations attributed to VI exceed 5 micrograms per cubic meter in occupied areas, consideration of, as appropriate, preemptive mitigation, development and implementation of building and/or procedural alterations, monitoring plans and institutional controls;

11) Recommendations for any mitigation measures at buildings where indoor air levels indicate VI occurring above short-term or long-term levels of health concern, may include, but are not limited to, any of these items or a combination of these items:

    a) Increasing outdoor air infiltration and instituting positive pressure ventilation (including identification of existing HVAC systems and operational parameters, system overhauls repairs and upgrades, and preparing O&M plans to EPA property owners and tenants);

b) Installing and operating indoor air purifiers;

c) Sealing preferential pathways for soil gas entering the building;

d) Installing vapor barriers;

e) Installing and operating sub-slab or sub-membrane depressurization systems (like radon mitigation systems); and/or

f) Installing and operating soil vapor extraction systems.

12) Building-specific communications plans to ensure building owners and occupants are adequately informed of sampling results and planned risk management measures.

E. Building-Specific Mitigation Completion Reports

If applicable, based on the RSE, Respondent shall prepare and submit to EPA for approval a Building-Specific Mitigation Completion Report for each building. The Building-Specific Mitigation Completion Report shall include requirements for any post-removal site controls which shall detail the building-specific risk management activities and mitigation measures developed and implemented and which should include, but not be limited to, the following:

1) Operation and Maintenance Plans for mitigation systems (if applicable);

2) Required City building/safety permits (if applicable);

3) Occupant Information Sheets; and

4) As-built drawings for the mitigation systems installed.

Upon EPA approval, Respondent shall either conduct post-removal site control activities, or obtain a written commitment from another party to conduct such activities, until such time as Respondent has collected sufficient data to demonstrate that VI mitigation measures, including but not limited to mechanical systems (active sub-slab or sub-membrane depressurization systems, barriers with passive venting systems, HVAC systems, etc.), indoor air purifiers, etc. are no longer necessary to maintain risk-based concentrations of TCE in indoor air based on EPA's health-protective screening levels, and based on this EPA determines that no further post-removal site control is necessary. Respondent shall provide EPA with documentation of post-removal site control commitments.

V. Implementation

Respondent shall implement all approved deliverables in accordance with the approved schedule.

VI. Schedules

All deliverables and tasks required under this SOW shall be submitted or completed by the deadlines or within the time durations listed in the table set forth below. Respondent may submit a proposed revised table for EPA approval. Upon EPA's approval, the revised table supersedes the table set forth below, and any previously-approved table.

DELIVERABLE	DUE DATE (calendar days)
Participation in and Presentation at Technical Meetings, as appropriate.	As appropriate and upon request by EPA, with minimum twenty-one (21) day notice to Respondent
Progress Reports	Submitted to EPA by the tenth (10th) day of the month following the end of each quarter
Notification of Respondent's Community Involvement Coordinator	Within thirty (30) days after the Effective Date
Preparation of Community Involvement Materials	As necessary, with minimum of thirty (30) days notice to Respondent
Response to Comments Letter	As appropriate and within thirty (30) days of receipt of comments from EPA
Notification to EPA of Results Exceeding Short-Term TCE Screening Levels	Within forty-eight (48) hours of receipt of results from the laboratory
FFS Work Plan for Groundwater	Within ninety (90) days after the Effective Date
Evaluation of Groundwater Containment Technical Memorandum	Within forty-five (45) after EPA's approval of FFS Work Plan
Remedial Action Objectives Technical Memorandum	Within forty-five (45) days after EPA's approval of Groundwater Model Technical Memorandum
Sampling and Analysis Plan for Groundwater FFS - Field Sampling Plan - Quality Assurance Project Plan	Within forty-five (45) days after EPA's approval of Remedial Action Objectives Technical Memorandum
Health and Safety Plan	Within forty-five (45) days after EPA's approval of Remedial Action Objectives Technical Memorandum
Identification of Candidate Treatment Technologies Memorandum (if applicable)	Within thirty (30) days after EPA's approval of FFS Work Plan for Groundwater
Treatability Test Work Plan (if applicable)	Within forty-five (45) days after EPA's approval of the Identification of Candidate Treatment Technologies Memorandum
Treatability Test Work Plan implementation (if applicable)	Commencement within twenty-one (21) days after EPA's approval of the Treatability Test Work Plan
Treatability Study Evaluation Report (if applicable)	Within sixty (60) after completion of Treatability Study activities
Vapor Work Plan	

	Within sixty (60) days after the Effective Date
Vapor Work Plan Implementation	Commencement within twenty-one (21) days after EPA's approval of the Vapor Work Plan
Building-Specific Vapor Work Plan Addenda	Within thirty (30) days each building survey is completed
Indoor Air Sample Collection	Commencement within twenty-one (21) days after EPA's approval of Building-Specific Sampling Plan Addenda
Immediate or Short-Term Mitigation or Other Interim Response Activities, as appropriate	In accordance with the schedule in the Vapor Work Plan or Building-Specific Vapor Work Plan Addendum, or as otherwise approved by EPA
Report on Evaluation of Indoor Air and Recommendations	Within forty-five (45) after EPA's approval of completion of Indoor Air Sample Collection
Implementation of initial or additional Building-Specific Risk Management and Mitigation Measures, Monitoring Plans, and Institutional Controls, as appropriate	Commencement within thirty (30) days after EPA's approval of Report on Evaluation of Indoor Air and Recommendations
Building-Specific Mitigation Completion Reports for each building	Within forty-five (45) days after EPA's approval of completion of Building-Specific Risk Management and Mitigation Measures, Monitoring Plans, and Institutional Controls
Draft Focused Feasibility Study Report, including Appendix on Alternatives Analysis for ICs and Screening	Within sixty (60) days after EPA's approval of the Treatability Study Evaluation Report

VII. References and Guidance Documents

The following list consists of many of the regulations and guidance documents that may apply to the Work.

1. American National Standards Practices for Respiratory Protection. American National Standards Institute Z88.2-1980, March 11, 1981.
2. ARCS Construction Contract Modification Procedures, September 1989, OERR Directive 9355.5-01/FS.
3. CERCLA Compliance with Other Laws Manual, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (DRAFT), OSWER Directive No. 9234.1-01 and -02.
4. Community Relations in Superfund - A Handbook, U.S. EPA, Office of Emergency and Remedial Response, January 1992, OSWER Directive No. 9230.0-3C.
5. A Compendium of Superfund Field Operations Methods, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.
6. Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, U.S. EPA, Office of Solid Waste and Emergency Response, October 1986, OSWER Directive No. 9472.003.

7. Contractor Requirements for the Control and Security of RCRA Confidential Business Information, March 1984.
8. Data Quality Objectives for Remedial Response Activities, U.S. EPA, 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.
9. Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. EPA Region IV, Environmental Services Division, April 1, 1986 (revised periodically).
10. EPA NEIC Policies and Procedures Manual, EPA-330/9-78-001-R, May 1978, revised November 1984.
11. Federal Acquisition Regulation, Washington, DC: U.S. Government Printing Office (revised periodically).
12. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive NO. 9355.3-01.
13. Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.
14. Guidance on Expediting Remedial Design and Remedial Actions, EPA/540/G-90/006, August 1990.
15. 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.
16. Guide for Conducting Treatability Studies Under CERCLA, U.S. EPA, Office of Emergency and Remedial Response, Prepublication version.
17. Guide to Management of Investigation-Derived Wastes, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.
18. Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.
19. Health and Safety Requirements of Employees Employed in Field Activities, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1982, EPA Order No. 1440.2.
20. 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.
21. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.
22. Methods for Evaluating the Attainment of Cleanup Standards: Vol. 1, Soils and Solid Media, February 1989, EPA 23/02-89-042; vol. 2, Ground Water (Jul 1992).
23. National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, Federal Register 40 CFR Part 300, March 8, 1990.
24. NIOSH Manual of Analytical Methods, 2nd edition. Volumes I-VII for the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.
25. Occupational Safety and Health Guidance Manual 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.
26. Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, February 19, 1992, OSWER Directive 9355.7-03.
27. Procedure for Planning and Implementing Off-Site Response Actions, Federal Register, Volume 50, Number 214, November 1985, pages 45933-45937.

28. Procedures for Completion and Deletion of NPL Sites, U.S. EPA, Office of Emergency and Remedial Response, April 1989, OSWER Directive No. 9320.2-3A.
29. 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.
30. Remedial Design and Remedial Action Handbook, U.S. EPA, Office of Emergency and Remedial Response, June 1995, OSWER Directive No. 9355.5-22.
31. Revision of Policy Regarding Superfund Project Assignments, OSWER Directive No. 9242.3-08, December 10, 1991. [Guidance, p. 2-2]
32. Scoping the Remedial Design (Fact Sheet), February 1995, OSWER Publ. 9355-5-21 FS.
33. Standard Operating Safety Guides, U.S. EPA, Office of Emergency and Remedial Response, November 1984.
34. Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.
35. Standards for General Industry, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.
36. Structure and Components of 5-Year Reviews, OSWER Directive No. 9355.7-02, May 23, 1991. [Guidance, p. 3-5]
37. Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, April 1990, EPA/540/G-90/001.
38. Superfund Remedial Design and Remedial Action Guidance, U.S. EPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.0-4A.
39. Superfund Response Action Contracts (Fact Sheet), May 1993, OSWER Publ. 9242.2-08FS.
40. TLVs-Threshold Limit Values and Biological Exposure Indices for 1987-88, American Conference of Governmental Industrial Hygienists.
41. Treatability Studies Under CERCLA, Final. U.S. EPA, Office of Solid Waste and Emergency Response, EPA/540/R-92/071a, October 1992.
42. USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, U.S. EPA, Office of Emergency and Remedial Response, July 1988.
43. USEPA Contract Laboratory Program Statement of Work for Organic Analysis, U.S. EPA, Office of Emergency and Remedial Response, February 1988.
44. User's Guide to the EPA Contract Laboratory Program, U.S. EPA, Sample Management Office, August 1982.
45. Value Engineering (Fact Sheet), U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9355.5-03FS, May 1990.
46. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), U.S. EPA, Office of Solid Waste and Emergency Response, Directive 9285.7-01B, NTIS PB92-963333, December 13, 1991.
47. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, U.S. EPA, Office of Solid Waste and Emergency Response, Directive 9200.1-120, Feb. 6, 2014. http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf
48. Role of Background in the CERCLA Cleanup Program, Directive 9285.6-07P, U.S. EPA, 2002. http://www.epa.gov/oswer/riskassessment/pdf/role.pdf
49. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, U.S. EPA, June 2015, OSWER Publication 9200.2-154.

50. Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches, EPA, 2008. Publication No. EPA/600/R-08/115
51. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, DTSC, October 2011 http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf
52. Vapor Intrusion Mitigation Advisory, Final, Revision 1, DTSC, October 2011 https://dtsc.ca.gov/SiteCleanup/upload/VIMA_Final_Oct_20111.pdf
53. Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology & Regulatory Council, January 2007 http://www.itrcweb.org/Documents/VI-1.pdf
54. Building Air Quality (BAQ) A Guide for Building Owners and Facility Managers, December 1991 at http://www.epa.gov/iaq/largebldgs/baqtoc.html
55. USEPA Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models, EPA/600/R-17/293, September 2017.
56. Greener Cleanups Policy - EPA Region 9, EPA, September 14, 2009.
57. Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A), RAGS, EPA-540-1-89-002, OSWER Directive 9285.7-01A, December 1989.
58. Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), RAGS, EPA-540-R-97-033, OSWER Directive 9285.7-01D, January 1998.
59. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, ERAGS, EPA-540-R-97-006, OSWER Directive 9285.7-25, June 1997.
60. Guidance for Data Useability in Risk Assessment (Part A), Final, OSWER Directive 9285.7-09A, PB 92-963356 (April 1992), available at http://semspub.epa.gov/src/document/11/156756 (Accessed March 2, 2018).
61. Guidance for Quality Assurance Project Plans (QA/G-5), EPA/240/R-02/009, December 2002.
62. EPA Requirements for Quality Assurance Project Plans (QA/R-5), EPA 240/B-01/003, March 2001, reissued May 2006.
63. Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A-900C, March 2005.
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66. Reuse Assessments: A Tool to Implement the Superfund Land Use Directive, OSWER Directive 9355.7-06P, June 2001.
67. Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups, OSWER Directive 9355.0-74FS-P, September 2000.
68. Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER Directive 9355.0-89, November 2010.
69. USEPA Region 9. Letter to Stephen Hill, Chief, Toxics Cleanup Division, California

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70. USEPA on-line Regional Screening Level Calculator, available at http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search.
71. USEPA Groundwater Issue, Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models, Pub. EPA/600/R-17/293, September 2017.