

UNITED STATES DISTRICT COURT
DISTRICT OF PUERTO RICO

UNITED STATES OF AMERICA,

Plaintiff,

v.

Civil Action No. 3:23-cv-01383

HP INC.,
PUERTO RICO INDUSTRIAL
DEVELOPMENT CO.,
WALLACE SILVERSMITHS DE
PUERTO RICO, LTD., and LIFETIME
BRANDS, INC.

Defendants.

**CONSENT DECREE FOR REMEDIAL DESIGN AND REMEDIAL ACTION
AT OPERABLE UNIT ONE OF THE SAN GERMAN GROUNDWATER
CONTAMINATION SITE**

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WHEREAS, the United States of America (“United States”), on behalf of the Administrator of the United States Environmental Protection Agency (“EPA”), filed a complaint in this matter under section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”).

WHEREAS, the San German Groundwater Contamination Superfund Site (“Site”) is an area of contaminated soil and groundwater in the southwestern Puerto Rico town of San German. Volatile organic compounds have been detected above federal maximum contaminant levels in the groundwater at the Site and have been detected in public supply wells formerly used for public drinking water.

WHEREAS, the Site includes the Wallace Lot and the CCL Lot located at an industrial park, known as Retiro Industrial Park, which is owned by the Puerto Rico Industrial Development Company (“PRIDCO”). As set out in the complaint in this matter, the United States alleges that PRIDCO is jointly and severally liable for releases of hazardous substances at the Site.

WHEREAS, PRIDCO currently leases the Wallace Lot to Wallace Silversmiths de Puerto Rico, Ltd., a subsidiary of Lifetime Brands, Inc. As set out in the complaint in this matter, the United States alleges that Wallace Silversmiths de Puerto Rico, Ltd. and Lifetime Brands, Inc. are jointly and severally liable for releases of hazardous substances at the Site.

WHEREAS, HP Inc. is not a tenant at the CCL Lot. PRIDCO leased the CCL Lot to Digital Equipment Corporation of Puerto Rico from 1971 to 1992. As set out in the complaint in this matter, the United States alleges that HP Inc. is jointly and severally liable for releases of hazardous substances at the Site.

WHEREAS, EPA is addressing the conditions at the Site through two separate operable units. Operable Unit 1 (“OU1”) addresses contaminated soils and shallow, highly contaminated groundwater within Retiro Industrial Park that act as ongoing sources of groundwater contamination. Operable Unit 2 (“OU2”) addresses broader site-wide groundwater.

WHEREAS, in accordance with section 105 of CERCLA, EPA listed the Site on the National Priorities List (“NPL”), set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on March 19, 2008, 73 Fed. Reg. 14719.

WHEREAS, in response to a release or a substantial threat of a release of hazardous substances at or from the Site, EPA completed a Remedial Investigation for OU1 on July 24, 2015, and a Feasibility Study for OU1 on July 22, 2015, in accordance with 40 C.F.R. § 300.430.

WHEREAS, in accordance with section 117 of CERCLA and 40 C.F.R § 300.430(f), EPA published notice of the completion of the Feasibility Study and a proposed plan for the OU1 remedial action on August 12, 2015, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action, including at a public meeting held near the Site in August 2015. A copy of the transcript of the public meeting and comments received are available to the public as part of the administrative record upon which the Director of the Superfund and Emergency Management Division, EPA Region 2, based the selection of a remedial action for OU1.

WHEREAS, EPA selected a remedial action to be implemented at OU1 of the Site, which is documented in a final record of decision (“OU1 Record of Decision”), executed on December 11, 2015. The OU1 Record of Decision includes a summary of responses to the public comments.

WHEREAS, HP submitted a Remedial Action Plan Technical Memorandum to EPA on October 29, 2021 (“Tech Memo”) that described HP’s approach to meeting the Remedial Action Objectives for OU1 at the CCL Lot. EPA reviewed and commented on the Tech Memo.

WHEREAS, EPA also selected a remedial action to be implemented at OU2 of the Site, which is documented in a final record of decision, executed on September 30, 2019. The record of decision for OU2 includes a summary of responses to the public comments.

WHEREAS, the United States in its complaint seeks, *inter alia* performance by the defendants of response actions at OU1 of the Site consistent with the National Contingency Plan, 40 C.F.R. part 300 (“NCP”).

WHEREAS, in accordance with the NCP and section 121(f)(1)(F) of CERCLA, EPA notified the Commonwealth of Puerto Rico (“Commonwealth”) on July 11, 2022, of negotiations with potentially responsible parties (“PRPs”) regarding the implementation of the remedial design and remedial action (“RD/RA”) for the Site, and EPA has provided the Commonwealth with an opportunity to participate in such negotiations and to be a party to this Consent Decree (“Decree”).

WHEREAS, in accordance with section 122(j)(1) of CERCLA, EPA notified the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service on July 11, 2022, of negotiations with PRPs regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and encouraged the trustee(s) to participate in the negotiation of this Decree.

WHEREAS, the defendants that have entered into this Decree (“Settling Defendants”) do not admit any liability to Plaintiff arising out of the transactions or occurrences alleged in the complaint, nor do they acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

WHEREAS, based on the information currently available, EPA has determined that the Work will be properly and promptly conducted by Settling Defendants if conducted in accordance with this Decree.

WHEREAS, the Parties recognize, and the Court by entering this Decree finds, that this Decree has been negotiated by the Parties in good faith, that implementation of this Decree will expedite the cleanup of the Site and will avoid prolonged and complicated litigation among the Parties, and that this Decree is fair, reasonable, in the public interest, and consistent with CERCLA.

NOW, THEREFORE, it is hereby **ORDERED** and **DECREED** as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1345, and sections 106 and 113(b) of CERCLA, and personal jurisdiction over the Parties. Venue lies in this judicial district under section 113(b) of CERCLA and 28 U.S.C. §§ 1391(b), and 1395(a), because the Site is located in this judicial district. This Court retains jurisdiction over the subject matter of this action and over the Parties for the purpose of resolving disputes arising under this Decree, entering orders modifying this Decree, or effectuating or enforcing compliance with this Decree. Settling Defendants may not challenge the terms of this Decree or this Court's jurisdiction to enter and enforce this Decree.

II. PARTIES BOUND

2. This Decree is binding upon the United States and upon Settling Defendants and their successors. Unless the United States otherwise consents, (a) any change in ownership or corporate or other legal status of any Settling Defendant, including any transfer of assets, or (b) any Transfer of the Site or any portion thereof, does not alter any of Settling Defendants' obligations under this Decree. Settling Defendants' responsibilities under this Decree cannot be assigned except under a modification executed in accordance with ¶ 66.

3. In any action to enforce this Decree, Settling Defendants may not raise as a defense the failure of any of their officers, directors, employees, agents, contractors, subcontractors, or any person representing Settling Defendants to take any action necessary to comply with this Decree. Each Settling Defendant shall provide notice of this Decree to each person representing that Settling Defendant with respect to the Site or the Work. Each Settling Defendant shall provide notice of this Decree to each contractor performing any Work on behalf of that Settling Defendant and shall ensure that notice of the Decree is provided to each subcontractor performing any Work on behalf of that Settling Defendant.

III. DEFINITIONS

4. Subject to the next sentence, terms used in this Decree that are defined in CERCLA or the regulations promulgated under CERCLA have the meanings assigned to them in CERCLA and the regulations promulgated under CERCLA. Whenever the terms set forth below are used in this Decree, the following definitions apply:

“CERCLA” means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

“CCL Future Response Costs” means all costs that the United States pays (i) in developing, reviewing and approving deliverables generated under the CCL SOW; (ii) in overseeing performance of the CCL Lot Work; (iii) in assisting or taking action to obtain access or use restrictions under ¶ 14.e relating to the CCL Lot or CCL SOW; (iv) in securing, implementing, monitoring, maintaining, or enforcing Institutional Controls relating to the CCL Lot or CCL SOW, including any compensation paid; (v) in taking action under ¶ 23 (Access to

Financial Assurance); (vi) in taking response action described in ¶ 50 because of PRIDCO and HP's failure to take emergency action under ¶ 5.5 of the CCL SOW; (vii) in implementing a Work Takeover for CCL Lot Work under ¶ 13; (viii) in implementing community involvement activities related to the CCL Lot Work including the cost of any technical assistance grant provided under section 117(e) of CERCLA; (ix) in enforcing this Decree against PRIDCO and HP, including all costs paid under Section XI (Dispute Resolution) and all litigation costs, relating to a dispute with PRIDCO and HP over the CCL Lot Work; and (x) in conducting periodic reviews in accordance with section 121(c) of CERCLA.

“CCL Lot” shall mean the area identified by PRIDCO as Project S-0551-0-60, located within the Retiro Industrial Park, including Source Areas 4 and 5 as identified in the Record of Decision.

“CCL Lot Work” means all obligations of HP and PRIDCO relating to the CCL Lot and CCL SOW under this Consent Decree.

“CCL Statement of Work” or “CCL SOW” means the document attached as Appendix B, which describes the activities HP and PRIDCO must perform to implement and maintain the effectiveness of the Remedial Action for the CCL Lot.

“Commonwealth” means the Commonwealth of Puerto Rico.

“Consent Decree” or “Decree” means this consent decree, all appendixes attached hereto (listed in Section XVIII), and all deliverables incorporated into the Decree under ¶ 7.6 of the CCL SOW and ¶ 7.6 of the Wallace SOW. If there is a conflict between a provision in Sections I through XXIII and a provision in any appendix or deliverable, the provision in Sections I through XXIII controls.

“Day” or “day” means a calendar day. In computing any period under this Decree, the day of the event that triggers the period is not counted and, where the last day is not a working day, the period runs until the close of business of the next working day. “Working day” means any day other than a Saturday, Sunday, or federal or Commonwealth holiday.

“DOJ” means the United States Department of Justice.

“Effective Date” means the date upon which the Court's approval of this Decree is recorded on its docket.

“EPA” means the United States Environmental Protection Agency.

“Fund” means the Hazardous Substance Superfund established under section 9507 of the Internal Revenue Code, 26 I.R.C. § 9507.

“Future Response Costs” means all costs (including direct, indirect, payroll, contractor, travel, and laboratory costs) that the United States pays after the Effective Date in implementing, overseeing, or enforcing this Decree. Future Response Costs includes CCL Future Response Costs, Wallace Future Response Costs, and Joint Response Costs.

“Including” or “including” means “including but not limited to.”

“Institutional Controls” means Proprietary Controls (*i.e.*, easements or covenants running with the land that (i) limit land, water, or other resource use, provide access rights, or both and (ii) are created under common law or statutory law by an instrument that is recorded, or for which notice is recorded, in the appropriate land records office) 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 noninterference with, or ensure the protectiveness of the Remedial Action; (c) provide information intended to modify or guide human behavior at or in connection with the Site; or (d) any combination thereof.

“Interest” means interest at the rate specified for interest on investments of the Fund, as provided under section 107(a) of CERCLA, compounded annually on October 1 of each year. The applicable rate of interest will 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. As of the date of lodging of this Decree, rates are available online at <https://www.epa.gov/superfund/superfund-interest-rates>.

“Joint Response Costs” means all costs (including direct, indirect, payroll, contractor, travel, and laboratory costs) that the United States pays after the Effective Date in implementing, overseeing, or enforcing this Decree and which are not solely allocable to the CCL Lot Work or the Wallace Lot Work.

“National Contingency Plan” or “NCP” means the National Oil and Hazardous Substances Pollution Contingency Plan promulgated under section 105 of CERCLA, codified at 40 C.F.R. Part 300, and any amendments thereto.

“OU1 Record of Decision” means the EPA decision document that memorializes the selection of the remedial action relating to OU1 at the Site signed on December 11, 2015, by the Director of the Emergency and Remedial Response Division, EPA Region 2, and all attachments thereto. The OU1 Record of Decision is attached as Appendix A.

“Paragraph” or “¶” means a portion of this Decree identified by an Arabic numeral or an upper- or lower-case letter.

“Party” means the United States or a Settling Defendant, and “Parties” means the United States and Settling Defendants.

“Performance Standards” means the cleanup levels and other measures of achievement of the remedial action objectives, as set forth in the OU1 Record of Decision.

“Plaintiff” means the United States.

“RCRA” means the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992k, (also known as the Resource Conservation and Recovery Act).

“Remedial Action” means the remedial action selected in the OU1 Record of Decision.

“Remedial Design” means those activities to be undertaken by Settling Defendants to develop plans and specifications for implementing the Remedial Action as set forth in the CCL SOW or Wallace SOW as applicable.

“Retiro Industrial Park” means the industrial park located in San German, Puerto Rico and owned by PRIDCO, where both the CCL Lot and the Wallace Lot are located.

“Scope of the Remedy” means the scope of the remedy set forth in ¶ 1.3 of each SOW.

“Section” means a portion of this Decree identified by a Roman numeral.

“Settlement Fund” means a designated or qualified settlement fund established pursuant to Internal Revenue Code Section 468B and over which this Court or another court or administrative or judicial body has continuing jurisdiction, for the payment, performance or security for the Wallace Lot Work and to which PRIDCO and Wallace shall assign and convey and transfer all rights, causes of action, choses in action, proceeds, recoveries and collections from third parties, including prior operators at the Wallace Lot, and insurers issuing coverage to PRIDCO, Wallace and/or prior operators of the Wallace Lot, in each case net of the costs of collection. The Settlement Fund may be a trust, limited liability company, corporation, partnership or other legal entity established pursuant to or authorized to do business under the law of the Commonwealth and maintained in the Commonwealth, with all matters pertaining to the Settlement Fund, and any and all related insurance policies or proceeds to be governed by the law of Puerto Rico.

“Settling Defendants” means HP Inc., on behalf of itself and on behalf of Digital Equipment Corporation and Digital Equipment Corporation de Puerto Rico (HP Inc., Digital Equipment Corporation and Digital Equipment Corporation de Puerto Rico are collectively referred to herein as “HP”), PRIDCO, Wallace Silversmiths de Puerto Rico, Ltd., and Lifetime Brands, Inc. (Wallace Silversmiths of Puerto Rico, Ltd. and Lifetime Brands, Inc. are collectively referred to herein as “Wallace”). As used in this Decree, this definition means all Settling Defendants, collectively, and each Settling Defendant, individually.

“Site” means the San German Groundwater Contamination Superfund Site, the area of contaminated soil and groundwater in San German, Puerto Rico, south of Guanajibo River and including the Retiro Industrial Park. The Site is comprised of two operable units. OU1 addresses contaminated soils and shallow, highly contaminated groundwater that act as ongoing sources of groundwater contamination and of vapors that can enter buildings and which includes the CCL Lot and the Wallace Lot. OU2 addresses the Site-wide groundwater contamination.

“Special Account” means the special account, within the Fund, established for the Site by EPA under section 122(b)(3) of CERCLA.

“Wallace Future Response Costs” means all costs that the United States pays (i) in developing, reviewing and approving deliverables generated under the Wallace SOW; (ii) in overseeing performance of the Wallace Lot Work; (iii) in assisting or taking action to obtain access or use restrictions under ¶ 14.e relating to the Wallace Lot or Wallace SOW; (iv) in securing, implementing, monitoring, maintaining, or enforcing Institutional Controls relating to the Wallace Lot or Wallace SOW, including any compensation paid; (v) in taking action under

¶ 23 (Access to Financial Assurance); (vi) in taking response action described in ¶ 50 because of PRIDCO and Wallace’s failure to take emergency action under ¶ 5.5 of the Wallace SOW; (vii) in implementing a Work Takeover for Wallace Lot Work under ¶ 13; (viii) in implementing community involvement activities related to the Wallace Lot Work including the cost of any technical assistance grant provided under section 117(e) of CERCLA; (ix) in enforcing this Decree against PRIDCO and Wallace, including all costs paid under Section XI (Dispute Resolution) and all litigation costs, relating to a dispute with PRIDCO and Wallace over the Wallace Lot Work; and (x) in conducting periodic reviews in accordance with section 121(c) of CERCLA.

“Wallace Lot” means the area identified by PRIDCO as Project T-0343-0-56 and 1-60 as well as T-0261-0-54, 1-62, and 2-72, located within the Retiro Industrial Park, including Source Areas 1, 2, and 3 as identified in the OU1 Record of Decision.

“Wallace Lot Work” means all obligations of Wallace and PRIDCO relating to the Wallace Lot and Wallace SOW under this Consent Decree.

“Wallace Statement of Work” or “Wallace SOW” means the document attached as Appendix C, which describes the activities Wallace and PRIDCO must perform to implement and maintain the effectiveness of the Remedial Action for the Wallace Lot.

“Transfer” means 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.

“United States” means the United States of America and each department, agency, and instrumentality of the United States, including EPA.

“Waste Material” means (a) any “hazardous substance” under Section 101(14) of CERCLA; (b) any pollutant or contaminant under section 101(33) of CERCLA; (c) any “solid waste” under section 1004(27) of RCRA.

“Work” means all obligations of Settling Defendants under Sections V (Performance of the Work) through VIII (Indemnification and Insurance). “Work” includes CCL Lot Work and Wallace Lot Work:

“Work Takeover” means EPA’s assumption of the performance of any of the Work in accordance with ¶ 13.

IV. OBJECTIVES

5. The objectives of the Parties in entering into this Decree are to protect public health, welfare, and the environment through the design, implementation, and operation and maintenance of response actions at OU1 of the Site by Settling Defendants, to pay response costs to be incurred by Plaintiff associated with the OU1 response actions, and to resolve and settle the claims of Plaintiff against Settling Defendants as provided in this Decree.

V. PERFORMANCE OF THE WORK

6. Consistent with ¶ 10 of this Decree, Wallace and PRIDCO shall develop the Remedial Design for the Wallace Lot and finance, develop, implement, operate, maintain, and monitor the effectiveness of the Remedial Action for the Wallace Lot all in accordance with the Wallace SOW, any modified Wallace SOW, and all EPA-approved, conditionally approved, or modified deliverables as required by the Wallace SOW or any modified Wallace SOW.

7. Consistent with ¶ 9 of this Decree, HP and PRIDCO shall develop the Remedial Design for the CCL Lot and finance, develop, implement, operate, maintain, and monitor the effectiveness of the Remedial Action for the CCL Lot all in accordance with the CCL SOW, any modified CCL SOW, and all EPA-approved, conditionally approved, or modified deliverables as required by the CCL SOW or modified CCL SOW.

8. Nothing in this Decree and no EPA approval of any deliverable required under this Decree constitutes a warranty or representation by EPA that completion of the Work will achieve the Performance Standards.

9. HP and PRIDCO's obligations to finance and perform the CCL Lot Work and to pay amounts due under this Decree are joint and several. HP shall perform the CCL Lot Work and pay related amounts due under this Decree, even if PRIDCO becomes insolvent or fails to participate in implementing the Decree. PRIDCO shall assist HP in securing access agreements as detailed in ¶ 14, provide access as detailed in ¶ 15, and cooperate in securing Institutional Controls as detailed in ¶ 16. In addition, PRIDCO shall provide in-kind services in furtherance of the CCL Lot Work. In the event HP becomes insolvent or fails to participate in implementing the Decree, and after the exhaustion of the financial assurance secured by HP under ¶ 18 of this Decree, PRIDCO shall complete the CCL Lot Work and make the related payments due under this Decree.

10. Wallace and PRIDCO's obligations to finance and perform the Wallace Lot Work and to pay amounts due under this Decree are joint and several. Wallace and PRIDCO may establish and maintain a Settlement Fund as the primary source of funds to finance and perform the Wallace Lot Work and to pay amounts due under this Decree. To the extent that the Settlement Fund is unable to fully cover the costs to perform the Wallace Lot Work and make related payments due under this Decree, Wallace shall perform the Wallace Lot Work and make the payments even if PRIDCO becomes insolvent or fails to participate in implementing the Decree. PRIDCO shall assist Wallace in securing access agreements as detailed in ¶ 14, provide access as detailed in ¶ 15, and cooperate in securing Institutional Controls as detailed in ¶ 16. In addition, PRIDCO shall provide in-kind services in furtherance of the Wallace Lot Work. In the event Wallace becomes insolvent or fails to participate in implementing the Decree, and after the exhaustion of the financial assurance secured by Wallace under ¶ 18 of this Decree, PRIDCO shall complete the Wallace Lot Work and make the related payments due under this Decree to the extent the Settlement Fund is unable to do so.

11. Modifications to the Remedial Action and Further Response Actions

a. Nothing in this Decree limits EPA's authority to modify the Remedial Action or to select further response actions for the Site in accordance with the requirements of CERCLA and the NCP. Nothing in this Decree limits Settling Defendants' rights, under sections 113(k)(2) or 117 of CERCLA, to comment on any modified or further response actions proposed by EPA.

b. If EPA modifies the Remedial Action in order to achieve or maintain the Performance Standards, or both, or to carry out and maintain the effectiveness of the Remedial Action, and such modification is consistent with the Scope of the Remedy, then the applicable Settling Defendants shall implement the modification as provided in ¶ 11.c.

c. Upon receipt of notice from EPA that it has modified the Remedial Action as provided in ¶ 11.b and requesting that the applicable Settling Defendants implement the modified Remedial Action, those Settling Defendants shall implement the modification, subject to their right to initiate dispute resolution under Section XI within 30 days after receipt of EPA's notice. Wallace shall modify the Wallace SOW or related work plans or both, and/or HP shall modify the CCL SOW or related work plans or both, as needed to implement the Remedial Action modification, or if one or more Settling Defendants invoke dispute resolution, in accordance with the final resolution of the dispute. The Remedial Action modification, the approved modified SOW(s), and any related work plans will be deemed to be incorporated into and enforceable under this Decree.

12. Compliance with Applicable Law. Nothing in this Decree affects Settling Defendants' obligations to comply with all applicable federal and state laws and regulations. Settling Defendants must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the OU1 Record of Decision and the applicable SOW. The activities conducted in accordance with this Decree, if approved by EPA, will be deemed to be consistent with the NCP as provided under section 300.700(c)(3)(ii).

13. Work Takeover

a. If EPA determines that any Settling Defendant (i) has ceased to perform any of the Work required under this Section; (ii) is seriously or repeatedly deficient or late in performing the Work required under this Section; or (iii) is performing the Work required under this Section in a manner that may cause an endangerment to human health or the environment, EPA may issue a notice of Work Takeover to that Settling Defendant related to that Settling Defendant's Work, including a description of the grounds for the notice and a period of time ("Remedy Period") within which that Settling Defendant must remedy the circumstances giving rise to the notice. The Remedy Period will be 30 days, unless EPA determines in its unreviewable discretion that there may be an endangerment, in which case the Remedy Period will be 10 days.

b. If, by the end of the Remedy Period, the noticed Settling Defendant does not remedy to EPA's satisfaction the circumstances giving rise to the notice of Work Takeover,

EPA may notify such Settling Defendant and, as it deems necessary, commence a Work Takeover of the Work that was being performed by that Settling Defendant.

c. EPA may conduct the Work Takeover during the pendency of any dispute under Section XI but shall terminate the Work Takeover if and when: (i) the Settling Defendant subject to the Work Takeover remedies, to EPA's satisfaction, the circumstances giving rise to the notice of Work Takeover; or (ii) upon the issuance of a final determination under Section XI (Dispute Resolution) that EPA is required to terminate the Work Takeover.

VI. PROPERTY REQUIREMENTS

14. Agreements Regarding Access and Noninterference

a. As used in this Section, "Other Affected Property" means any real property, not owned by PRIDCO, where EPA determines, at any time, that access; land, water, or other resource use restrictions; Institutional Controls; or any combination thereof, are needed to implement the Remedial Action.

b. HP, with the assistance of PRIDCO, shall use best efforts to secure access agreements from the owner(s) of Other Affected Property where access is needed to implement CCL Lot Work. Wallace, with the assistance of PRIDCO, shall use best efforts to secure access agreements from owner(s) of Other Affected Property where access is needed to implement Wallace Lot Work. If access is needed to implement the CCL Lot Work and the Wallace Lot Work, HP and Wallace, with the assistance of PRIDCO, will work together to use best efforts to secure access agreements of the owners of such Other Affected Property. The access agreements secured under this ¶ 14.b will be enforceable by Settling Defendants and by Plaintiff, and will require the owner to provide Plaintiff and Settling Defendants, and their respective representatives, contractors, and subcontractors with access at all reasonable times to such owner's property to conduct any activity regarding the Decree, including the following:

- (1) implementing the Work and overseeing compliance with the Decree;
- (2) conducting investigations of contamination at or near the Site;
- (3) assessing the need for, planning, or implementing additional response actions at or near the Site;
- (4) determining whether the Site is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Decree; and
- (5) implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and Institutional Controls.

c. Further, each agreement required under ¶ 14.b must commit the owner to refrain from using its property in any manner that EPA determines will pose an unacceptable risk to human health or to the environment as a result of exposure to Waste Material, or will interfere

with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action, including using contaminated groundwater.

d. As used in this Section, “best efforts” means the efforts that a reasonable person in the position of Settling Defendants would use 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.

e. HP and Wallace shall provide to EPA a copy of each agreement required under ¶ 14.b. If HP and Wallace, with the assistance of PRIDCO, cannot accomplish what is required through best efforts in a timely manner, they shall notify EPA, and include a description of the steps taken to achieve the requirements. If the United States deems it appropriate, it may assist Settling Defendants, or take independent action, to obtain such access or use restrictions.

15. **Access and Noninterference by PRIDCO.** PRIDCO shall: (a) provide Plaintiff, HP, Wallace, and their representatives, contractors, and subcontractors with access at all reasonable times to the Retiro Industrial Park to conduct any activity required under the Decree, including those listed in ¶ 14.b upon prior notice; and (b) refrain from using the Retiro Industrial Park in any manner that EPA determines will pose an unacceptable risk to human health or to the environment because of exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action, including using contaminated groundwater, and (c) exercise best efforts to ensure that animals and trespassers cannot enter the CCL Lot and promptly remove any animals or trespassers that enter the CCL Lot.

16. 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 appropriate at the Retiro Industrial Park, PRIDCO shall cooperate with EPA’s efforts to secure and ensure compliance with such Institutional Controls.

17. Notwithstanding any provision of the Decree, 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 and Institutional Controls, including related enforcement authorities, under CERCLA, RCRA, and any other applicable statute or regulations.

VII. FINANCIAL ASSURANCE

18. To ensure completion of the CCL Lot Work required under Section V, HP shall secure financial assurance, initially in the amount of \$2,060,000 (“Estimated Cost of the CCL Lot Work”), for the benefit of EPA. To ensure completion of the Wallace Lot Work required under Section V, Wallace shall secure financial assurance, initially in the amount of \$5,640,000 (“Estimated Cost of the Wallace Lot Work”), for the benefit of EPA. The financial assurance must: (i) be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA; and (ii) be satisfactory to EPA. As of the date of lodging of this Decree, the sample documents can be found under the “Financial Assurance - Settlements” category on the Cleanup Enforcement Model Language and Sample Documents

Database at <https://cfpub.epa.gov/compliance/models/>. Wallace and HP may use multiple mechanisms if they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, insurance policies, or some combination thereof. The following are acceptable mechanisms:

a. a surety bond guaranteeing payment, performance of the Work, or both, 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 EPA 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 Wallace or HP that they meet the relevant test criteria of ¶ 19, accompanied by a standby funding commitment that requires the applicable Settling Defendant 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 Wallace or HP or has a “substantial business relationship” (as defined in 40 C.F.R. § 264.141(h)) with Wallace or HP; and (2) demonstrates to EPA’s satisfaction that it meets the financial test criteria of ¶ 19.

19. Settling Defendants seeking to provide financial assurance by means of a demonstration or guarantee under ¶ 18.e or 18.f must, within 30 days after the Effective Date:

a. demonstrate that:

(1) it or its 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 applicable Estimated Cost of the Work (i.e., for Wallace the Estimated Cost of the Wallace Lot Work and for HP the Estimated Cost of the CCL Lot 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) it or its 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 applicable 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 applicable Settling Defendant 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. As of the date of lodging of this Decree, a sample letter and report is available 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/>.

20. Each Settling Defendant providing financial assurance by means of a demonstration or guarantee under ¶ 18.e or 18.f must also:

a. annually resubmit the documents described in ¶ 19.b within 90 days after the close of the applicable Settling Defendant's or guarantor's fiscal year;

b. notify EPA within 30 days after the applicable Settling Defendant 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 30 days of EPA's request, reports of the financial condition of the applicable Settling Defendant or guarantor in addition to those specified in ¶ 19.b; EPA may make such a request at any time based on a belief that the applicable Settling Defendant or guarantor may no longer meet the financial test requirements of this Section.

21. HP and Wallace shall each, within 30 days after the Effective Date, seek EPA's approval of the form of their respective financial assurance. Within 30 days after such approval, HP and Wallace shall secure all executed 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 Region 2 Chief of the Resource Management/Cost Recovery Section, to DOJ, and to EPA in accordance with ¶ 64.

22. HP and Wallace shall diligently monitor the adequacy of their financial assurance. If HP or Wallace becomes aware of any information indicating that their financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, such Settling Defendant shall notify EPA of such information within seven 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 that Settling Defendant of such determination. The Settling Defendant notified under this Paragraph shall, within 30 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 that Settling Defendant, 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 60 days. That Settling Defendant shall follow the procedures of ¶ 24 in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. That Settling Defendant's inability to secure financial assurance in accordance with this Section does not excuse performance of any other requirement of this Decree.

23. Access to Financial Assurance

a. If EPA issues a notice of a Work Takeover under ¶ 13.b, then, in accordance with any applicable financial assurance mechanism including the related standby funding commitment, EPA may require that any funds guaranteed be paid in accordance with ¶ 23.d.

b. If EPA is notified that the issuer of a financial assurance mechanism intends to cancel the mechanism, and the affected Settling Defendant fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with ¶ 23.d.

c. If, upon issuance of a notice of a Work Takeover under ¶ 13.b, either: (1) EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism including the related standby funding commitment, whether in cash or in kind, to continue and complete the Work; or (2) the financial assurance is a demonstration or guarantee under ¶ 18.e or 18.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 by that Settling Defendant. That Settling Defendant shall, within 30 days after such demand, pay the amount demanded as directed by EPA.

d. Any amounts required to be paid under this ¶ 23 must 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 Fund or into the Special Account 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 Fund.

24. **Modification of Amount, Form, or Terms of Financial Assurance.** Beginning after the first anniversary of the Effective Date, and no more than once per calendar year, a Settling Defendant may submit a request to change the form, terms, or amount of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with ¶ 21, and must include an estimate of the cost of the remaining Work to be performed by that Party, 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 the requesting Settling Defendant of its decision regarding the request. The requesting Settling Defendant may initiate dispute resolution under Section XI by the earlier of 30 days after receipt of EPA's decision or 180 days after EPA's receipt of the request. A Settling Defendant may modify the form, terms, or amount of the financial assurance mechanism only: (a) in accordance with EPA's approval; or (b) in accordance with any resolution of a dispute under Section XI. The requesting Settling Defendant shall submit to EPA, within 30 days after receipt of EPA's approval or consistent with the terms of the resolution of the dispute, documentation of the change to the form, terms, or amount of the financial assurance instrument.

25. **Release, Cancellation, or Discontinuation of Financial Assurance.** Settling Defendants may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a Certification of Work Completion under ¶ 5.9 of the applicable SOW; (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, final administrative decision, or final judicial decision resolving such dispute under Section XI.

VIII. INDEMNIFICATION AND INSURANCE

26. Indemnification

a. Plaintiff does not assume any liability by entering into this Decree or by virtue of any future designation of any Settling Defendant as EPA's authorized representatives

under section 104(e)(1) of CERCLA should that occur. Settling Defendants shall indemnify and save and hold harmless Plaintiff and its officials, agents, employees, contractors, subcontractors, and representatives for or from any claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of that Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on Settling Defendants' behalf or under their control, in carrying out activities under this Decree, including any claims arising from any future designation of any Settling Defendant as EPA's authorized representatives under section 104(e)(1) of CERCLA. Further, any applicable Settling Defendant agrees to pay Plaintiff all costs Plaintiff incurs including attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against Plaintiff based on negligent or other wrongful acts or omissions of that Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control in carrying out activities under with this Decree. Plaintiff may not be held out as a party to any contract entered into by or on behalf of any Settling Defendant in carrying out activities under this Decree. No Settling Defendant nor any such contractor may be considered an agent of Plaintiff.

b. Plaintiff shall give Settling Defendants notice of any claim for which Plaintiff plans to seek indemnification in accordance with this ¶ 26, and shall consult with Settling Defendant(s) prior to settling such claim.

27. Settling Defendants covenant not to sue and shall not assert any claim or cause of action against Plaintiff for damages or reimbursement or for set-off of any payments made or to be made to Plaintiff, arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendants and any person for performance of Work or other activities on or relating to the Site, including claims on account of construction delays. In addition, Settling Defendants shall indemnify and save and hold Plaintiff harmless with respect to any claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more Settling Defendants and any person for performance of Work at or relating to the Site, including claims on account of construction delays.

28. Insurance.

a. Wallace shall secure, by no later than 15 days before commencing the Wallace Lot Work, the following insurance: (a) commercial general liability insurance with limits of liability of \$1 million per occurrence; (b) automobile liability insurance with limits of liability of \$1 million per accident; and (c) umbrella liability insurance with limits of liability of \$5 million in excess of the required commercial general liability and automobile liability limits. The insurance policy must name Plaintiff as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Wallace under this Decree. Wallace shall maintain this insurance until the first anniversary after EPA has certified completion of remedial action under ¶ 5.7 of the Wallace SOW. In addition, for the duration of this Decree, Wallace shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Wallace Lot Work on behalf of Wallace in furtherance of this Decree. Prior to commencement of the Wallace Lot Work, Wallace shall provide to EPA certificates of

such insurance and a copy of each insurance policy. Wallace shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Wallace demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Wallace need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Wallace shall ensure that all submittals to EPA under this Paragraph identify the San German Groundwater Contamination Site and the civil action number of this case.

b. HP shall secure, by no later than 15 days before commencing the CCL Lot Work, the following insurance: (a) commercial general liability insurance with limits of liability of \$1 million per occurrence; (b) automobile liability insurance with limits of liability of \$1 million per accident; and (c) umbrella liability insurance with limits of liability of \$5 million in excess of the required commercial general liability and automobile liability limits. The insurance policy must name Plaintiff as an additional insured with respect to all liability arising out of the activities performed by or on behalf of HP under this Decree. HP shall maintain this insurance until the first anniversary after EPA has certified completion of remedial action under ¶ 5.7 of the CCL SOW. In addition, for the duration of this Decree, HP shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the CCL Lot Work on behalf of HP in furtherance of this Decree. Prior to commencement of the CCL Lot Work, HP shall provide to EPA certificates of such insurance and a copy of each insurance policy. HP shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If HP demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, HP need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. HP shall ensure that all submittals to EPA under this Paragraph identify the San German Groundwater Contamination Site and the civil action number of this case.

IX. PAYMENTS FOR RESPONSE COSTS

29. Payments by Settling Defendants for Future Response Costs

a. **Periodic Bills.** On a periodic basis, EPA will send the Settling Defendants a bill for Joint Future Response Costs, EPA will send Wallace and PRIDCO a bill for Wallace Future Response Costs, and EPA will send HP and PRIDCO a bill for CCL Future Response Costs. Each bill will include an e-Recovery Report listing direct and indirect costs paid by EPA, its contractors, subcontractors, and DOJ as related to that bill. The applicable Settling Defendant pursuant to ¶ 29.b may initiate a dispute under Section XI regarding a Future Response Cost billing, but only if the dispute relates to one or more of the following issues: (i) whether EPA has made an arithmetical error; (ii) whether EPA has included a cost item that is not within the definition of Future Response Costs; (iii) whether EPA has paid excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP, or (iv) whether EPA has incorrectly allocated costs to Wallace Future Response Costs, CCL Future Response Costs, or Joint Future Response Costs that should be in a different category of Future

Response Costs. The Settling Defendant must specify in the Notice of Dispute the contested costs and the basis for the objection.

b. **Payment of Bill.** The Settling Defendants that received a bill for Future Response Costs shall pay the bill consistent with ¶¶ 9 and 10, or if a Settling Defendant initiates dispute resolution, it shall pay the uncontested portion of the bill, if any, within 30 days after receipt of the bill. The billed Settling Defendants shall pay the contested portion of the bill determined to be owed, if any, within 30 days after the determination regarding the dispute. Each payment for: (i) the uncontested bill or portion of bill, if late, and; (ii) the contested portion of the bill determined to be owed, if any, must include an additional amount for Interest accrued from the date of receipt of the bill through the date of payment. Each billed Settling Defendant shall make payment at <https://www.pay.gov> using the “EPA Miscellaneous Payments Cincinnati Finance Center” link, and including references to the Site/Spill ID and DJ numbers listed in ¶ 64 and the purpose of the payment. Each Settling Defendant shall send notices of this payment to DOJ and EPA in accordance with ¶ 64.

30. **Deposit of Payments.** EPA may, in its unreviewable discretion, deposit the amounts paid under 29.b in the Fund, in the Special Account, or both. EPA may, in its unreviewable discretion, retain and use any amounts deposited in the Special Account to conduct or finance response actions at or in connection with the Site, or transfer those amounts to the Fund.

X. FORCE MAJEURE

31. “Force majeure,” for purposes of this Decree, means any event arising from causes beyond the control of Settling Defendants, of any entity controlled by Settling Defendants, or of Settling Defendants’ contractors that delays or prevents the performance of any obligation under this Decree despite Settling Defendants’ best efforts to fulfill the obligation. Given the need to protect public health and welfare and the environment, the requirement that Settling Defendants 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 a failure to achieve the Performance Standards.

32. If any event occurs for which a Settling Defendant will or may claim a force majeure, that Settling Defendant shall notify EPA’s Project Coordinator by email. The deadline for the initial notice is four days after the date that Settling Defendant first knew or should have known that the event would likely delay performance. A Settling Defendant shall be deemed to know of any circumstance of which any contractor of, subcontractor of, or entity controlled by that Settling Defendant knew or should have known. Within 14 days thereafter, the claiming Settling Defendant shall send a further notice to EPA that includes the following: (i) a description of the event and its effect on Settling Defendant’s completion of the requirements of the Decree; (ii) a description of all actions taken or to be taken to prevent or minimize the adverse effects or delay; (iii) the proposed extension of time for Settling Defendant to complete the requirements of the Decree; (iv) a statement as to whether, in the opinion of Settling

Defendant, such event may cause or contribute to an endangerment to public health or welfare, or the environment; and (v) all available proof supporting its claim of force majeure. Failure to comply with the notice requirements herein regarding an event precludes the claiming Settling Defendant from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 31 and whether the Settling Defendant has exercised its best efforts under ¶ 31, EPA may, in its unreviewable discretion, excuse in writing that Settling Defendant's failure to submit timely or complete notices under this Paragraph.

33. EPA will notify the claiming Settling Defendant of its determination whether Settling Defendant is entitled to relief under ¶ 31, and, if so, the duration of the extension of time for performance of the obligations affected by the force majeure. 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. The claiming Settling Defendant may initiate dispute resolution under Section XI regarding EPA's determination within 15 days after receipt of the determination. In any such proceeding, the Settling Defendant has the burden of proving that it is entitled to relief under ¶ 31 and that its proposed extension was or will be warranted under the circumstances.

34. The failure by EPA to timely complete any activity under the Decree or the CCL SOW or the Wallace SOW is not a violation of the Decree, provided, however, that if such failure prevents a Settling Defendant from timely completing a requirement of the Decree, that Settling Defendant may seek relief under this Section.

XI. DISPUTE RESOLUTION

35. Unless otherwise provided in this Decree, Settling Defendants must use the dispute resolution procedures of this Section to resolve any dispute arising under this Decree. Settling Defendants shall not initiate a dispute challenging the remedy set forth in the OU1 Record of Decision. The United States may enforce any requirement of the Decree that is not the subject of a pending dispute under this Section.

36. A dispute will be considered to have arisen when one or more parties sends a written notice of dispute in accordance with ¶ 64. Disputes arising under this Decree must in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations may not exceed 20 days after the dispute arises, unless the parties to the dispute otherwise agree. If the parties cannot resolve the dispute by informal negotiations, the position advanced by EPA is binding unless the disputing Settling Defendant initiates formal dispute resolution under ¶ 37. By agreement of the parties to the dispute, mediation may be used during this informal negotiation period to assist the parties in reaching a voluntary resolution or narrowing of the matters in dispute.

37. Formal Dispute Resolution

a. **Statements of Position.** A Settling Defendant may initiate formal dispute resolution by serving on the Plaintiff, within 20 days after the conclusion of informal dispute resolution under ¶ 36, an initial Statement of Position regarding the matter in dispute. The

Plaintiff's responsive Statement of Position is due within 20 days after receipt of the initial Statement of Position. All Statements of Position must include supporting factual data, analysis, opinion, and other documentation. A reply, if any, is due within 10 days after receipt of the response. If appropriate, EPA may extend the deadlines for filing statements of position for up to 45 days and may allow the submission of supplemental statements of position.

b. **Formal Decision.** The Deputy Director of the Superfund & Emergency Management Division, EPA Region 2, or, at the sole discretion of EPA, someone occupying a higher position, will issue a formal decision resolving the dispute ("Formal Decision") based on the statements of position and any replies and supplemental statements of position. The Formal Decision is binding on the disputing Settling Defendant unless it timely seeks judicial review under ¶ 38.

c. **Compilation of Administrative Record.** EPA shall compile an administrative record regarding the dispute, which must include all statements of position, replies, supplemental statements of position, and the Formal Decision.

38. **Judicial Review**

a. A Settling Defendant may obtain judicial review of the Formal Decision by filing, within 20 days after receiving it, a motion with the Court and serving the motion on all Parties. The motion must describe the matter in dispute and the relief requested. The parties to the dispute shall brief the matter in accordance with local court rules.

b. **Review on the Administrative Record.** Judicial review of disputes regarding the following issues must be on the administrative record: (i) the adequacy or appropriateness of deliverables required under the Decree; (ii) the adequacy of the performance of the Remedial Action; (iii) whether a Work Takeover is warranted under ¶ 13; (iv) determinations about financial assurance under Section VII; (v) EPA's selection of modified or further response actions; (vi) any other items requiring EPA approval under the Decree; and (vii) any other disputes that the Court determines should be reviewed on the administrative record. For all of these disputes, the applicable Settling Defendant(s) bear the burden of demonstrating that the Formal Decision was arbitrary and capricious or otherwise not in accordance with law.

c. Judicial review of any dispute not governed by ¶ 38.b shall be governed by applicable principles of law.

39. **Escrow Account.** For disputes regarding a Future Response Cost billing, Settling Defendants shall: (a) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation ("FDIC"); (b) remit to that escrow account funds equal to the amount of the contested Future Response Costs; and (c) send to EPA, in accordance with ¶ 64, copies of the correspondence and of the payment documentation (e.g., the check) that established and funded the escrow account, including the name of the bank, the bank account number, and a bank statement showing the initial balance in the account. EPA may, in its unreviewable discretion, waive the requirement to establish the escrow account. Settling Defendants shall cause the escrow agent to pay the amounts due to EPA

under ¶ 29, if any, by the deadline for such payment in ¶ 29. Settling Defendants are responsible for any balance due under ¶ 29 after the payment by the escrow agent.

40. The initiation of dispute resolution procedures under this Section does not extend, postpone, or affect in any way any requirement of this Decree, except as EPA agrees, or as determined by the Court. Stipulated penalties with respect to the disputed matter will continue to accrue, but payment is stayed pending resolution of the dispute, as provided in ¶ 43.

XII. STIPULATED PENALTIES

41. Unless the noncompliance is excused under Section X (Force Majeure), each Settling Defendant is liable to the United States for the following stipulated penalties:

a. for each respective Settling Defendant's failure: (i) to pay any amount due under Section IX; (ii) to establish and maintain financial assurance in accordance with Section VII; (iii) to submit timely or adequate deliverables under Section 9 of the applicable SOW; (iv) timely initiation, performance, and completion of the Remedial Design and Remedial Action in accordance with the OUI Record of Decision, the applicable SOW, or this Decree, and plans and schedules approved thereunder, including any deadline imposed by the applicable SOW or by any plan that is prepared pursuant to the applicable SOW and approved by EPA; (v) obligations imposed by the Emergency Response and Reporting provisions under ¶ 5.5 of the applicable SOW; and (vi) obligations imposed by Section VI (Property Requirements):

Period of Noncompliance	Penalty Per Noncompliance Per Day
1 st through 14 th day	\$1,000
15 th through 30 th day	\$1,750
31 st day and beyond	\$3,000

b. for each respective Settling Defendant's failure to submit timely or adequate deliverables required by this Decree other than those specified in ¶ 41.a:

Period of Noncompliance	Penalty Per Noncompliance Per Day
1 st through 14 th day	\$400
15 th through 30 th day	\$800
31 st day and beyond	\$1,500

42. **Work Takeover Penalty.** If EPA commences a Work Takeover, the Settling Defendant whose work is being taken over is liable for a stipulated penalty in the amount of \$800,000. This stipulated penalty is in addition to the remedy available to EPA under ¶ 23 (Access to Financial Assurance) to fund the performance of the Work by EPA.

43. **Accrual of Penalties.** Stipulated penalties accrue from the date performance is due, or the day a noncompliance occurs, whichever is applicable, until the date the requirement is completed or the final day of the correction of the noncompliance. Nothing in this Decree prevents the simultaneous accrual of separate penalties for separate instances of noncompliance with this Decree. Stipulated penalties accrue regardless of whether that Settling Defendant has been notified of its noncompliance, and regardless of whether that Settling Defendants has

initiated dispute resolution under Section XI, provided, however, that no penalties will accrue as follows:

a. with respect to a submission that EPA subsequently determines is deficient under ¶ 7.6 of the relevant SOW, during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies the relevant Settling Defendant(s) of any deficiency;

b. with respect to a matter that is the subject of dispute resolution under Section XI, during the period, if any, beginning on the 21st day after the later of the date that EPA's Statement of Position is received or the date that the Settling Defendant's reply thereto (if any) is received until the date of the Formal Decision under ¶ 37.b; or

c. with respect to a matter that is the subject of judicial review by the Court under ¶ 38, during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute.

44. **Demand and Payment of Stipulated Penalties.** EPA may send any Settling Defendant(s) a demand for stipulated penalties. The demand will include a description of the noncompliance and will specify the amount of the stipulated penalties owed. The affected Settling Defendant may initiate dispute resolution under Section XI within 30 days after receipt of the demand. The affected Settling Defendant shall pay the amount demanded or, if it initiates dispute resolution, the uncontested portion of the amount demanded, within 30 days after receipt of the demand. The affected Settling Defendant shall pay the contested portion of the penalties determined to be owed, if any, within 30 days after the resolution of the dispute. Each payment for: (a) the uncontested penalty demand or uncontested portion, if late; and (b) the contested portion of the penalty demand determined to be owed, if any, must include an additional amount for Interest accrued from the date of receipt of the demand through the date of payment. The affected Settling Defendant shall make payment at <https://www.pay.gov> using the link for "EPA Miscellaneous Payments Cincinnati Finance Center," including references to the Site/Spill ID and DJ numbers listed in ¶ 64, and the purpose of the payment. Settling Defendants shall send a notice of this payment to DOJ and EPA, in accordance with ¶ 64. The payment of stipulated penalties and Interest, if any, does not alter any obligation by Settling Defendants under the Decree.

45. Nothing in this Decree limits the authority of the United States to seek (a) any remedy otherwise provided by law for a Settling Defendant's failure to pay stipulated penalties or Interest; or (b) any other remedies or sanctions available by virtue of a Settling Defendant's noncompliance with this Decree or of the statutes and regulations upon which it is based, including penalties under section 122(l) of CERCLA, provided, however, that the United States may not seek civil penalties under section 122(l) of CERCLA for any noncompliance for which a stipulated penalty is provided for in this Decree, except in the case of a willful noncompliance with this Decree.

46. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued under this Decree.

XIII. COVENANTS BY PLAINTIFF

47. **Covenants for Settling Defendants.** Subject to ¶ 49, the United States covenants not to sue or to take administrative action against Settling Defendants under sections 106 and 107(a) of CERCLA regarding the Work and Future Response Costs.

48. The covenants under ¶ 47 (a) take effect upon the Effective Date, (b) are conditioned on the satisfactory performance by each Settling Defendant of their respective requirements under this Decree, (c) extend to the successors of each Settling Defendant but only to the extent that the alleged liability of the successor of the Settling Defendant is based solely on its status as a successor of the Settling Defendant, and (d) do not extend to any other person.

49. **General Reservations.** Notwithstanding any other provision of this Decree, the United States reserves, and this Decree is without prejudice to, all rights against Settling Defendants regarding the following:

- a. liability for failure by Settling Defendants to meet a requirement of this Decree;
- b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material unrelated to OU1;
- c. liability based on Settling Defendants' ownership of the Site when such ownership commences after Settling Defendants' signature of this Decree;
- d. liability based on Settling Defendants' operation of the Site when such operation commences after Settling Defendants' signature of this Decree and does not arise solely from Settling Defendants' performance of the Work;
- e. liability based on Settling Defendants' transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, after signature of this Decree by Settling Defendants, other than as provided in the OU1 Record of Decision, under this Decree, or ordered by EPA;
- f. liability for the final response action at the Site or operable units at the Site other than OU1;
- g. liability for costs that the United States has incurred and will incur regarding the Site but that are not within the definition of Future Response Costs;
- h. liability, prior to achievement of Performance Standards, for additional response actions that EPA determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the Remedial Action, but that are not covered by ¶ 11.b; and

- i. criminal liability.

50. Subject to ¶ 47, nothing in this Decree limits any authority of Plaintiff to take, direct, or order all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or to request a Court to order such action.

XIV. COVENANTS BY SETTLING DEFENDANTS

51. Covenants by Settling Defendants

a. Subject to ¶ 52, Settling Defendants covenant not to sue and shall not assert any claim or cause of action against the United States under CERCLA, section 7002(a) of RCRA, the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, the Commonwealth Constitution, Commonwealth law, or at common law regarding the Work and Future Response Costs.

b. Subject to ¶ 52, Settling Defendants covenant not to seek reimbursement from the Fund through CERCLA or any other law for costs of the Work and Future Response Costs.

52. **Settling Defendants' Reservation.** The covenants in ¶ 51 do not apply to any claim or cause of action brought, or order issued, after the Effective Date by the United States to the extent such claim, cause of action, or order is within the scope of a reservation under ¶¶ 49.a through 49.i.

XV. EFFECT OF SETTLEMENT; CONTRIBUTION

53. The Parties agree and the Court finds that: (a) the complaint filed by the United States in this action is a civil action within the meaning of section 113(f)(1) of CERCLA; (b) this Decree constitutes a judicially approved settlement under which each Settling Defendant has, as of the Effective Date, resolved its liability to the United States within the meaning of sections 113(f)(2) and 113(f)(3)(B) of CERCLA; and (c) each Settling Defendant is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the “matters addressed” in this Decree, except as between Wallace and PRIDCO with respect to the Wallace Lot. The “matters addressed” in this Decree are the Work and Future Response Costs, provided, however, that if the United States exercises rights under the reservations in ¶¶ 49.a through 49.h, the “matters addressed” in this Decree will no longer include those response costs or response actions that are within the scope of the exercised reservation.

54. Each Settling Defendant shall, with respect to any suit or claim brought by it for matters related to this Decree, notify DOJ and EPA no later than 60 days prior to the initiation of such suit or claim. Each Settling Defendant shall, with respect to any suit or claim brought against it for matters related to this Decree, notify DOJ and EPA within 10 days after service of the complaint on such Settling Defendant. In addition, each Settling Defendant shall notify DOJ

and EPA within 10 days after service or receipt of any Motion for Summary Judgment and within 10 days after receipt of any order from a court setting a case for trial.

55. **Res Judicata and Other Defenses.** In any subsequent administrative or judicial proceeding initiated against any Settling Defendant by Plaintiff for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendants shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, claim preclusion (*res judicata*), issue preclusion (*collateral estoppel*), claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case.

56. Nothing in this Decree diminishes the right of the United States under section 113(f)(2) and (3) of CERCLA to pursue any person not a party to this Decree 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).

XVI. RECORDS

57. **Settling Defendant Certification.** Each Settling Defendant certifies individually that: (a) it has implemented a litigation hold on documents and electronically stored information relating to the Site, including information relating to its potential liability under CERCLA regarding the Site, since the earlier of notification of potential liability by the United States or the State or the filing of suit against it regarding the Site; and (b) it has fully complied with any and all EPA requests for information under sections 104(e) and 122(e) of CERCLA, and section 3007 of RCRA.

58. Retention of Records and Information

a. Settling Defendants shall retain, and instruct their contractors and agents to retain, the following documents and electronically stored data (“Records”) until 10 years after the date when the Certification of Completion of the Work has been issued under both SOWs ¶ 5.9 (the “Record Retention Period”):

- (1) All records regarding Settling Defendants’ liability under CERCLA regarding the Site;
- (2) All reports, plans, permits, and documents submitted to EPA in accordance with this Decree, including all underlying research and data; and
- (3) All data developed by, or on behalf of, Settling Defendants in the course of performing the Remedial Action.

b. Each Settling Defendant shall retain all Records regarding the liability of any person under CERCLA regarding the Site during the Record Retention Period.

c. At the end of the Record Retention Period, Settling Defendants shall notify EPA that it has 90 days to request the Settling Defendants’ Records subject to this Section.

Settling Defendants shall retain and preserve their Records subject to this Section until 90 days after EPA's receipt of the notice. These record retention requirements apply regardless of any corporate record retention policy.

59. Settling Defendants shall provide to EPA, upon request, copies of all Records and information required to be retained under this Section. Settling Defendants shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

60. Privileged and Protected Claims

a. A Settling Defendant may assert that all or part of a record requested by Plaintiff is privileged or protected as provided under federal law, in lieu of providing the record, provided that the Settling Defendant complies with ¶ 60.b, and except as provided in ¶ 60.c.

b. If a Settling Defendant asserts a claim of privilege or protection, it shall provide Plaintiff 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, the Settling Defendant shall provide the record to Plaintiff in redacted form to mask the privileged or protected portion only. The Settling Defendant shall retain all records that it claims to be privileged or protected until Plaintiff has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the Settling Defendant's favor.

c. Settling Defendants shall not make any claim of privilege or protection regarding: (1) any data regarding the Site, including 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 Settling Defendants are required to create or generate in accordance with this Decree.

61. Confidential Business Information (CBI) Claims. A Settling Defendant may claim that all or part of a record provided to Plaintiff under this Section is CBI to the extent permitted by and in accordance with section 104(e)(7) of CERCLA and 40 C.F.R. § 2.203(b). Each Settling Defendant shall segregate and shall clearly identify all records or parts thereof submitted under this Decree which it claims is CBI by labeling each page or each electronic file "claimed as confidential business information" or "claimed as CBI." Records that a Settling Defendant claims to be CBI will be afforded the protection specified in 40 C.F.R. part 2, subpart B. If no CBI claim accompanies records when they are submitted to EPA, or if EPA notifies Settling Defendants that the records are not entitled to confidential treatment 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 Settling Defendants.

62. In any proceeding under this Decree, validated sampling or monitoring data generated in accordance with either the CCL SOW or Wallace SOW and reviewed and approved by EPA, if relevant to the proceeding, is admissible as evidence, without objection.

63. Notwithstanding any provision of this Decree, Plaintiff 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.

XVII. NOTICES AND SUBMISSIONS

64. All agreements, approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, waivers, and requests specified in this Decree must be in an electronic writing. Whenever a notice is required to be given or a report or other document is required to be sent by one Party to another under this Decree, it must be sent via email as specified below. All notices under this Section are effective upon receipt. There is a rebuttable presumption that emailed notices are received on the same day that they are sent. Any Party may change the person or email address applicable to it by providing notice of such change to all Parties.

As to DOJ: *via email to:*
eesdcopy.enrd@usdoj.gov
Re: DJ # 90-11-3-12111

As to EPA: *via email to:*
flynn.kathryn@epa.gov
and
bosque.adalberto@epa.gov
Re: Site/Spill ID # 02YP

As to the Region 2
Chief of Resource
Management/Cost
Recovery Section: *via email to:*
keating.robert@epa.gov
Re: Site/Spill ID # 02YP

As to Settling
Defendant HP: *via email to:*
christopher.dirscherl@hp.com
and
kdavis@foxrothschild.com

As to Settling
Defendant
Wallace: *via email to:*
rob.kay@lifetimebrands.com
and
john.mcgahren@morganlewis.com

As to Settling
Defendant
PRIDCO: *via email to:*
Carlos.rios@ddec.pr.gov
and
dbattle@cstlawpr.com

XVIII. APPENDIXES

65. The following appendixes are attached to and incorporated into this Decree:

“Appendix A” is the OU1 Record of Decision.

“Appendix B” is the CCL SOW.

“Appendix C” is the Wallace SOW.

XIX. MODIFICATIONS TO DECREE

66. Except as provided in ¶ 11 of the Decree and ¶ 7.6 of each SOW (Approval of Deliverables), nonmaterial modifications to Sections I through XXIII and the Appendixes must be in writing and are effective when electronically signed by the Parties. Material modifications to Sections I through XXIII and the Appendixes must be in writing, signed (which may include electronically signed) by the Parties, and are effective upon approval by the Court. As to changes to the OU1 remedy, a modification to the Decree, including either the CCL SOW or Wallace SOW, to implement an amendment to the OU1 Record of Decision that “fundamentally alters the basic features” of the Remedial Action within the meaning of 40 C.F.R. § 300.435(c)(2)(ii) will be considered a material modification.

XX. SIGNATORIES

67. The undersigned representative of the United States and each undersigned representative of a Settling Defendant certifies that he or she is fully authorized to enter into the terms and conditions of this Decree and to execute and legally bind such Party to this document.

XXI. PRE-ENTRY PROVISIONS

68. If for any reason the Court should decline to approve this Decree in the form presented, this Decree, except for ¶ 69 and ¶ 70, is voidable at the sole discretion of any Party and its terms may not be used as evidence in any litigation among the Parties.

69. This Decree will be lodged with the Court for at least 30 days for public notice and comment in accordance with section 122(d)(2) of CERCLA and 28 C.F.R. § 50.7. The United States may withdraw or withhold its consent if the comments regarding the Decree disclose facts or considerations that indicate that the Decree is inappropriate, improper, or inadequate.

70. Settling Defendants agree not oppose or appeal the entry of this Decree.

XXII. INTEGRATION

71. This Decree constitutes the entire agreement among the Parties regarding the subject matter of the Decree and supersedes all prior representations, agreements, and understandings, whether oral or written, regarding the subject matter of the Decree.

XXIII. FINAL JUDGMENT

72. Upon entry of this Decree by the Court, this Decree constitutes a final judgment under Fed. R. Civ. P. 54 and 58 among the Parties.

SO ORDERED this ____ day of _____, 20__.

United States District Judge

Signature Page for Consent Decree in *U.S. v. HP Inc. et al.* (D. P.R.)

FOR THE UNITED STATES:

Ellen M. Mahan
Deputy Section Chief
Environmental Enforcement Section
U.S. Department of Justice
Environment and Natural Resources Division

July 26, 2023

Dated

s/ Rachel Evans King

Rachel Evans King
Senior Counsel
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Enforcement Section
P.O. Box 7611
Washington, DC 20044-7611
202-514-5471
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W. Stephen Muldrow
United States Attorney
District of Puerto Rico

Lisa Bhatia
Assistant United States Attorney
District of Puerto Rico
Torre Chardón, Suite 1201
350 Carlos Chardón Street
San Juan, PR 00918

Signature Page for Consent Decree in *U.S. v. HP Inc. et al.* (D. P.R.)

**FOR THE U.S. ENVIRONMENTAL
PROTECTION AGENCY:**

Pat

Evangelista

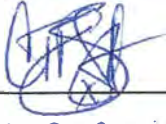
Digitally signed by Pat
Evangelista
Date: 2023.07.19 17:28:11
-04'00'

Pat Evangelista
Division Director
Superfund & Emergency Management Division
U.S. Environmental Protection Agency
Region 2

Signature Page for Consent Decree in *U.S. v. HP Inc. et al.* (D. P.R.)

FOR: HP Inc.

4/28/23
Dated


Name: _____
Title: DGC + BVP Litigation
Address: HP INC
1501 PAGE MILL RD
PALO ALTO, CA 94304

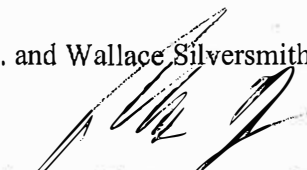
If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, this Settling Defendant agrees to accept service of the complaint by mail, and to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendant hereby designates the agent below to accept service of the complaint by mail and to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Karen H. Davis
Title: Partner
Company: Fox Rothschild LLP
Address: 747 Constitution Drive
Suite 100, Exton PA 19341-0673
Phone: 610-458-6702
email: Kdavis@foxrothschild.com

Signature Page for Consent Decree in *U.S. v. HP Inc. et al.* (D. P.R.)

FOR: Lifetime Brands, Inc. and Wallace Silversmiths de Puerto Rico, Ltd.

6/22/23
Dated



Name: Rob Kay
Title: CEO
Address: 1000 Stewart Ave.
Garden City, NY 11530

If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, this Settling Defendant agrees to accept service of the complaint by mail, and to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendant hereby designates the agent below to accept service of the complaint by mail and to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Rob Kay
Title: CEO
Company: Lifetime Brands, Inc.; Wallace Silversmiths de Puerto Rico Ltd.
Address: 1000 Stewart Avenue
Garden City, NY 11530
Phone: _____
email: rob.kay@lifetimebrands.com

Signature Page for Consent Decree in *U.S. v. HP Inc. et al.* (D. P.R.)

FOR: FOR PUERTO RICO INDUSTRIAL
DEVELOPMENT COMPANY


19 de julio de 2023

Dated


Name: Carlos Rios Pierluisi
Title: Deputy Chief Executive
Address: P.O. Box 362350
San Juan, PR 00936-2350

19 de julio de 2023

Dated


Name: Edil Barbosa
Title: Acting General Legal Counsel, Department of
Economic Development and Commerce
Address: P.O. Box 362350
San Juan, PR 00936-2350

If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, this Settling Defendant agrees to accept service of the complaint by mail, and to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendant hereby designates the agent below to accept service of the complaint by mail and to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Diana M. Battle-Barasorda, Esq.
Title: _____
Company: Casillas, Santiago & Torres, LLC
Address: El Caribe Office Building, 53 Calle Palmeras
Piso 16, Puerta de Tierra, San Juan, PR 00902
Phone: 787-523-3434
email: dbattle@cstlawpr.com

APPENDIX A

RECORD OF DECISION

**SAN GERMAN GROUNDWATER CONTAMINATION SUPERFUND SITE
SAN GERMAN, PUERTO RICO
OU-1**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

December 2015

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

San German Groundwater Contamination Superfund Site
OU-1 Source Control
San German, Puerto Rico
PRN000205957

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the selected remedial action for the Operable Unit 1 (OU-1) at the San German Groundwater Contamination Superfund Site (Site), located at the Municipality of San German, Puerto Rico, which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601-9675, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300.

The United States Environmental Protection Agency (EPA) expects to address the conditions at the Site through two separate operable units, OU-1 and OU-2, and thus two remedial actions, to address soil and groundwater contamination at the Site. OU-1 addresses soil contamination that acts as a continuing source of groundwater contamination, including soil in the vadose zone (above the water table) and soil and highly contaminated groundwater below the water table in the shallow saprolite zone (soils and highly weathered rock). The OU-1 areas also act as a source of vapors that can enter into buildings in the vicinity of the Retiro Industrial Park. By addressing these source areas first, EPA expects to begin to reduce the mass of contamination in the ground, thereby accelerating the overall groundwater cleanup. EPA intends to subsequently, in OU-2, address the Site-wide groundwater contamination as a second phase of the cleanup.

This decision document explains the factual and legal basis for selecting the remedy for OU-1 at the Site. This decision is based on the Administrative Record file for this remedy. Refer to Appendix II of Part II – Decision Summary for copy of the Administrative Record Index. The Puerto Rico Environmental Quality Board (EQB) concurs with the selected remedy. Refer to Appendix X of Part II – Decision Summary for copy of the concurrence letter.

ASSESSMENT OF SITE

EPA, in consultation with EQB, has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected remedy, may present a current or potential threat to human health and the environment. This determination is based on the conclusions of the Remedial Investigation (RI), Human Health Risk Assessment, and the Screening Level Ecological Risk Assessment. The media of concern at the Site are soil and groundwater. The sources of soil contamination in the southern area of the Site are on two properties, identified as “Wallace” and “CCL” in the Decision Summary, that are within the Retiro Industrial Park owned by Puerto Rico Industrial Development Company.

Based on the results of EPA’s RI, the groundwater contamination originates at the properties currently occupied by Wallace and CCL. Based on the results of the human health and ecological risk assessments conducted for the Site, a response action is necessary to protect the public health or welfare of the

environment. The selected remedy complies with federal and Commonwealth levels and standards of control that are legally applicable or relevant and appropriate requirements and is cost effective.

DESCRIPTION OF THE SELECTED REMEDY

EPA, in consultation with EQB, selects a remedy that will address the soil and a portion of the groundwater contamination detected at the Site. Under the selected remedy, soil contamination will be addressed at the Wallace and CCL properties by using soil vapor extraction (SVE) and dual-phase extraction (DPE)/*in-situ* treatment. Soil contamination within the vadose zone and soil and groundwater within the shallow saprolite zone will be addressed by implementing the selected remedy to remove volatile organic compounds (VOCs), coupled with long-term monitoring. The principal components of the selected remedy include the following:

- SVE to address soil (vadose zone) source areas at the Wallace and CCL lots;
- Impermeable cover as necessary for the implementation of SVE;
- DPE in the shallow saprolite zone; and
- *In-situ* treatment, such as enhanced anaerobic biodegradation, as needed to address residual sources.

INSTITUTIONAL CONTROLS

For as long as soil and groundwater contamination is still present at the Site, institutional controls are recommended to be implemented to help control and limit exposure to hazardous substances at the Site. Examples of the types of institutional controls that can be employed for the soil and groundwater at the Site are as follows: (1) existing local laws that limit installation of drinking water wells without a permit; (2) proprietary controls (e.g., easements/covenants) on all or parts of the Wallace and CCL properties to prevent soil excavation, well installation, or disturbance of the caps or other remedial measures; (3) informational devices such as advisories published in newspapers, periodic letters sent to local government authorities informing them of the need to prevent soil excavation and well installation; and (4) inspection of local and/or Commonwealth health department records to prevent wells from being installed that could impact the groundwater plume or result in exposure to contaminated groundwater.

EPA REGION 2 CLEAN AND GREEN POLICY

The environmental benefits of the preferred remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2 Clean and Green Energy Policy. This will include consideration of green remediation technologies and practices. Some examples of practices that would be applicable are those that reduce emissions of air pollutants, minimize fresh water consumption, incorporate native vegetation into revegetation plans, and evaluate beneficial reuse and/or recycling of materials, among others.

DECLARATION OF STATUTORY DETERMINATIONS

STATUTORY REQUIREMENTS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. Section 9621, because it meets the following requirements: (1) it is protective of human health and the environment; (2) it meets a level of standard of control of the hazardous substances, pollutants,

and contaminants that at least attains the legally applicable or relevant and appropriate requirements under the federal and State laws; (3) it is cost-effective; and (4) it utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

STATUTORY PREFERENCE FOR TREATMENT

The selected remedy meets the statutory preference for the use of remedies that involve treatment as a principal element.

FIVE-YEAR REVIEW REQUIREMENTS

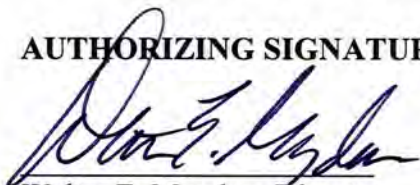
For soils, this remedy will not result in hazardous substances, pollutants, or contaminants remaining at the Site above levels that would allow for unlimited use and unrestricted exposure; however, because it may require more than five years to implement the remedy, EPA expects to conduct five-year reviews for OU-1 until the remedial action objectives are achieved within the vadose zone soils. The OU-1 remedy addresses the most highly contaminated portion of the groundwater plume, and it is anticipated that the OU-2 remedy will address the remainder of the groundwater plume. Therefore, the need for a five-year reviews for groundwater will be reassessed in OU-2.

ROD DATA CERTIFICATION CHECKLIST

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

- Contaminants of concern and their respective concentrations may be found in the "Site Characteristics" section.
- Potential adverse effects associated with exposure to Site contaminants may be found in the "Summary of Site Risks" section.
- A discussion of cleanup levels for chemicals of concern may be found in the "Remedial Action Objectives" section.
- A discussion of principal threat waste is contained in the "Principal Threat Waste" section.
- Current and reasonably-anticipated future land and groundwater use assumptions are discussed in the "Current and Potential Future Land and Groundwater Uses" section.
- Estimated capital, annual operation and maintenance, and total present worth costs are discussed in the "Description of Alternatives" section.
- Key factors that led to selecting the remedies (i.e., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decisions) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE



Walter E. Mugdan, Director
Emergency and Remedial Response Division
EPA - Region 2

December 11, 2015
Date

DECISION SUMMARY

**SAN GERMAN GROUNDWATER CONTAMINATION SUPERFUND SITE
OU-1 SOURCE CONTROL**

SAN GERMAN, PUERTO RICO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

DECEMBER 2015

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SITE NAME, LOCATION, AND DESCRIPTION

The San German Groundwater Contamination Superfund Site (Site) is located in San German, in southwestern Puerto Rico as shown in Figure 1 of Appendix VIII of this document. Volatile organic compounds (VOCs) were detected above federal maximum contaminant levels (MCLs) in three public water supply wells, Retiro, Lola Rodriguez de Tio I (Lola I), and Lola Rodriguez de Tio II (Lola II), located south of Guanajibo River, between Routes 139 and 360 (Figure 2 of Appendix VIII). These wells were associated with the Puerto Rico Aqueduct and Sewer Authority (PRASA) San German Urbano Water system, which includes a total of seven wells and two surface water intakes.

The Retiro, Lola I, and Lola II wells acted as an independent, interconnected supply system with approximately 800 service connections serving approximately 2,280 users in 2005. The Retiro well was located near the intersection of Route 122/Angel Castro Avenue and Guanajibo River, along the east side of a narrow, unnamed dirt road that leads to the riverbank. The Retiro well was destroyed when a new bridge was constructed across the Guanajibo River. Lola I is located near an entrance to the Lola Rodriguez de Tio public school. Lola II is located approximately 550 feet west-northwest of the Retiro well, south of Guanajibo River, on the south side of an unnamed dirt road adjacent to the river. According to PRASA, the individual mean output for each well in 2005 was approximately 398,000 gallons per day (gpd) from Retiro, 185,000 gpd from Lola I, and 170,000 gpd from Lola II.

The Site includes an industrial park owned by the Puerto Rico Industrial Development Company known as the Retiro Industrial Park, located approximately one-half mile to the southeast of the affected supply wells. Two lots within the Industrial Park have been determined to be the sources of the VOC contamination. Several of the buildings in the Industrial Park are occupied by active businesses that were investigated during the Remedial Investigation (RI).

The Site has been divided in two operable units (OUs). OU-1 addresses identified soil contamination that acts as a continuing source of groundwater contamination, including soil in the vadose zone (above the water table) and soil and highly contaminated groundwater below the water table in the shallow saprolite zone (soils and highly weathered rock). OU-2 will address the Site-wide groundwater contamination, which will be addressed in a second phase of the cleanup. This Record of Decision (ROD) addresses the selected remedy for OU-1.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 2001 to 2005, groundwater samples collected quarterly from the Retiro, Lola I, and Lola II wells regularly exhibited detectable concentrations of tetrachloroethene (PCE) and *cis*-1,2-dichloroethene (*cis*-1,2-DCE). The maximum concentrations of PCE and *cis*-1,2-DCE detected in these wells during this period were 6.4 micrograms per liter ($\mu\text{g/L}$) and 1.2 $\mu\text{g/L}$, respectively.

The Puerto Rico Department of Health (PRDOH) ordered PRASA to close the Retiro public drinking water supply well in January 2006 because of the presence of VOC contamination in the groundwater. PCE concentrations exceeded the federal MCL of 5 $\mu\text{g/L}$. PCE was also detected in tap water samples collected from the water distribution system. PRASA responded to this order

by taking the Retiro well out of service on January 19, 2006. The Lola I and Lola II wells were taken out of service in about the same time period because of exceedances in levels in those wells, too.

EPA added the Site to the National Priorities List (NPL) on March 19, 2008. The RI and Feasibility Study (FS) for the Site have been funded by EPA.

EPA POTENTIAL SOURCE AREA INVESTIGATION

In June 2006, EPA collected groundwater samples from operational wells and analyzed for target compound list (TCL) and target analyte list (TAL) contaminants, confirming the presence of PCE (1.6 µg/L), *cis*-1,2-DCE (1.5 µg/L), and trichloroethene (TCE) (0.54 µg/L). In addition, PCE was detected at an estimated concentration (below the sample quantitation limit) in the Lola II well. EPA was unable to collect a sample from the Retiro well because the pump was removed in February 2006 in response to PRDOH's shutdown order. Background groundwater samples, collected upgradient of the Retiro Industrial Park, revealed no detections for PCE, *cis*-1,2-DCE, and TCE.

In July 2006, EPA conducted reconnaissance activities at 44 industrial properties in the San German area as part of a site discovery initiative to identify hazardous waste sites that could be sources of contamination. This led to the identification of several locations in San German that were investigated further as part of the RI.

Potential source area (PSA) investigations were performed at five facilities in February and May 2012. Soil samples were collected at 0 to 2 feet, 5 to 7 feet, 10 to 12 feet, 20 to 22 feet and 30 to 32 feet (if accessible). Soil samples were analyzed for TCL VOCs, semi-volatile organic compounds, pesticides, polychlorinated biphenyls, and TAL inorganics including mercury and cyanide. A total of 41 borings were completed at five PSAs; 159 soil samples were collected.

Two out of the five facilities were identified as sources of soil contamination that reached the groundwater and formed separate and co-mingled PCE and TCE plumes. It was determined that these plumes resulted in the contamination observed in the three former supply wells. The two identified properties are currently occupied by Wallace Silversmiths de Puerto Rico, Ltd. (Wallace), and CCL Insertco de PR (CCL). These lots are referred to as the Wallace lot and the CCL lot. Wallace currently occupies two buildings. In the past, Wallace occupied a nearby building that was investigated as part of the RI. High levels of PCE were present in a majority of soil samples collected at the two buildings currently occupied by Wallace. TCE and *cis*-1,2-DCE were also frequently detected, but at lower levels. At the former Wallace building, PCE was detected in some soil samples and TCE and *cis*-1,2-DCE were detected much less frequently and at low levels.

CCL occupies a building to the east of the current Wallace facilities. Samples collected in the CCL building reflected concentrations of TCE at higher levels than PCE in soil samples. In addition, *cis*-1,2-DCE was frequently detected, generally at lower levels than TCE. PCE was rarely detected.

EPA REMEDIAL INVESTIGATION/FEASIBILITY STUDY

The nature and extent of contamination in Site media was assessed during the RI by collecting and analyzing samples and then comparing analytical results to federal, Commonwealth, and Site-specific screening criteria. Five chemicals were identified as Site-related contaminants: PCE, TCE, *cis*-1,2-DCE, 1,1-dichloroethene (1,1-DCE) and vinyl chloride. These five VOCs were detected the most frequently, and at the highest levels, in source area soil samples and other affected media including groundwater, surface water, and sediment. These chemicals include chlorinated solvents and degradation products of those solvents. The RI also investigated the Site for the presence of Site contaminants in the form of non-aqueous phase liquids (NAPLs). Site contaminants are chlorinated VOCs that are denser than water, so are also referred to as dense non-aqueous phase liquids (DNAPLs).

It should be noted that OU-2 is ongoing and will gather additional information that will allow EPA to address the groundwater contamination fully in a subsequent remedy (OU-2). Some of the data obtained during the OU-1 RI is groundwater data, and it is being presented in this document in order to show the impact to the groundwater from the contaminated soil at the identified sources.

An RI Report was prepared by EPA to document the nature and extent of the contamination at the Site. EPA also issued a Baseline Human Health Risk Assessment (HHRA) Report to document the current and future effects of Site contaminants on human health and the environment associated with the contamination found at the Site. EPA also conducted a Screening-level Ecological Risk Assessment (SLERA) to evaluate any potential for ecological risks from the presence of Site contaminants in surface water and sediment. A detailed description of the HHRA and SLERA for this Site is provided in the Summary of Risk Section of this ROD.

An FS was conducted and a FS Report was prepared to present and analyze cleanup alternatives suitable for OU-1 at the Site. The purpose of the FS Report was to identify, develop, screen, and evaluate a range of remedial alternatives that protect human health and the environment from potential risks at OU-1 and enable EPA to select a remedy for OU-1. A detailed description of the cleanup alternatives evaluated for OU-1 is provided in the Description of Alternatives Section of this ROD.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the RI, a Community Involvement Plan (CIP) was developed to assess any community concerns about the Site and encourage public participation. As part of the CIP and as required by Superfund regulations, EPA prepared a Proposed Plan for the Site (Appendix I). The Proposed Plan summarizes the remedial alternatives and identifies EPA's preferred alternative and the rationale for the preferred remedy. On August 12, 2015, EPA made available to the public the Proposed Plan, the RI Report, the HHRA and SLERA Reports, and the FS Report for OU-1. All of these documents along with others are included in the Administrative Record for this remedy were made available to the public at the following locations: EPA's Docket Room in New York, New York; San German City Hall; EQB's Superfund File Room in San Juan, Puerto Rico; and EPA's Caribbean Environmental Protection Division Office in Guaynabo, Puerto Rico. A copy of the Administrative Record Index for the Site is provided in Appendix II of this ROD.

A notice of the availability of the Proposed Plan and supporting documentation was published in the “Primera Hora” newspaper on August 12, 2015 (Appendix III). In order to facilitate the communication with the community, a Fact Sheet (in Spanish) was prepared and distributed throughout the community (Appendix IV). A public comment period was held from August 12, 2015, to October 24, 2015. In addition, a public meeting was held on August 19, 2015 at the Santa Marta Basketball Court from 6:00 pm to 8:00 pm. The purpose of the public meeting was to present the Proposed Plan to the community and provide an opportunity for the public to ask questions or give comments on the proposed remedial alternatives described in the Proposed Plan and EPA’s preferred alternative. At this meeting, representatives from EPA and EQB answered questions and received comments about the remedial investigation activities conducted at the Site and the proposed remedial alternative for the Site. A copy of the attendance sheet for this meeting can be found in Appendix V of this ROD. Appendix VI of this ROD contains the official transcript of the public meeting. In addition, EPA’s response to written comments received during the public comment period is included in the Responsiveness Summary (Appendix VII).

SCOPE AND ROLE OF RESPONSE ACTION

EPA is addressing the cleanup of this Site in two phases, OU-1 and OU-2. This remedy is the first of two anticipated remedial actions for the Site, with OU-1 addressing contaminated soils and shallow, highly contaminated groundwater that acts as ongoing sources of groundwater contamination. The OU-1 source areas also act as a source of vapors that can enter into buildings in the vicinity of the Retiro Industrial Park. By addressing the source areas first, EPA expects to begin to reduce the mass of contamination in the ground, thereby accelerating the overall groundwater cleanup. As discussed below, further investigation of the diffuse groundwater plume (OU-2) is still needed before a remedy for OU-2 can be selected. By selecting and implementing the OU-1 remedy, EPA will be able to begin to address the Site contamination while completing the OU-2 studies.

Because of the potential for subsurface VOC vapors entering and affecting current occupants of several buildings at the Retiro Industrial Park, EPA is conducting a separate action to address vapor intrusion, using the EPA’s removal action, or emergency response, authority. EPA is coordinating its remedial and removal actions so that the removal actions will not be inconsistent with EPA’s final remedies selected for the Site.

SITE CHARACTERISTICS

CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) was developed for the Site to integrate the different types of information collected during the RI, including geology, hydrogeology, background, setting, and the fate and transport of contaminants. Based on the Site-specific geology, hydrogeology, physical and chemical properties of the Site-related contaminants, and the fate and transport of the contaminants, the CSM was developed, which is summarized below and illustrated in Figure 3 and Figure 4 of Appendix VIII.

The two main sources of soil contamination were identified at the Wallace lot and the CCL lot. Contamination at the Site can be linked to previous releases and discharges to the environment from these lots. Based on the high levels of PCE at the Wallace source area and the high levels of TCE at the CCL source area, PCE and TCE are assumed to have been released to the ground as raw or waste product. The soil data indicate that significant mass of PCE and/or TCE and degradation daughter products are retained by capillary forces in the pores of soil, primarily in the unsaturated zone in the Wallace and CCL lot source areas. These contaminants have migrated downward to deeper subsurface soils and into the groundwater causing the formation of separate and co-mingled PCE and TCE plumes.

EPA has determined that both properties are the source of documented groundwater contamination at the Site, resulting in the contamination observed in the three former PRASA public water supply wells. Saprolite zone monitoring wells located at the source areas (MW-2S, MW-3S, MW-4S, and MW-5S) have consistently shown high concentrations of PCE and TCE. The predominant groundwater flow direction in the Guanajibo River alluvial valley is preferentially toward the river, as the tributary streams to the Guanajibo River likely act as aquifer drains. However, the PCE and TCE groundwater plumes are oriented southeast/northwest suggesting the pumping influence of the supply wells. Since the shutdown of the public supply wells, the groundwater flow regime may have changed, and flow may no longer be strongly drawn toward the supply wells but more northerly toward the river. Dissolved contaminants in the saprolite zone may enter the bedrock groundwater through bedding planes and fractures, although it is currently unknown whether contamination is present in the highly fractured and unstable upper bedrock, a zone identified during the RI as the “Unstable Zone,” and discussed in more detail, below.

EPA conducted vapor intrusion sampling in numerous residential structures and industrial buildings. Results indicate that volatilization is an active process in the unsaturated zone throughout the Site. The PCE and TCE concentrations in the sub-slab soil gas samples were extremely high and above EPA’s vapor intrusion screening levels, especially at the Wallace facility. On the other hand, PCE and TCE concentrations in indoor air samples were below their respective screening levels. The surface water results indicate that rainwater percolating through contaminated soil or contaminated groundwater is likely discharging into surface water near the CCL and Former Baytex buildings. Adjacent to the Río Guanajibo and directly north of the source areas, PCE was detected, albeit at a low level (0.77 ug/L), in one pore water sample.

SITE OVERVIEW

Topography and Drainage

San German is located in the eastern part of the Río Guanajibo floodplain. Within the municipality, the river drops from an elevation of approximately 155 feet above mean sea level in the east to approximately 115 feet in the west. The river valley is flanked to the north and south by uplands; the highest point in the area is 735 feet, at a hilltop 0.75 mile south of the public supply wells. Uplands north of the river are as high as approximately 280 feet. The three former public supply wells are located adjacent to the river on the south side, at an approximate elevation of 138 feet.

The Guanajibo River flows west through the town of San German and is the major surface water

body in the area. The Guanajibo River drainage basin encompasses an area of approximately 35 square miles. A tributary to the Guanajibo River originates in the highlands southeast of the Site and flows west, then north, toward the river, discharging near the northwest corner of the Santa Marta neighborhood between Route 102 and the river.

Geology

The study area lies within the eastern part of the Guanajibo River floodplain, which is bounded to the north and south by highlands of predominantly igneous rocks and serpentinite (metamorphic). Bedrock is overlain by alluvial deposits in the river valley, and it is generally encountered at the surface in the highlands and at depths up to 100 feet below ground surface (bgs) in the river valley.

Within the monitoring well network, the shallowest deposits are the alluvial soils (Quaternary), also known as the overburden. These deposits are present in the Guanajibo River valley and along tributaries, consisting of gravel, fine sands, silty clay, clayey silt, and clay. Unsaturated and saturated deposits are generally less than 100 feet thick. The unsaturated zone varies across the Site from less than 10 feet bgs to 38 feet bgs. The relatively high percentage of low permeability soils in the unsaturated zone results in semi-confined conditions at the top of the water table, as evidenced by the observed rise in the level of the groundwater in soil borings and in cased monitoring wells.

Underlying the alluvial soils is the saprolite zone. The saprolite is composed of saturated sands, silts, clays, and highly weathered rock with an increasing percentage of rock fragments with depth. The saprolite is heterogeneous with varied content of highly weathered rock and rock fragments; drilling encountered dry conditions at different depths at different locations. The water table is generally encountered at or near the top of the saprolite zone, and the transmissivity increases with depth in the saprolite as the percentage of rock fragments increases.

The Unstable Zone is composed of highly fractured and unstable bedrock just below the saprolite zone. The high degree of fracturing means this zone was unstable during drilling, and the bedrock borehole would not remain open. During drilling of Site monitoring wells, this zone required double and triple casing in order to proceed with deeper drilling. This zone was also observed to produce a lot of water during drilling. No groundwater samples were collected during installation of monitoring wells; therefore, contaminant levels are unknown. The Unstable Zone ranges from 32 to 70 feet thick across the Site and ranges from 50 to 90 feet bgs. This zone is assumed to have a relatively high rate of groundwater flow based on the volume of water produced during drilling and on its highly fractured characteristics.

The bedrock underlying the Site is composed of highly fractured and faulted serpentinite or serpentinitized peridotite of late Jurassic and early Cretaceous age or older. This zone is represented by more competent bedrock that was stable enough to maintain an open borehole after drilling. The bedrock zone is composed of fractured rocks that were evaluated with borehole geophysical methods to determine the orientation of fractures and in-flow and out-flow zones, as described in the RI Report. Joints and fractures were most commonly noted with northeast and northwest strikes and with dip toward the north. Multiport systems were installed in seven bedrock boreholes to allow for monitoring well sampling at multiple depths.

Hydrogeology

The aquifer within the study area is part of the Río Guanajibo alluvial valley. Groundwater is first encountered in the saprolite, and the depth to water ranges from river level at Río Guanajibo to about 15 to 25 feet bgs at higher elevations. The saprolite zone and bedrock are connected and form one aquifer. The Unstable Zone appears to be highly transmissive, based on the large amounts of water produced during drilling. This zone is likely composed of serpentinite similar to the underlying fractured bedrock zone; however, this layer has been too unstable to support well installation, and further investigations of this layer are required as part of the OU-2 RI/FS.

The general direction of groundwater flow from the identified contaminant source areas is to the north-northwest, and there is some indication that the aquifer is hydraulically connected to Río Guanajibo. The straight alignment of the monitoring wells (from Retiro Industrial Park to the supply wells) makes it difficult to determine the exact direction of groundwater flow. It is possible that pumping at the supply wells when they were active influenced localized groundwater flow direction toward the northwest. Observations of PCE and/or TCE contamination in private wells in the residential area (northwest of Retiro Industrial Park) and in one pore water sample from the Río Guanajibo to the north of the residential area indicate groundwater also flows in a more northerly direction and that groundwater discharges to the river. Groundwater flow occurs under both semi-confined and unconfined-conditions. Unconfined conditions predominantly occur in local areas where the alluvium is relatively thin and the thickness of the surface and subsurface clay and silt is minimal. The occurrence of semi-confining conditions within the unconsolidated deposits generally increases west of the town of San German as the depth to basement rock and the thickness of both surface and subsurface clay and silt strata increase. Vertical gradients in bedrock and saprolite zone well clusters indicate the presence of a slight upward gradient.

Cultural Resources

A Cultural Resource Survey (CRS) was performed during the RI for the Site to assess the archaeological sensitivity in the area of potential effects (APE). The APE for the Site consists of an approximately 440-acre Cultural Resource Study Area in the Municipality of San German in the Guanajibo Valley section of Puerto Rico.

A Stage 1A CRS was conducted within the APE for the Site. The primary goal of the Stage 1A cultural resources survey was to assess the archaeological sensitivity of the APE. Portions of the APE were identified to possess high and moderate sensitivity for archaeological resources as shown in Appendix H of the RI Report based on cartographic evidence and field reconnaissance. The Stage 1A CRS recommended that a Stage 1B CRS be performed in areas where subsurface disturbance for remediation is planned within zones of high or moderate archaeological sensitivity. Because the two source areas in Retiro Industrial Park are within the APE area of low sensitivity, no additional CRS activities are necessary for OU-1.

Sampling Strategy

As part of the fund lead RI, soil, groundwater, surface water, sediment, and soil vapor were

sampled at numerous locations at the Site. Sampling was conducted at the following properties: Wallace, Pitusa, Former Baytex, CCL, and Acorn Dry Cleaner. In addition, soil vapor samples were collected in some residences within the area. Two rounds of sub-slab soil vapor sampling were performed. Some of the data obtained during the OU-1 RI is groundwater data, and it is being presented in this document in order to show the impact to the groundwater from the contaminated soil at the identified sources. The groundwater contamination is intended to be fully addressed in OU-2. Surface water, pore water, and sediment samples were collected from the Guanajibo River and its tributaries, as well as from catch basins adjacent to Retiro Industrial Park.

The results of these sampling events are discussed below.

Soil Sampling Results

PCE and TCE were frequently detected at elevated levels at the Wallace lot (Figure 5). PCE was detected in nearly every sample. The highest concentration was 46,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$). The highest concentration of TCE was 2,300 $\mu\text{g}/\text{kg}$. *Cis*-1,2-DCE, vinyl chloride, and 1,1-DCE were detected less frequently than TCE.

PCE was frequently detected below the screening criterion at the Pitusa property (Figure 6). One concentration exceeded the criterion at 130 $\mu\text{g}/\text{kg}$. TCE, *cis*-1, 2-DCE, and 1, 1-DCE detections were below the screening criteria.

PCE was detected frequently but was generally below the screening criterion at the Former Baytex property (Figure 7). Six samples exceeded the criterion, with the highest detection at 180 $\mu\text{g}/\text{kg}$. TCE, and *cis*-1, 2-DCE did not exceed criteria.

- PCE was detected in three samples at the CCL lot (Figure 8); one detection, at 71 $\mu\text{g}/\text{kg}$, exceeded the screening criterion. In contrast to other soil results, TCE at the CCL lot was more frequently detected than PCE. TCE was in 23 of 39 samples with a maximum of 3,600 $\mu\text{g}/\text{kg}$. *Cis*-1,2-DCE was generally lower than TCE. The highest *cis*-1,2-DCE concentration was 4,400 $\mu\text{g}/\text{kg}$. Vinyl chloride was detected in five samples; the highest concentration was 520 $\mu\text{g}/\text{kg}$.
- PCE was detected at a property occupied by Acorn at very low levels (less than 1 $\mu\text{g}/\text{kg}$) in two samples and was not detected in two samples (Figure 9). TCE and *cis*-1,2-DCE results showed low level detections and no detections. Vinyl chloride and 1,1-DCE were all not detected.
- In addition to the VOCs described above, soil sampling identified metals, including chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium and zinc, throughout the soil column. Metals were found at statistically similar levels across the Site, suggestive of a distribution of metals associated with the local soil (natural background) rather than attributable to a release.

Summary of Soil Vapor Contamination

- PCE was detected in 41 of 44 sub-slab samples collected in the first of two rounds, and exceeded the screening criterion of 94 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in 10 samples,

7 of which were at two properties, Wallace and the former Baytex facility. PCE detections ranged from 0.04 $\mu\text{g}/\text{m}^3$ to 27,000 $\mu\text{g}/\text{m}^3$. The highest detection was at the former Baytex facility property.

- TCE was detected in 16 sub-slab samples and exceeded the screening criterion of 4.3 $\mu\text{g}/\text{m}^3$ in 10 samples, all of which were at the Baytex and CCL properties. TCE detections ranged from 0.041 $\mu\text{g}/\text{m}^3$ to 7,100 $\mu\text{g}/\text{m}^3$. The highest detection was at the CCL lot.
- In the 39 indoor air samples, PCE was detected in 23 samples, none of which exceeded the screening criterion of 9.4 $\mu\text{g}/\text{m}^3$. PCE detections ranged from 0.048 $\mu\text{g}/\text{m}^3$ to 1.7 $\mu\text{g}/\text{m}^3$.
- TCE was detected in 5 indoor air samples and exceeded the 0.43 $\mu\text{g}/\text{m}^3$ screening criterion in 1 sample at a facility within the industrial park. TCE detections ranged from 0.043 $\mu\text{g}/\text{m}^3$ to 0.88 $\mu\text{g}/\text{m}^3$.
- In the 43 sub-slab samples collected as part of the second round, PCE was detected in all samples and exceeded the screening criterion of 94 $\mu\text{g}/\text{m}^3$ in 31 samples, 28 of which were at the Baytex, CCL and Wallace properties. PCE detections ranged from 1.42 $\mu\text{g}/\text{m}^3$ to 14,200,000 $\mu\text{g}/\text{m}^3$. The highest detection was at the Wallace lot.
- TCE was detected in 42 samples in the second round and exceeded the screening criterion of 4.3 $\mu\text{g}/\text{m}^3$ in 10 samples, all of which were at the Baytex, CCL and Wallace properties.
- TCE detections ranged from 0.195 $\mu\text{g}/\text{m}^3$ to 726,000 $\mu\text{g}/\text{m}^3$. The highest detection was at the Wallace lot.
- In the 33 indoor air samples collected in the second round, PCE was detected in 23 samples, none of which exceeded the 9.4 $\mu\text{g}/\text{m}^3$ screening criterion. PCE detections in indoor air samples ranged from 7.46 $\mu\text{g}/\text{m}^3$ to 0.317 $\mu\text{g}/\text{m}^3$.
- TCE was detected in 21 samples and exceeded the 0.43 $\mu\text{g}/\text{m}^3$ screening criterion in 10 samples. TCE detections ranged from 0.167 $\mu\text{g}/\text{m}^3$ to 2.11 $\mu\text{g}/\text{m}^3$. The highest concentration was detected in a residence. Using a non-cancer TCE criterion of 2.0 $\mu\text{g}/\text{m}^3$, one sample exceeded this criterion. At this location, the indoor sample result was higher than the subslab result, indicating the probability of an indoor source for the TCE.

Summary of Groundwater Contamination

Further investigations will be required to fully delineate the groundwater plume as part of the OU-2 RI/FS, particularly with regard to the Unstable Zone. Groundwater findings discussed below are included here to support the need for a source control remedy (OU-1).

- Nine of ten soil borings at Wallace encountered groundwater (Figure 5). PCE was elevated in seven samples; the highest was 7,960 $\mu\text{g}/\text{L}$. TCE was detected in eight samples with a high of 900 $\mu\text{g}/\text{L}$. The highest detections of *cis*-1,2-DCE, vinyl chloride, and 1,1-DCE were 1,310 $\mu\text{g}/\text{L}$, 190 $\mu\text{g}/\text{L}$, and 72 $\mu\text{g}/\text{L}$, respectively.
- Nine of the ten borings at CCL encountered groundwater (Figure 8). PCE was detected in four samples; the maximum concentration was 450 $\mu\text{g}/\text{L}$. TCE and *cis*-1,2-DCE were detected in all nine samples. The maximum concentrations were 27,700 $\mu\text{g}/\text{L}$ and 5,560 $\mu\text{g}/\text{L}$, respectively. Vinyl chloride and 1,1-DCE were each detected in one sample at 25.2 $\mu\text{g}/\text{L}$ and 1.89 $\mu\text{g}/\text{L}$, respectively.
- Forty-three groundwater samples were collected at 37 locations along 11 transects (Figure 10) between the Retiro Industrial Park in the southeast and the closed public supply wells to the northwest. PCE was detected in most samples except transects T0 and T1, with the

highest concentration in transect T3 at 26,800 µg/L. TCE was frequently detected, including in transects T0 and T1 where PCE was not detected. The highest concentration was in transect T2 at 65,400 µg/L. Detections of *cis*-1,2-DCE were similar to TCE with the highest concentration in transect T4 at 203 µg/L. Vinyl chloride was detected in two samples, one each from transects T1 and T4; the maximum concentration was 6.41 µg/L. 1,1-DCE was frequently detected in transects T3 through T8 (except T6); the highest concentration was 126 µg/L.

- PCE was detected in groundwater samples at all nine shallow wells sampled (Figure 11); the highest concentration was in MW-2S at the Wallace source area (13,000 µg/L). PCE concentrations decrease as the plume migrates downgradient to the northwest toward the public supply wells.
- TCE concentrations were the highest in MW-3S at CCL (1,700 µg/L) with levels rapidly decreasing to the northwest in the aligned monitoring well network.
- Two *cis*-1,2-DCE concentrations exceeded the screening criterion, with the highest in MW-3S at CCL (220 µg/L) and the second exceedance in MW-5S at 100 µg/L.
- Vinyl chloride was detected in 2 monitoring wells, with a maximum concentration of 47 µg/L in MW-3S.
- 1,1-DCE was detected in seven of the nine shallow monitoring wells; the highest concentration was in MW-6S at 41 µg/L. Two detections exceeded the screening criterion.

Summary of Surface Water/Sediment Contamination

- In the river/tributary surface water samples (Figure 12) collected in August 2014 showed PCE detection in samples SW-10 through SW-12; the highest detection was 14 µg/L in SW-12. TCE, *cis*-1,2-DCE, and vinyl chloride were detected in SW-9 through SW-12, with the highest at 42 µg/L, 37 µg/L, and 21 µg/L, respectively. 1,1-DCE was detected at trace levels in these four samples.
- In January 2014, surface water samples were collected at locations SW-9 through SW-12. The maximum detections of PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride were 32 µg/L, 98 µg/L, 36 µg/L, 0.55 µg/L and 8.7 µg/L, respectively. These four samples were collected from a small drainage channel on the northeastern side of the CCL and Former Baytex buildings in the industrial park.
- In catch basin water samples, PCE was detected in three samples; one exceeded the screening criterion at 88 µg/L at CBSW-4. All other detections were below 1 µg/L. TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride were detected in the same four samples, with the highest at 15 µg/L, 9.2 µg/L, 0.17 µg/L, and 1.8 µg/L, respectively. Three of the TCE detections exceeded the screening criterion and all of the vinyl chloride detections exceeded its criterion.
- In addition to the VOCs described above, soil sampling identified metals, including chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium and zinc, throughout the soil column. Metals were found at statistically similar levels across the Site, suggestive of a distribution of metals associated

Sources of Contamination

Two source areas were identified during the RI. They are the Wallace lot and the CCL lot . Both

source areas are in the Retiro Industrial Park and have significant soil contamination.

Wallace Source Area

The Wallace lot has been identified as a source of both soil and groundwater chlorinated VOC contamination. The Wallace soil results were dominated by detections of PCE, which was detected in 37 of 42 samples. Both surface and subsurface soil is contaminated, with PCE contamination in surface soil as high as 46,000 µg/kg (1,000 times the screening criterion) and subsurface soil, with PCE contamination exceeded its screening criterion in samples collected from 20-22 feet bgs (just above or near the water table). Other chlorinated VOCs, including TCE, *cis*-1,2-DCE, and vinyl chloride, were detected in soil samples.

The highest levels of soil contamination were detected in the narrow area where the two Wallace facility buildings are connected, and on the south side of the eastern-most of those two buildings. Groundwater screening samples collected at the top of the water table in soil borings indicated that the soil contamination has migrated into groundwater, forming a significant plume that flows with groundwater toward the north-northwest. Several soil borings had limited chlorinated VOC detections in the soil, but had elevated levels of PCE in groundwater (e.g., borings WS-02 and WS-07). This pattern may indicate that some of the shallow groundwater contamination originates on the southeastern part of the Wallace lot and has begun to flow with groundwater beneath the Wallace facility buildings.

CCL Source Area

The CCL lot has been identified as a source of both soil and groundwater chlorinated VOC contamination. At the CCL lot source area, soil contamination was dominated by detections of TCE rather than PCE, with TCE detected in 22 of 36 soil samples. Generally, the detections of site-related contaminants were low in shallow soil samples (less than 10 feet deep), with levels increasing with depth. The highest TCE detection was 3,600 µg/kg (100 times the screening criterion) in boring CCL-1, adjacent to groundwater screening transect location T2-2. The shallow soil samples had no TCE; the two deeper samples (10-12 feet and 20-22 feet bgs) had high levels of TCE, along with high TCE (27,700 µg/L – more than 5,500 times the screening criterion) in the grab groundwater sample.

Overall, contamination is concentrated in two areas, around soil boring CCL-1, near the woods on the east side of the CCL facility building, and around boring CCL-8, near the southeastern end of the facility building. Other soil borings on the east side of the facility building had no or very low detections of chlorinated VOCs, indicating that the soil contaminated area may be limited to a few location on the east side of the facility building.

Types of Contaminants and Migration

The primary Site-related contaminants include five chlorinated VOCs, namely TCE, PCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. The fate of a chemical in the environment is a function of its physical and chemical properties and conditions at the Site. The potential for environmental transport is a function of site conditions, including the geological and hydrogeological

characteristics. The primary fate and transport aspects are summarized below.

- PCE, TCE, and their degradation daughter products have migrated from the ground surface through the overburden zone and into groundwater. Some of the PCE and TCE mass is retained by capillary forces in the soil pores. The concentrations of PCE and TCE identified in the saturated zone indicate the potential for the presence of DNAPL, although DNAPL was not observed during sample collection.
- The greatest potential for the transport of the chlorinated VOCs is through continuous dissolution of contaminants in soil and vertical migration to groundwater, and then groundwater migration, and eventual volatilization.
- Dissolved contaminants move with the groundwater flow in the saprolite zone to the north-northwest toward the former supply wells and the Río Guanajibo. Dissolved contaminants in the saprolite zone may enter the bedrock groundwater through bedrock bedding planes and fractures. It is currently unknown whether contamination is present in the highly fractured and unstable upper bedrock (the Unstable Zone).
- Chlorinated VOCs in soil and groundwater have also migrated as vapor. Vapor intrusion sample results confirm the presence of vapor beneath buildings and structures in the vicinity of the groundwater plume. VOC vapors detected within the interior of buildings were below risk-based screening criteria.
- Based on an evaluation of natural attenuation, discussed below, there is limited evidence that anaerobic biodegradation of chlorinated VOCs is occurring at the Site. However, the frequent detections of *cis*-1,2-DCE and less frequent detections of *trans*-1,2-DCE, vinyl chloride, and 1,1-DCE are indicative of active (if incomplete) biodegradation in the aquifer.

Assessment of Natural Attenuation at the Site

Natural attenuation refers to the naturally occurring processes in soil and groundwater, including biodegradation, by subsurface microorganisms, reactions with naturally occurring minerals, and sorption on geologic media. These processes can achieve a reduction in the total mass, toxicity, mobility, volume, or concentration of contaminants. If testing indicates that conditions are favorable for natural attenuation at a site, EPA can consider relying on monitored natural attenuation (MNA) as a remedy, or as a component to a remedy.

During the RI investigation at the Site, MNA indicator parameters were collected and analyzed in the field or by an off-site laboratory in order to evaluate whether subsurface conditions are conducive to *in-situ* natural degradation of chlorinated VOCs. MNA field parameters included pH, specific conductivity, dissolved oxygen, temperature, oxygen reduction potential, and ferrous ion. MNA parameters were analyzed from multiple bedrock ports and saprolite zone monitoring wells, following EPA MNA protocols.

Based upon findings to date, there is inadequate to limited evidence that anaerobic biodegradation of chlorinated VOCs is occurring at the Site. The TCE plume displayed some reductive dechlorination in the source area near MW-3S. However, the PCE plume displayed only weak indications of reductive dechlorination. Consequently, there is inconclusive evidence that complete and sustainable reductive dechlorination of chlorinated VOCs has occurred at the Site. Given the high concentrations found in the source areas, MNA cannot be supported as a remedial

component for OU-1. MNA will be further evaluated as part of the OU-2 RI/FS to determine whether it may be effective at addressing portions of the TCE and PCE plumes after the source areas have been addressed as part of OU-1.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The San German municipality is comprised of 54.51 square miles with a population of 35,527 and a population density of 651.8 people per square mile (U.S. Census 2010). The primary land use in the vicinity of the San German site is agricultural with some residential, commercial, and light industrial development. The population currently served by the seven PRASA supply wells that remain open is 14,000 people. The Retiro Industrial Park, the eventual focus of the OU-1 RI/FS, is a mixture of commercial and light industrial enterprises. These land uses are not anticipated to change in the future.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The remedial alternative that is being chosen for the Site addresses contamination at the Site. The risks and hazards posed by the Site was presented in the baseline risk assessment are summarized in this section.

HUMAN HEALTH RISK ASSESSMENT

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification – in which EPA uses the analytical data collected to identify the contaminants of potential concern at a site for each medium, with consideration of a number of factors explained below; Exposure Assessment - in which EPA estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed; Toxicity Assessment - in which EPA determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and Risk Characterization - in which EPA summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations that exceed acceptable levels, as defined by the NCP and discussed below as posing either an excess lifetime cancer risk greater than the range from 1×10^{-6} to 1×10^{-4} , an excess of lifetime cancer risk greater than 1×10^{-6} (i.e., the point of departure) combined with site-specific circumstances, or a Hazard Index greater than 1. Contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at a site. Also included in this section is a discussion of the uncertainties

associated with such risks.

HAZARD IDENTIFICATION

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. The risk assessment focused on surface soil, subsurface soil, surface water, sediment, air, and groundwater contaminants related to the Site which may pose significant risk to human health and the environment. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs in the soil and groundwater at concentrations of potential concern.

A comprehensive list of all COPCs can be found in the baseline human health risk assessment (BHHRA), entitled “Final Human Health Risk Assessment - San German Groundwater Contamination Site,” dated July 2015. This document is available in the Administrative Record file. This ROD focuses on a site-wide evaluation, which includes the Río Guanajibo and five industrial properties, namely Wallace, CCL, Pitusa-National Lumber, the former Baytex facility, and Acorn Dry Cleaners. The contaminated media, concentrations detected, and concentrations utilized to estimate potential risks and hazards for the COCs at the Site are presented in Table 1 of Appendix IX. Soil and groundwater were the media that contained COCs.

EXPOSURE ASSESSMENT

Consistent with Superfund policy and guidance, the BHHRA is a baseline human health risk assessment and assesses conditions under the assumption that no remediation or institutional controls will be implemented to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure expected to occur under current and future conditions at the site. That exposure is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeded the acceptable levels, the central tendency estimate, or the average exposure, was also evaluated.

The industrial sites in the Retiro Industrial Park are currently zoned for industrial use, however, there are residential areas in the vicinity of the industrial facilities and overlying the groundwater plume area, and the Río Guanajibo river may be used for recreational activities. The BHHRA evaluated potential risks to populations associated with both current and potential future land uses.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to surface soil, subsurface soil, surface water, sediment, air, and groundwater. Exposure pathways assessed in the BHHRA are presented in Table 2 and included current exposure to industrial workers, trespassers, and recreators and future exposure to industrial workers, trespassers, residents, construction workers and recreators through incidental ingestion, dermal contact, and inhalation from contaminated media on the five subareas and Río Guanajibo. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound estimate of the average concentration for each contaminant, but

in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in groundwater can be found in Table 2 of Appendix IX to this ROD, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

TOXICITY ASSESSMENT

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards as a result of exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database, or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information for the COCs is presented in Table 3 (noncancer toxicity data summary) and Table 4 of Appendix IX (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the BHHRA.

RISK CHARACTERIZATION

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison between expected contaminant intakes at the Site and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) that are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media at the Site (e.g., the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

$$\text{HQ} = \text{Intake}/\text{RfD}$$

Where: HQ = hazard quotient
 Intake = estimated intake for a chemical (mg/kg-day)
 RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure

scenarios for a specific population. An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic hazards associated with these chemicals for each exposure pathway is contained in Table 5 of Appendix IX.

It can be seen in Table 5 that the HI for noncancer effects is elevated for future residents exposed to groundwater because of concentrations of TCE, PCE, and vinyl chloride. TCE and PCE were also identified as COCs in soil because of elevated soil gas concentrations.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

$$\text{Risk} = \text{LADD} \times \text{SF}$$

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
 LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
 SF = cancer slope factor, expressed as $[1/(\text{mg/kg-day})]$

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4} .

A summary of the estimated cancer risks are presented in Table 6 of Appendix IX. Risks and hazards were evaluated for the potential future exposure to groundwater. The populations of interest included adult site workers, residential adults, and children at each of five properties of interest. The cancer risks exceeded EPA's acceptable ranges at two properties. The noncancer hazards at each of the properties were above the EPA acceptable value of 1. The COCs identified in the groundwater were TCE, PCE, and vinyl chloride. The groundwater remedy will be addressed in a separate operable unit and decision document. TCE and PCE were also identified as COCs in soil because of elevated soil gas concentrations.

UNCERTAINTIES

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental data
- environmental parameter estimation
- toxicity values
- risk characterization

Two of the primary sources of uncertainty identified in the HHRA were associated with exposure parameters and toxicological data. Uncertainty in exposure parameters was related to many of the parameters being associated with default values because site-specific values were not available. This would provide a conservative estimate of potential risk and hazards.

Another important source of uncertainty was toxicological data. The toxicity factors used in the quantitative evaluation of potential risks and hazards were primarily selected from IRIS. For many chemicals, there is a lack of appropriate information on effects in humans (i.e., epidemiologic studies). Therefore, animal studies are generally used to develop toxicity values in human health risk assessments, which may under- or over-estimate potential risks and hazards.

More specific information concerning uncertainty in the health risks is presented in the baseline human health risk assessment report.

ECOLOGICAL RISK ASSESSMENT

A screening-level ecological risk assessment was conducted to evaluate the potential for ecological risks from the presence of contaminants in surface soil. The SLERA focused on evaluating the potential for impacts to sensitive ecological receptors to Site-related constituents of concern through exposure to surface soil on the properties and to surface water, sediment, and pore water from Rio Guanajibo. Surface soil, surface water, sediment, and pore water concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. A complete summary of all exposure scenarios can be found in the SLERA.

SURFACE SOIL

There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to surface soil at the five PSA properties. The surface soil screening criteria were exceeded for metals (chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc), which resulted in HIs greater than the acceptable threshold value of 1. However, none of the metals were considered to be Site-related; therefore there were no COCs selected for surface soil at any of the properties.

SURFACE WATER

There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to surface water in the Rio Guanajibo. The surface water screening criteria were exceeded for metals (aluminum, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, silver, vanadium, and zinc) and three volatile organic compounds (chloroform, toluene, and TCE), which resulted in HIs greater than the acceptable

threshold value of 1. The metals were not considered to be Site-related and were not selected as COCs. The elevated concentration of TCE in surface water was located near a drainage area adjacent to Retiro Industrial Park, in an area with limited viable habitat. Therefore, no adverse effects on survival, growth, and/or reproduction of aquatic organisms is expected to occur, and no COCs were identified for surface water.

SEDIMENT

There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to sediment in the Rio Guanajibo. The surface soil screening criteria were exceeded for metals (antimony, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, nickel, silver, and zinc), which resulted in HIs greater than the acceptable threshold value of 1. However, none of the metals were considered to be Site-related, therefore there were no COCs selected for sediment from the Rio Guanajibo.

PORE WATER

There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to pore water in the Rio Guanajibo. The surface soil screening criteria were exceeded for metals (aluminum, barium, chromium, cobalt, copper, iron, lead, manganese, nickel, and vanadium), which resulted in HIs greater than the acceptable threshold value of 1. However, none of the metals were considered to be Site-related, therefore there were no COCs selected for pore water from the Rio Guanajibo.

Based on the results of the ecological risk assessment, no remedial action is necessary to protect the environment from actual or threatened releases of hazardous substances.

RISK ASSESSMENT SUMMARY

In summary, volatile organic compounds, specifically TCE, PCE, and vinyl chloride in groundwater at the Site contributed to unacceptable risks and hazards to future residents. TCE and PCE were also identified as COCs in soil because of elevated soil gas concentrations. Based on the results of the human health assessments, the response action selected for OU-1 in this ROD is necessary to protect the public health or welfare of the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels. The Site-related contaminants are chlorinated ethenes and their degradation products, including PCE, TCE, *cis*-1,2-DCE, vinyl chloride, and 1,1-DCE. The contaminated media addressed in this remedy are soils that act as a source of groundwater contamination, soil vapors, and a portion of the groundwater that is in direct contact with these

contaminants in the saprolite zone.

EPA has established expectations to use treatment to address any principal threats posed by a site. Principal threat wastes are those source materials considered to be highly toxic or mobile that generally cannot be reliably contained or would otherwise present a significant risk to human health or the environment should exposure occur. At both Wallace and CCL lots, PCE and TCE concentrations were detected in groundwater samples collected from both properties, indicating contaminants have migrated from the unsaturated soil to the saturated soil and groundwater. Considering the high concentrations present in the saturated soil that underlies the source areas, data indicate that a large contaminant mass is present in the saturated soil. Therefore, PCE and TCE contamination in the vadose zone fits the definition of principal threat waste and would require remediation through treatment, where practicable.

The sources of soil contamination at the Retiro Industrial Park have been determine to be the Wallace and CCL lots. Soil on these two properties, including the shallow saprolite zone of saturated soils below the footprint of the vadose zone contamination, where the contaminants originally contacted groundwater, potentially contain residual DNAPL and likely contain the highest contaminant mass in the subsurface, which can serve as continuing sources for groundwater contamination.

Soil vapor samples show elevated soil vapor under the building slabs at both the Wallace and CCL facilities, which are currently occupied commercial buildings, and as such there is a threat of exposure to contaminants such as PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. These contaminants may pose risks to human health through inhalation, ingestion, and dermal contact. Vapor accumulation beneath the building slabs at these source areas and over the groundwater plume has been observed.

To protect human health and the environment, the following RAOs have been identified.

The RAOs for soil are:

- Prevent/minimize contaminated vadose-zone soil from serving as a source of groundwater contamination.
- Reduce contaminant mass in the saturated shallow saprolite zone soil that is serving as a source for groundwater contamination.

The RAO for soil vapor is:

- Reduce contaminant mass serving as a source for current and potential vapor intrusion.
- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion.

The soil contaminant source areas to be addressed by this response action are located above and below the water table, and they appear to extend as deep as the shallow saprolite zone.

REMEDIATION GOALS

To meet the RAOs, remediation goals were developed to aid in defining the extent of contaminated soil requiring remedial action. Remediation goals are typically chemical-specific measures for each media and/or exposure route that, if attained, are expected to be protective of human health and the environment. In this case, soil remediation goals were developed to address soils as a source of groundwater and soil vapors contamination, to satisfy the RAOs. They are derived based on comparison to ARARs, risk-based levels, and background concentrations, with consideration also given to other requirements such as analytical detection limits, guidance values, and other pertinent information.

There are no promulgated federal or Commonwealth of Puerto Rico chemical-specific ARARs for soil. To meet the RAOs for the soil as well as to address soil vapors, Site-specific soil remediation goals were developed using two parameters: the Site-specific soil-water partitioning coefficient, K_d ; and a Dilution Attenuation Factor (DAF). The soil remediation goals were calculated using a Site-specific soil-partitioning coefficient and the standard DAF of 20. The DAF considers dilution and attenuation factors that reduce contaminant concentrations in soil leachate during migration through the vadose zone. Table 1, contains the remediation goals for soil based on impact to groundwater.

Contaminants of Concern	Soil Protective of Groundwater	Remediation Goals	Maximum Detected Concentrations
<i>cis</i> -1,2-dichloroethene	204	204	4,400
Tetrachloroethene	101	101	46,000
Trichloroethene	36	36	3,600
Vinyl chloride	2	2	520J
1,1-Dichloroethene	35	35	84

EPA anticipates that any remedy selected in this ROD will comprehensively address contaminated vadose-zone soil as a source of groundwater contamination and achieve the remediation goals, which are “soil” remediation goals. Below the water table, EPA expects the remedy will reduce contaminant mass in the shallow saprolite zone. However, EPA recognizes that the shallow saprolite zone includes a mixture of contaminated soil and groundwater, and, therefore, the effectiveness of the treatment technologies considered, which were primarily developed to address the soils, may be limited with respect to the groundwater.

EPA expects the implementation of this action, OU-1, to overlap with the selection and implementation of a complementary remedy to address the groundwater in OU-2. By extending the scope of the OU-1 remedial technologies to the full depth of the shallow saprolite zone below the vadose-zone source areas, EPA expects to expedite the overall remediation of the contaminant sources to groundwater. EPA expects that a final remedy for the Site, to be selected in OU-2, will reconsider the soil/groundwater in the shallow saprolite zone addressed in this OU-1 remedy,

possibly augmenting or amending this OU-1 action based on new information or upon the results the OU-2 RI/FS.

DESCRIPTION OF THE ALTERNATIVES

Remedial alternatives were assembled by combining the retained remedial technologies and process options for the contaminated media in OU-1. The areas considered for remediation at OU-1 include the following:

- The soil contamination in the vadose zone that exceeds the remediation goals.
- The contaminated, saturated soil in the shallow saprolite zone below the footprint of the vadose zone contamination (as described below).

The areas where the contamination, as described above, are located are collectively referred to as the source zone. The highest contaminant mass in the source zone appears to be present in the subsurface, and it serves as a continuing source to groundwater contamination.

Five source areas (SAs), as shown in Figure 13, were identified based on a review of the RI sampling results and the past practices for storage and usage of chemicals at the Wallace and CCL facilities. Specific information for each source area is described below. High sub-slab soil vapor concentrations were detected at both facilities, and the extent of soil contamination underneath the buildings could be different from and larger than what is shown in Figure 13.

- Source Area 1 (SA-1) is located at the Wallace lot. This is the approximate area where drums were historically stored. High PCE and TCE concentrations were found in the sub-slab vapor samples in the vicinity of this area. Therefore, additional soil delineation underneath the building in this area is warranted to define the extent of contamination further.
- Source Area 2 (SA-2) is located at the Wallace lot. Soil contamination was found in this area outside the buildings as seen in Figure 11. Additional soil delineation underneath the building is warranted in this area to define the extent of the contamination further.
- Source Area 3 (SA-3) is located at the Wallace lot. This area encompasses soil where the highest PCE concentrations were detected outside a building under a paved area. The highest PCE concentrations in this area were detected in samples from the ground surface to 2 feet bgs and from 5 to 7 feet bgs in boring WS-8. The PCE concentrations decreased with depth, indicating the majority of the contaminant mass is held in the shallow unsaturated clay and silt, likely because of the presence of pavement and limited infiltration. Additional soil delineation underneath the building or along the subsurface drainage channel is warranted to define the extent of contamination further. Because of the relatively moderate groundwater contaminant concentrations at this location (WS-8 with PCE at 233 µg/L) and the fact that soil concentrations decreased with depth, the saprolite zone is not included in the source zone at this area.

- Source Area 4 (SA-4) is located at the CCL lot. Elevated TCE and *cis*-1,2-DCE soil contamination was found between 5 and 7 feet bgs. The extent of soil contamination in this area appears to be localized. Additional soil delineation is recommended to define the treatment zone.
- Source Area 5 (SA-5) is located at the CCL lot. Elevated TCE concentrations were found in the soil between 10 and 22 feet bgs. In the saturated zone, TCE was found at 27,700 µg/L from 19.5 to 23.5 feet bgs. It was also found at 65,400 µg/L from 26.5 to 30.5 feet bgs. The data indicate the possibility of residual DNAPL in the shallow saprolite zone. Additional soil and groundwater samples should be collected during the pre-design investigation (PDI) to define the treatment zone.

Common Elements

There are several common elements that are included in all the remedial alternatives. With the exception of five-year reviews, the common elements listed below do not apply to the no action alternative.

Pre-Design Work

A PDI should be conducted as part of the remedial design. The extent of soil contamination underneath the buildings would be delineated during the PDI. These activities could impact the business operations at the respective facilities, and therefore efforts will be made to minimize interruption of operations.

Institutional Controls

While the RAO for OU-1 includes addressing contaminated soils within the source areas within the Retiro Industrial Park as an initial action for the Site, contaminated groundwater (including the areas to be addressed in OU-2) poses the primary human health concern at the Site. As part of the OU-1 remedy, EPA intends to consider available institutional controls (ICs) and engineering controls that would be effective in restricting contact with contaminated groundwater. By placing ICs to restrict use of the groundwater at this time, EPA can minimize the potential for human exposure while a final remedy for the Site is considered, selected, and implemented, as necessary. ICs and engineering controls (e.g., warning signs, advisories, legally enforceable drilling restrictions, and public education) may also be employed to limit exposures to groundwater contamination.

Vapor Mitigation Systems

EPA's Removal Program is addressing vapor exposure issues separately; therefore, appropriate technologies for mitigating exposures because of vapor intrusion, such as subslab mitigation systems, are not being evaluated as part of OU-1. Systems may be installed at the facility buildings located at the Wallace and CCL lots to prevent vapor intrusion, and if so they would be expected to remain in place until the underlying soil and groundwater sources are addressed at the Site. If installed, the maintenance of these systems would be incorporated into the larger operation and maintenance (O&M) requirements for the Site remedy. Even after the remediation of vadose zone

soil, potential soil vapor may continue to accumulate underneath the building slabs and require the operation of mitigation systems in order to mitigate the risk of soil vapor intrusion into the buildings until the conditions at the Site no longer necessitate their operation.

Long-term Monitoring

Periodic monitoring of Site groundwater would be implemented when contaminants remain above levels that allow for unrestricted use and unlimited exposure. The monitoring program would continue until concentrations have met remediation goals. Because the OU-1 and OU-2 remedies are anticipated to be closely aligned, the scope and extent of long-term monitoring is not considered in OU-1 but will be addressed in OU-2.

Five-Year Reviews

While not part of the remedial action, remedies resulting in contaminants remaining above levels that allow for unrestricted use and unlimited exposure require that a site be reviewed at least once every five years after the initiation of the remedy. If justified by the review, additional remedial actions may be considered to remove, treat, or contain the contamination. For remedial actions where unrestricted use and unlimited exposure is expected by the remedial action, but it may require many years to reach that objective, it is EPA policy to conduct five-year reviews until those RAOs are achieved and the use is unrestricted.

For OU-1, a remedial action objective for the vadose zone soils is unrestricted use and unlimited exposure. Because it may require more than five years to reach that objective, EPA expects to conduct five-year reviews for OU-1 until RAOs are achieved within the vadose zone soils. The OU-1 remedy addresses the most highly contaminated portion of the groundwater plume, and the OU-2 remedy will address the remainder of the groundwater plume. Therefore, the need for a five-year reviews for groundwater will be assessed during OU-2.

EPA Region 2 Clean and Green Policy

The environmental benefits of any selected remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2 Clean and Green Energy Policy. This will include consideration of green remediation technologies and practices. Some examples of practices that would be applicable are those that reduce emissions of air pollutants, minimize fresh water consumption, incorporate native vegetation into re-vegetation plans, and consider beneficial reuse and/or recycling of materials, among others.

Remedial Alternatives

Alternative S1 – No Action

The Superfund program requires that the “no-action” alternative be considered for comparison with the other alternatives. This serves as a baseline for comparison to active remedial alternatives. Alternative S1 costs and time frames are presented in Table 2.

Table 2
Alternative S1 Cost Summary

Capital Cost	\$0
Present Worth O&M Cost	\$0
Total Present Worth Cost	\$0
Timeframe to meet RAOs	Will not meet RAOs

Alternative S2 – Excavation and Off-site Disposal/*In-Situ* Treatments

Because the level and distribution of contamination at each source area at the Wallace and CCL lots is different, not every component of this remedial alternative is anticipated to be applied at each source area. For cost-estimating purposes, the conceptual approach for each area is listed below:

- SA-1: Excavation and off-site disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment in the remainder of the vadose zone from 13 feet bgs to 20 feet bgs. It is estimated that approximately 505 cubic yards will be excavated in this area. This area is underneath the Wallace facility building with limited infiltration. For cost estimating purposes, it is assumed that the treatment zone is from ground surface to 20 feet bgs.
- SA-2: Excavation and off-site disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment for the remainder of the vadose zone and the shallow saprolite zone. It is estimated that approximately 3,827 cubic yards will be excavated in this area. This area is located at the Wallace lot.
- SA-3: Excavation and off-site disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment for the remainder of the vadose zone to 20 feet bgs. It is estimated that approximately 2,238 cubic yards will be excavated in this area. This area is underneath the Wallace facility building and pavement with limited infiltration, contaminant concentrations are decreasing over depth, and the grab groundwater sample from WS-8 revealed PCE and TCE at 233 µg/L and 38.7 µg/L, respectively; therefore, the majority of contaminants are believed to be held in the vadose zone soil. For cost-estimating purposes, the treatment zone is assumed to be from ground surface to 20 feet bgs.
- SA-4: *In-situ* treatment in the vadose zone soil and shallow saprolite zone from 5 feet bgs to 40 feet bgs. The contaminant level was low in the shallow vadose zone; it is not cost effective to perform excavation at this area. This area is located on the CCL lot.
- SA-5: *In-situ* treatment in the vadose zone soil and the shallow saprolite zone from 5 feet bgs to 40 feet bgs. Soil contaminant concentration were moderate, and vertical distribution of contaminant concentration indicates the majority of contaminants have migrated to the shallow saprolite zone. It is not cost effective to perform excavation at this area. This area is located on the CCL lot.

For costing purposes, excavation would be performed to 13 feet bgs at SA-1, SA-2, and SA-3

areas. The exact dimensions of the area to be excavated and volume of soil to be excavated would be determined during the remedial design. The major portions of these three areas are located underneath the buildings or pavement. The concrete slab and pavement covering these areas would need to be demolished before conducting the excavation. The excavated area would be backfilled with imported clean common fill and properly compacted. The cost estimate also takes into account the reconstruction of the slab following excavation and backfilling activities.

Soil samples would also be collected from the bottom of the excavation for documentation purposes. The effectiveness of excavation would be confirmed with the post-excavation sample results from sidewalls. Two rounds of soil sampling would also be performed, each after one round of *in-situ* treatment, in the vadose zone to evaluate the effectiveness of *in-situ* treatment. Results from the first round of soil sampling would be used to design the second round of *in-situ* treatment to areas with contaminant concentrations exceeding the PRGs in the vadose zone soil.

Excavated soils would be disposed of off Site in a Resource Conservation and Recovery Act (RCRA) Subtitle D (non-hazardous) landfill. If the excavated soil is found to be hazardous as determined by toxicity characteristic leaching procedure analysis, it would be shipped to the mainland for proper treatment and disposal. The excavated area would be backfilled with imported clean common fill and properly compacted.

While methods of *in-situ* treatment discussed above are not fixed, the expected *in-situ* treatment methodology assumed in the FS was the addition of organic amendments into the subsurface to promote anaerobic biodegradation of the chlorinated VOCs. Following the excavation at SA-1 and SA-3, perforated horizontal pipes could be placed at the bottom of the excavation prior to backfill. At each area, these pipes would be combined at a header with a vertical pipe extending to ground surface and connected to a storage tank. Organic amendment solution could be added to this storage tank periodically and gravity fed into the treatment zones to promote *in-situ* anaerobic biological treatment.

At SA-2, contamination is known to have migrated into the shallow, saturated saprolite zone. Source treatment at the deep vadose zone and the shallow saprolite zone would be conducted simultaneously. Following excavation and backfill, organic amendments would be injected into boreholes from a depth of 13 feet bgs to 40 feet bgs, spaced 10 feet apart to promote anaerobic biological treatment.

The vadose zone soil contamination at SA-4 and SA-5 would be remediated together with the saturated soil using *in-situ* treatment technologies. Similar to what was described for SA-2, amendment would be distributed into the vadose zone soil and the shallow saprolite zone injection spaced 10 feet apart. Amendment distribution for the deeper treatment zone in the shallow saprolite zone would be performed with injection wells.

Monitoring wells would be installed up-gradient and downgradient of the treatment zone for the evaluation of treatment effectiveness in the shallow saprolite. MW-2S and MW-3S would be used

for performance monitoring if these two wells are confirmed to be outside the treatment zone after the PDI. For cost-estimating purposes, a total of 10 monitoring wells would be installed. Groundwater and soil samples would be collected prior to treatment and post treatment to evaluate the effectiveness of *in-situ* treatment.

After the completion of this OU-1 remedial alternative, all equipment and materials would be removed from the Site. The Site would be restored to prior conditions to the extent possible. The injection and monitoring wells would be retained for use during OU-2, as appropriate. Costs associated with alternative S2 are presented in Table 3.

Table 3
Alternative S2 Cost Summary

Capital Cost	\$12,883,000
Present Worth O&M Cost	\$ 549,000
Total Present Worth Cost	\$ 13,432,000
Construction Time Frame	12 to 18 months
Timeframe to meet RAOs	2.5 years

Alternative S3 – Soil Vapor Extraction and Dual-Phase Extraction)/In-Situ Treatments

Under this alternative, a pilot study would be performed as part of the PDI to collect the design parameters for the Soil Vapor Extraction (SVE) and dual-phase extraction (DPE) system. For the design of an SVE system, an air permeability test would be conducted to determine the Site-specific design parameters, such the achievable air flow rate, the required vacuum to induce the flow, the radius of influence from the applied vacuum, and the initial contaminant removal rates. For the DPE, the achievable sustained groundwater extraction rate and the drawdown would be studied.

This remedial alternative would consist of the following major components:

- Cap Installation at SA-2 and SA-3;
- SVE system installation and operation;
- Dual phase extraction system installation and operation;
- *In-situ* treatment (e.g., enhanced anaerobic biodegradation);
- Treatment performance evaluation; and
- Site restoration.

Because the level and distribution of contamination at each source area is different, not every component is anticipated to be applied at each source area. For cost-estimating purposes, the conceptual approach for each area is listed below.

- SA-1: SVE in the vadose zone.
- SA-2: SVE in the vadose zone in conjunction with DPE in the shallow saprolite zone, followed by *in-situ* treatment as described in Alternative S2.

- SA-3: SVE in the vadose zone.
- SA-4: *In-situ* treatments for both the vadose zone and the shallow saprolite as described in Alternative S2.
- SA-5: DPE in the shallow saprolite, followed by *in-situ* treatment in both the vadose zone and the shallow saprolite as described in Alternative S2.

Two existing buildings and paved driveways at the Wallace lot would act as caps for the SVE system to prevent short-circuiting from the atmosphere. Additional impermeable cover could be installed as necessary for the implementation of SVE. Any additional cover would be engineered to limit infiltration of rain water into the contaminated soils, meaning that durable, low-permeability material would be used, and rainwater would be directed away from the remediation zone. (For cost-estimating purposes, it is assumed no additional cap is needed.)

In source areas SA-1, SA-2, and SA-3, vertical SVE wells would be installed in the vadose zone to target the entire vadose zone contamination without extracting groundwater. For cost-estimating purposes, it is assumed 3, 13, and 8 SVE wells would be installed in SA-1, SA-2, and SA-3, respectively. Nested vapor monitoring wells also would be installed to monitor the progress of contaminant removal and the changes in soil vapor pressure.

Piping for transferring the extracted soil vapor to an above-ground treatment system would be routed underground, along the wall or overhead, to minimize impact to routine building operations. An above-ground treatment system would be installed in a pre-fabricated building brought on-site to treat the extracted soil vapor prior to discharge to the atmosphere.

For cost-estimating purposes, it is assumed that the SVE system would be operated continuously for the first two years and intermittently for the following eight years.

The DPE system would be installed at SA-2 and SA-5 to reduce the contaminant mass in the shallow saprolite zone prior to implementing other *in-situ* treatment methods. DPE wells would be installed based on the conclusions of the remedial design. For cost-estimating purposes, it is assumed 13 and 4 DPE wells will be installed in SA-2 and SA-5, respectively.

The extracted vapor would be treated using the same vapor treatment system described above for SVE, if possible. The water treatment system also would be installed in the same building that would house the vapor treatment system. This system is anticipated to consist of groundwater extraction pumps, piping, transfer pumps, bag filters, and an air stripper in addition to the air-water separator and vapor phase activated carbon. Treated water would be discharged to the nearby open drainage ditch and meet Puerto Rico discharge permit requirements. For cost-estimating purposes, the DPE system is anticipated to be operated for one year.

Following the DPE treatment, the remaining contamination in SA-2 and SA-5 would be remediated with an *in-situ* treatment technology similar to those described in Alternative S2. The vertical intervals for the *in-situ* treatment might be adjusted in accordance with the operation of the SVE system. *In-situ* remediation at SA-4 would be performed as described in Alternative S2.

After the completion of the remedy, equipment and materials would be removed from the Site, and the Site would be restored. The wells would be properly abandoned if necessary. DPE wells and monitoring wells screened in the shallow saprolite zone would be kept as necessary for OU-2. Costs associated with alternative S3 are presented in Table 4.

Table 4
Alternative S3 Cost Summary

Capital Cost	\$ 5,448,000
Present Worth O&M Cost	\$ 1,880,000
Total Present Worth Cost	\$ 7,328,000
Construction Time Frame	8 months
Timeframe to meet RAOs	At least 10 years

Alternative S4 – *In-situ* Thermal Remediation and SVE/*In-Situ* Treatments

This remedial alternative would consist of the following major components:

- Cap Installation at SA-2, SA-3, and SA-5 (as necessary);
- SVE and *in-situ* thermal remediation (ISTR) system installation and operation;
- Decommissioning of ISTR;
- Treatment performance evaluation;
- *In-situ* treatment as necessary; and
- Site restoration.

Because the level and distribution of contamination at each source area is different, not every component is anticipated to be applied at each source area. For cost estimating purposes, the conceptual approach for each area is listed below.

- SA-1: ISTR and SVE in the vadose zone.
- SA-2: ISTR and SVE for both the vadose zone and the shallow saprolite, followed by *in-situ* treatments.
- SA-3: ISTR and SVE in the vadose zone.
- SA-4: *In-situ* treatment for both the vadose zone and the shallow saprolite zone.
- SA-5: ISTR and SVE for both the vadose zone and the shallow saprolite zone, followed by *in-situ* treatment.

Impermeable surface cover would be installed at SA-2, SA-3, and SA-5, as necessary. The majority of SA-2 and SA-3 areas are already under Wallace facility buildings or pavement. The building slab and pavement would be inspected and repaired as necessary. SA-5 is partially

covered by parking lot. The parking lot would be inspected and repaired as necessary, and areas to be remediated with SVE and ISTR would be paved as necessary.

Combined soil vapor extraction and heating wells would be installed at the property currently occupied by Wallace (SA-1, SA-2, and SA-3) and CCL (SA-5). Electrical resistance heating (ERH) and thermal conductive heating (TCH) are the most common methods for thermal remediation of chlorinated solvent contamination. Both ERH and TCH are anticipated to be effective at the Site. For costing purposes, it is assumed ERH will be used.

As a result of space constraints at the Wallace lot, it likely would be difficult to install combined heating and vapor extraction wells in the configuration that vendors have identified as most optimal (12-inch boreholes with an 8-foot radius of influence). For cost-estimating purposes, it is assumed that 12-inch borings would be installed in outdoor areas, in both a vertical configuration and also angled under the building, and 4-inch borings would be installed indoors. Because of the lower surface area of the small-boring electrodes, the radius of influence would be less than the 12-inch boring electrodes.

At the CCL lot, SA-5 is outside and has severe space constraints. Thus, it is assumed only 12 borings would be installed at the property. At all the ISTR areas, temperature monitoring points would be installed to monitor the progress of heating in the soil along with additional dedicated soil vapor extraction wells. The existing pavement at the Site would be retained because it serves to inhibit both heat and vapor loss from the subsurface.

Heating of the soils is anticipated to take approximately 100 days, during which the SVE system would be operated to remove volatilized contaminants. Additional sampling and analysis would also be conducted in order to meet the air emission permit requirements. After heating, an approximately 100-day soil cool-down period would be needed prior to removal of the system and abandonment of the wells in SA-1 and SA-3. The SVE system would be operated during the cool-down period and possibly longer if warranted.

Toward the end of the heating period, soil samples would be collected within the treatment zones for VOC analysis to evaluate the effectiveness of the thermal treatment. For costing purposes, it is assumed that once 90 percent of the source zone mass has been removed (a typical efficiency for *in-situ* thermal remediation), then heating would be complete. *In-situ* treatment would start in SA-2 and SA-5. In SA-1 and SA-3, it is assumed for costing purposes that the SVE system would continue to target residual mass, and a cap would be maintained over the treatment area to prevent short-circuiting and surface water infiltration.

In-situ treatments would be applied in SA-4 as described in Alternative S2. At SA-1, SA-2, SA-3, and SA-5, with extended operation of the SVE system, the vadose zone soil is expected to meet the remediation goals. Therefore, no additional *in-situ* treatment is anticipated to be needed at SA-1 and SA-3. For SA-2 and SA-5, one round of *in-situ* treatment would be conducted in the shallow saprolite zone and possibly the capillary fringe using a combination of direct push technology and injection wells for amendment placement, as described in Alternative S2.

For SA-2 and SA-5, the *in-situ* treatment described above would commence soon after the ISTR

phase, since the residual heat would be conducive to the growth of microbes. The effectiveness of ISTR in the vadose zone soil would be evaluated by collecting soil samples. The effectiveness of ISTR and *in-situ* treatment would be evaluated by collecting groundwater samples from monitoring wells as described in Alternative S2.

After the completion of the OU-1 remedial action, the heating wells, the soil vapor extraction wells, and soil vapor monitoring points would be properly abandoned. All the equipment and materials would be removed or demobilized. Wells that could be used for OU-2 would be kept. The Site would be restored. Costs associated with alternative S4 are presented in Table 5.

Table 5
Alternative S4 Cost Summary

Capital Cost	\$ 12,741,000
Present Worth O&M Cost	\$ 549,000
Total Present Worth Cost	\$ 13,290,000
Construction Time Frame	1-2 years
Timeframe to meet RAOs	2.5 years

EVALUATION OF REMEDIAL ALTERNATIVES

In selecting a remedy, EPA considers the factors set out in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial alternatives in accordance with the NCP, NCP Section 300.430(e)(9)(iii) and the EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01. The detailed analysis consists of an assessment of each alternative against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following “threshold” criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. The NCP recognizes that TBC may be used to determine what is protective of a site or how to carry out certain actions or requirements.

The following “primary balancing” criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain

reliable protection of human health and the environment over time, once cleanup levels have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup levels are achieved.
6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
7. *Cost* includes estimated capital, O&M, and present worth costs.

The following “modifying” criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. *State acceptance* indicates whether, based on its review of the RI/FS report, Human Health and Ecological Risk Assessment, and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.
9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS Reports, the Human Health and Ecological Risk Assessments, and the Proposed Plan.

A comparative analysis of the alternatives considered in this ROD, based upon the evaluation criteria noted above, follows.

COMPARATIVE ANALYSIS OF ALTERNATIVES

Overall Protection of Human Health and the Environment

Alternative S1, No Action, would not meet the RAOs and would not be protective of the environment since no action would be taken. The contaminated soil would continue to be a source of groundwater and soil vapor contamination.

Alternatives S2, S3 and S4 would meet the RAOs and would be protective of human health and the environment by addressing the source areas, to the extent practicable. Treatment and excavation technologies may not be able to treat all the contamination underneath occupied buildings. If that is the case, the buildings could act as a cap to minimize infiltration of surface water and reduce contaminant migration into groundwater.

Compliance with ARARs

There are no federal or Commonwealth of Puerto Rico chemical-specific ARARs for soils. While not ARARs, the Site-specific remediation goals would be met in soils above the water table with Alternatives S2, S3, and S4, and the technologies in Alternatives S2, S3, and S4 would effectively remove contaminant mass below the water table.

Excavation and off-site disposal under Alternative S2 would need to satisfy the land disposal requirements under RCRA. All active alternatives (S2, S3, and S4) would comply with action-specific ARARs. Action-specific ARARs would not be attained under the no action alternative because no work would be implemented.

Long-Term Effectiveness and Permanence

Under the no action alternative, contamination would continue to be present in the vadose zone and migrate in the soil and continue to impact groundwater in the future. The no action alternative is not effective nor permanent.

For Alternatives S2 and S4, with either excavation (S2) or thermal remediation (S4) combined with *in-situ* treatment, a significant degree of permanent mass removal is expected, with a resulting high degree of long-term effectiveness and permanence. For Alternative S3 with DPE/SVE, technical limitations may mean that not all the contamination would be removed from the clayey soil. The radius of influence of SVE wells would be low in clayey soil. Significant diffusion of contamination into the clay is likely to have occurred. The SVE system may need to be operated for a much longer period than the time estimated for the remedial alternatives set forth in Alternatives S2 and S4 to achieve a similar level of permanent mass removal. However, the technologies employed in Alternative S3 have the best potential to treat contamination beneath building slabs, whereas the primary technologies associated with Alternatives S2 and S4 have limited effectiveness under the occupied structures.

For any contamination underneath the buildings on the Wallace and CCL lots that are not accessible for excavation or thermal treatment, the buildings would act as a cap to prevent contaminant migration into groundwater.

Reduction of Toxicity, Mobility, and Volume Through Treatment

The no action alternative would not reduce contaminant toxicity, mobility, and volume (T/M/V) because no remedial action would be conducted.

The excavation and thermal remediation alternatives would be expected to reduce T/M/V significantly through treatment. DPE/SVE under Alternative S3 likely would reduce T/M/V through treatment to a degree, but its effectiveness in the tight soils at the Site likely would be limited, and thus, reduction of T/M/V may be limited. The extent and effectiveness of T/M/V reduction by DPE/SVE would need to be verified with monitoring. *In-situ* treatment would enhance T/M/V and is included in Alternatives S2, S3, and S4.

Short-Term Effectiveness

With respect to the no action alternative, there would be no short-term impact to the community and environment as no remedial action would occur.

There would be significant short-term impacts to the ongoing businesses on-site, the local community, and workers for the remaining alternatives because of the active remedial actions undertaken and associated construction and operation.

Operation at currently occupied facilities (e.g., at the Wallace facility) would need to be modified or temporarily shut down for Alternatives S2 and S4. Excavation would involve truck traffic and noise from heavy equipment operations. Thermal remediation under Alternative S4 would require the presence of substantial piping and treatment elements at the Site for a period on the order of one year, causing substantial short-term disruption to property use. Similarly, excavation activities under Alternative S2 would cause substantial short-term disruptions and may require temporary business closures for occupied properties in the Industrial Park. By contrast, SVE and other *in-situ* treatment infrastructure (the latter is part of all the active alternatives, and the former is part of the work to be performed for Alternative S3) would require substantially less short-term disruptions during installation, and while the systems may be present for a number of years, they would not pose any significant adverse impact property use once installed.

Alternative S3 (DPE/SVE) would have a smaller footprint in terms of short-term effectiveness as opposed to the other two active remediation options. Air monitoring, engineering controls, and appropriate worker personal protective equipment would be used to protect the community and workers during the implementation of these alternatives.

Alternatives S2 and S4 would achieve the RAOs in approximately 2.5 years while Alternative S3 is expected to achieve the RAOs in approximately 10 years.

Implementability

The no action alternative would be easiest both technically and administratively to implement as no additional work would be performed at the Site. Both Alternative S2 (with thermal remediation) and Alternative S4 (with excavation) face considerable implementation hurdles. Because excavation would be occurring directly inside and adjacent to buildings, shoring and underpinning would be necessary to support the structures during the work. Any excavated hazardous waste would have to be shipped to the continental United States for disposal because there are no permitted hazardous waste landfills on Puerto Rico.

For thermal remediation, the presence of buildings (with tenants) in the treatment zones also presents challenges regarding implementation, such as installing heating elements inside an active facility. During remedial design, it may be possible to install heating elements either at angles or horizontally into the treatment zone from outside the buildings.

For Alternative S3, the major implementability limitation would be the ability to access the treatment zone based on physical limitations. The limited effectiveness of SVE/DPE in clayey

soils is also an implementability concern, but it is expected that it can be overcome by extending the period of performance out to an estimated 10 years, at which time a comparable level of mass removal can be expected, when compared to the other active alternatives.

Cost

Alternative S1 would not include any cost. Alternative S3 has substantially lower cost than Alternative S2 and S4. The cost estimates for all four alternatives are provided in Table 6.

Table 6
Alternatives Costs

Soil Source Alternative	Capital Cost	Present Worth O&M Cost	Total Present Worth Cost
S1	\$ 0	\$0	\$0
S2	\$12,883,000	\$ 549,000	\$13,432,000
S3	\$5,448,000	\$1,880,000	\$7,328,000
S4	\$12,741,000	\$549,000	\$13,290,000

State/Support Agency Acceptance

The Commonwealth of Puerto Rico concurs with the selected remedy. Copy of the concurrence letter is included in Appendix X.

Community Acceptance

All the alternatives were made available for the community to review and comment. The preferred alternative was presented to the community in the Proposed Plan. A public comment period (August 12, 2015, to October 24, 2015) was established to allow the community to review and comment on all the alternatives and the preferred alternative. In addition, a public meeting was held on August 19, 2015. EPA's response to public comments received during the comment period is presented in the Responsiveness Summary of this ROD, included as Attachment VII.

PRINCIPAL THREAT WASTES

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site whenever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. Source material includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present significant risk to human health or the environment should exposure occur. The principal threat concept is applied to the characterization of source materials at a Superfund site.

At both the Wallace and CCL lots, PCE and TCE concentrations have been detected in groundwater samples, indicating contaminants have migrated into the shallow saprolite zone and

the deeper fractured bedrock zone below. Soil source areas found in the vadose zone, and extending below the water table into the saturated soil in the shallow saprolite zone, contain large contaminant mass. Therefore, PCE and TCE contamination in these source areas fits the definition of principal threat waste and would require remediation through treatment, where practicable. The selected soil alternative for the vadose zone and the shallow saprolite within the Wallace and CCL lots rely on treatment to address the principal threats.

SELECTED REMEDY

SUMMARY OF THE RATIONALE FOR THE SELECTED REMEDY

Based upon the requirements of CERCLA, the results of the Site investigations, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative S3 satisfies the requirements of CERCLA Section 121, 42 U.S.C. § 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, set forth at 40 CFR §300.430(e)(9), as described below. The principal components of the selected remedy are described below:

Alternative S3 (Soil Vapor Extraction and Dual-Phase Extraction/*In-Situ* Treatment), is the selected alternative for OU-1. The remedy includes the following components:

- SVE to address soil (vadose zone) source areas at the Wallace and CCL lots;
- Impermeable cover as necessary for the implementation of SVE;
- DPE in the shallow saprolite zone; and
- *In-situ* treatment, such as enhanced anaerobic biodegradation, as needed to address residual sources.

DETAILED DESCRIPTION OF THE SELECTED REMEDY

Under this alternative, the soil source areas will be targeted with SVE in the vadose zone in combination with DPE in the shallow saprolite zone, followed by *in-situ* treatment as necessary. For this alternative, a pilot study will be performed as part of the PDI to collect the design parameters for the SVE and DPE system. For the design of a vapor extraction system, an air permeability test would be conducted to determine the Site-specific design parameters, such the achievable air flow rate, the required vacuum to induce the flow, the radius of influence from the applied vacuum, the initial contaminant removal rates.

The two buildings and the paved driveways at the Wallace lot are expected to act as caps for the SVE system to prevent short-circuiting from the atmosphere. Additional impermeable cover may be installed, as necessary, for the implementation of SVE. Any additional cover would be engineered to limit infiltration of rainwater into the contaminated soils, meaning that durable, low-permeability material would be used, and rainwater would be directed away from the remediation zone.

For cost-estimating purposes, it is assumed 3, 13, and 8 SVE wells will be installed in the areas

identified as SA-1, SA-2, and SA-3, respectively, at the Wallace lot. Nested vapor monitoring wells also will be installed to monitor the progress of contaminant removal and the changes in soil vapor pressure. Also, for cost-estimating purposes, it is assumed that the SVE system would be operated continuously for the first two years and then intermittently for the following eight years. The implementation of the SVE component of the remedy could be performed simultaneously with the operation of the DPE system, or alternatively the DPE system could be operated six months to one year after the start of the SVE system, depending on the level of initial contaminant concentrations and any other logistical considerations.

The DPE system would be installed at the areas identified as SA-2 and SA-5 to reduce the contaminant mass in the shallow saprolite zone prior to other *in-situ* treatment (that *in-situ* treatment is assumed to be the addition of organic amendments into the subsurface to promote anaerobic biodegradation). DPE wells would be installed based on the conclusions reached during the remedial design. For cost-estimating purposes, it is assumed 13 and 4 DPE wells will be installed in the areas identified as SA-2 and SA-5, respectively.

The water treatment system required for the DPE system would be installed in the same building that would house the vapor treatment system. This system is anticipated to consist of groundwater extraction pumps, piping, transfer pumps, bag filters, and an air stripper, in addition to the air-water separator and vapor phase activated carbon. Treated water would be discharged to the nearby open drainage ditch in accordance with an appropriate permit. Discharged water would meet Commonwealth of Puerto Rico discharge permit requirements. In addition, for cost-estimating purposes, the DPE system is anticipated to be operated for one year.

The remedy also calls for establishment of ICs and engineering controls to restrict contact with contaminated groundwater. By placing these controls on the groundwater at this time, EPA can minimize the potential for human exposure until the Site is available for unrestricted use. These controls (e.g., warning signs, advisories, legally enforceable drilling restrictions, and public education) would limit exposures to groundwater contamination.

EPA's Removal Program is addressing vapor exposure within the Wallace and CCL facility buildings separately. Consequently, appropriate technologies for mitigating exposures because of vapor intrusion, such as sub-slab mitigation systems, are not included in this remedy. Systems that may be installed at the buildings located at the Wallace and CCL lots to prevent vapor intrusion would be expected to remain in place until the underlying soil and groundwater sources of vapors are addressed. The maintenance of systems will be incorporated into the O&M requirements for the Site remedy.

Periodic monitoring of Site groundwater will be implemented for as long as contaminants remain above levels that allow for unrestricted use and unlimited exposure. The monitoring program would continue until concentrations have met remediation goals. Because the OU-1 and OU-2 remedies are expected to be closely aligned, the scope and extent of such long-term monitoring will be considered in OU-2.

RATIONALE FOR THE SELECTED REMEDY

EPA has determined that Alternative S3 provides the best balance of tradeoffs among the

alternatives considered based on the information available to EPA at this time. EPA and Puerto Rico Environmental Quality Board, on behalf of the Commonwealth, conclude that the selected remedy will treat principal threats, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy also would meet the statutory preference for the use of treatment as a principal element.

While the three active alternatives can achieve similar levels of protectiveness and Alternatives S2 and S4 appear capable of achieving the RAOs in a shorter time period (2.5 years as opposed to 10 years), the short-term occupant disruptions and implementability challenges are substantially greater than for Alternative S3. Alternative S3 also does not have the off-site disposal challenges of Alternative S2, and it is substantially less expensive.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy. This would include consideration of green remediation technologies and practices.

SUMMARY OF THE ESTIMATED SELECTED REMEDY COSTS

The estimated capital, O&M, and present worth costs of the components of the selected remedy is discussed in detail in the FS Report. The cost estimates, which are based on available information, are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project.

The capital, O&M, and present worth costs for the selected remedy are presented in Table 7.

EXPECTED OUTCOMES OF SELECTED REMEDY

The principal outcomes of the selected remedy are expected to be (1) to address soils and shallow groundwater as a source of groundwater contamination and subsurface vapors, in support of a comprehensive groundwater remedy to be evaluated in a subsequent OU-2, (2) to prevent or minimize exposure to contaminated groundwater, and (3) to allow for continued use of the Wallace an CCL facility buildings during implementation of the remedy.

STATUTORY DETERMINATIONS

CERCLA Section 121(b)(1) mandates that a remedial action must be protective to human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at the Site. CERCLA 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA 121(d)(4). For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of CERCLA Section 121.

Table 7
Costs for Alternative S3

Cost Estimate for Alternative S3
Soil Vapor Extraction and Dual Phase Extraction; and In Situ Treatment
San German Groundwater Contamination Site
San German, Puerto Rico

	Description	Cost
CAPITAL COSTS		
No. 1	General Conditions	\$1,496,000
No. 2	SVE and DPE System Construction and Startup	\$567,000
No. 3	In Situ Treatment	\$796,000
No. 4	First Year Soil Vapor Extraction Operation and Maintenance	\$412,000
No. 5	Year of Dual Phase Extraction Operation and Maintenance	\$331,000
	<i>Subtotal</i>	\$3,602,000
	Contingency 20%	\$721,000
	<i>Subtotal</i>	\$4,323,000
	General Contractor Bond and Insurance 5%	\$217,000
	<i>Subtotal</i>	\$4,540,000
	General Contractor Markup (profit) 10%	\$908,000
	Total Remedial Action Capital Costs	\$5,448,000
OPERATION AND MAINTENANCE COSTS		
No. 6	Annual O&M for SVE System Operating Full Year	\$324,000
	Present worth of O&M Second Year Costs	\$303,000
No. 7	Annual O&M for SVE System Operating Intermittently	\$172,000
	Present worth of O&M Years 3-10, Intermittent Operation	\$1,028,000
No. 8	Present worth of performance monitoring once per year for four years	\$549,000
PRESENT WORTH		
	Total Capital Cost	\$5,448,000
	Total O&M Cost	\$1,880,000
	Total Present Worth	\$7,328,000

Note: The project cost presented herein represents only feasibility study level, and is thus subject to change pending the results of the pre-design investigation, which is intended to collect sufficient data to assist in the development of remedial design and associated detailed cost estimate. Expected accuracy range of the cost estimate is -30% to +50%.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment because it will address Site's the source areas, to the extent practicable, over the long-term, address direct contact threats, and mitigate the potential for exposure through a vapor intrusion pathway until the VOC hot spots are remediated. Institutional and engineering controls will also assist in protecting human health and the environment over both the short and long-term by helping to control and limit exposure to hazardous substances.

Compliance with ARARs

There are no federal or Commonwealth chemical-specific ARARs for soils. EPA developed risk-based remediation goals and protection of groundwater values for soil at the Wallace and CCL lots. The selected remedy for soil at the Wallace and CCL lots will comply with chemical-specific and action-specific ARARs (Table 7 and 8 of Appendix IX).

The remedy will meet the RAOs and will be protective of the environment by addressing the source areas, to the extent practicable. This remedy is expected to comply with chemical, location, and action specific ARARs.

Cost Effectiveness

A cost-effective remedy is one which has costs that are proportional to its overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, and short-term effectiveness. EPA evaluated the “overall effectiveness” of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to those alternatives’ costs to determine cost-effectiveness.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, O&M costs were calculated for the estimated life of each alternative. The total estimated present-worth cost for implementing the selected remedy is \$7,328,000.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective (NCP Section 300.430(f)(1)(ii)(D)) in that it is the least-costly alternative that comprehensively addresses contaminated vadose-zone soil as a source of groundwater contamination and achieves the remediation goals within a reasonable time frame. EPA expects that the remedial alternative selected will also reduce contaminant mass in the shallow saprolite zone. The results of the analysis support the use, for planning and estimating purposes, of an estimate of a 10-year timeframe to remediate contaminated vadose-zone soil as well as shallow saprolite zone, although remediation timeframes could exceed or be shorter in duration than this estimate.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in the NCP Section 300.430(f)(1)(i)(B), because they each represent the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site. The selected remedy satisfies the criteria for long-term effectiveness and permanence by removing contaminant mass with elevated levels of VOC concentrations. The combination of SVE, DPE, and *in-situ* treatments at the soil source areas permanently reduces the mass of contaminants in soil and groundwater, thereby reducing the toxicity, mobility, and volume of contamination.

Preference for Treatment as a Principal Element

By using a combination of technologies, to the maximum extent practicable, the statutory preference for remedies that employ treatment as a principal element is satisfied through the use

of SVE, DPE, and other *in-situ* treatment to address the vadose zone as well as the shallow saprolite zone.

Five Year Review Requirements

For OU-1, the remedy for the vadose zone soils has unrestricted use and unlimited exposure as the remedial objective. Because it may require more than five years to reach that objective, EPA expects to conduct five-year reviews for OU-1 until RAOs are achieved within the vadose zone soils. The OU-1 remedy addresses the most highly contaminated portion of the groundwater plume, and the OU-2 remedy will evaluate the remainder of the groundwater plume. The need for a five-year reviews for groundwater will be assessed in OU-2.

DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED ALTERNATIVE OF PROPOSED PLAN

The Proposed Plan for the Site was released for public comment on August 12, 2015, and the public comment period ran from that date through October 24, 2015. The Proposed Plan identified the selected remedy as the preferred alternative for the Site.

All written and verbal comments submitted during the public comment period were reviewed by EPA. See the Responsiveness Summary set forth in Attachment VII. Upon review of these comments, EPA has determined that no significant changes to the proposed remedy, as it was originally identified in the Proposed Plan, is necessary.

APPENDIX I

PROPOSED PLAN

San German Groundwater Contamination Superfund Site

OU-1

Superfund Program Proposed Plan

San German Groundwater Contamination Superfund Site (OU-1)

San German, Puerto Rico

August 2015



EPA Region 2

EPA ANNOUNCES PROPOSED CLEANUP PLAN

This Proposed Plan describes the remedial alternatives developed for the San German Groundwater Contamination Superfund Site (the Site) in San German, Puerto Rico, and identifies the preferred remedy for the Site with the rationale for this preference. This document was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for Site activities, in consultation with the Puerto Rico Environmental Quality Board (PREQB), the support agency. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund), 42 U.S.C. § 9617(a), and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The nature and extent of the contamination at the Site and the remedial alternatives summarized in this document are described in detail in the Remedial Investigation (RI) and Feasibility Study (FS) reports. EPA is addressing the Site in two operable units (OUs). OU-1 addresses identified soil contamination that acts as a continuing source of groundwater contamination, including soil in the vadose zone (above the water table) and soil and highly contaminated groundwater below the water table in the shallow saprolite zone (soils and highly weathered rock). OU-2 will address the site-wide groundwater contaminated plume, which will be addressed in a second phase of the cleanup.

MARK YOUR CALENDAR

PUBLIC MEETING

August 19, 2015 at 6:00 pm

Santa Marta Basketball Court, San German

PUBLIC COMMENT PERIOD

August 12, 2015-September 11, 2015

INFORMATION REPOSITORY

The administrative record file, which contains copies of the Proposed Plan and supporting documentation, is available at the following locations:

San German City Hall**Hours: Monday – Friday 9:00 am to 3:00 pm**

**U.S. Environmental Protection Agency
City View Plaza II- Suite 7000**

#48 PR-165 Km. 1.2**Guaynabo, PR 00968-8069****(787) 977-5865****Hours: Monday – Friday 9:00 am to 5:00 pm****By appointment.**

**Puerto Rico Environmental Quality Board
Emergency Response and Superfund
Program**

Edificio de Agencias Ambientales Cruz A. Matos**Urbanización San José Industrial Park****1375 Avenida Ponce de León****San Juan, PR 00926-2604****(787) 767-8181 ext 3207****Hours: Monday – Friday 9:00 am to 3:00 pm****By appointment.**

U.S. EPA Records Center, Region 2

290 Broadway, 18th Floor**New York, New York 10007-1866****(212) 637-4308****Hours: Monday-Friday – 9:00 am to 5:00 pm****By appointment.**

Two locations in the Retiro Industrial Park, owned by the Puerto Rico Industrial

Development Company, were identified as containing sources of contamination. These two properties are currently occupied by Wallace Silvermiths de P.R., Inc. (Wallace), and CCL Insertco de PR (CCL). These lots will be referred to as the Wallace lot and the CCL lot in this document.

EPA's preferred remedy for the Site consists of the following FS alternative to address sources contamination at the Site:

- Alternative S3 - Soil Vapor Extraction (SVE) and Dual Phase Extraction (DPE)/In Situ Treatments at the properties currently operated by Wallace and CCL.

This remedy also includes institutional controls that would restrict exposure to the soil at the properties currently occupied by the Wallace and CCL lots located at the Retiro Industrial Park.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a 30-day public comment period, which begins with the issuance of this Proposed Plan and concludes on September 11, 2015.

EPA is providing information regarding the investigation and cleanup of the Site to the public through a public meeting and the availability of documents at public repositories, which contain the administrative record file. EPA encourages the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there.

The public meeting to be held during the comment period is to provide information regarding the Site investigations, the alternatives considered and the preferred remedy, as well as to receive public comments. Comments received at the public meeting, as well as written

comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on this Proposed Plan should be addressed to:

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SCOPE AND ROLE OF ACTION

EPA is addressing the cleanup of this Site in two phases, OU-1 and OU-2. This is the first planned of two remedial action for the Site, addressing contaminated soils and shallow, highly contaminated groundwater that acts as ongoing sources of groundwater contamination. The OU-1 source areas also act as a source of vapors that can enter into buildings in the vicinity of the Retiro Industrial Park. By addressing the source areas first, EPA expects to begin to reduce the mass of contamination in the ground, thereby accelerating the overall groundwater cleanup. As discussed below, further investigations of the diffuse groundwater plume (OU-2) are still needed before a remedy for that part of the Site can be selected. By selecting and implementing the OU-1 remedy, EPA will be able to begin to address the Site contamination while completing the latter, OU-2 studies.

Because of the potential for subsurface volatile organic compounds (VOC) vapors entering and affecting current occupants of several buildings at the Retiro Industrial Park, EPA is conducting a separate action to address vapor intrusion (VI), using the Agency's removal action, or emergency response, authority. EPA is coordinating its remedial and removal actions so

that the removal actions will not be inconsistent with EPA's final remedies selected for the Site.

SITE BACKGROUND

Site Description

The Site is located in San German, in southwestern Puerto Rico (Figure 1). VOCs were detected above federal drinking water standards, called Maximum Contaminant Levels (MCLs), in three public water supply wells, identified as Retiro, Lola Rodriguez de Tio I (Lola I), and Lola Rodriguez de Tio II (Lola II). These wells are all located south of the Guanajibo River, between Routes 139 and 360 (Figure 2). These wells were associated with the Puerto Rico Aqueduct and Sewer Authority (PRASA) San German Urbano Water system, which includes a total of seven wells and two surface water intakes.

The Retiro, Lola I, and Lola II wells acted as an independent interconnected supply system with approximately 800 service connections serving approximately 2,280 users as of 2005. The Site includes the Retiro Industrial Park, located approximately one-half mile to the southeast of the affected supply wells. The Industrial Park has been shown to be the source of the VOCs. Several of the buildings in the industrial park are occupied by active businesses that were investigated during the RI.

Site History

From 2001 to 2005, groundwater samples collected by PRASA from the Retiro, Lola I, and Lola II wells regularly exhibited detectable concentrations of tetrachloroethene (PCE) and *cis*-1,2-dichloroethene (*cis*-1,2-DCE). The maximum concentrations of PCE and *cis*-1,2-DCE detected in these wells during this period were 6.4 micrograms per liter ($\mu\text{g/L}$) and 1.2 $\mu\text{g/L}$, respectively.

On January 17, 2006 the Puerto Rico Department of Health (PRDOH) ordered the closure of the Retiro well because of PCE concentrations exceeding the federal MCL of 5 $\mu\text{g/L}$. PCE was

also detected in tap water samples collected from the water distribution system. PRASA closed the Retiro well on January 19, 2006. The Lola I and Lola II wells were taken out of service in about the same time period because of exceedances in levels in those wells, too.

EPA added the San German Groundwater Contamination Site to the National Priorities List (NPL) on March 19, 2008, because of the chlorinated solvents which were found in groundwater that supplies drinking water for local residents.

Topography and Drainage

The municipality of San German is located in the eastern part of the Guanajibo River floodplain. The three closed public supply wells are located adjacent to the river on the south side, at an approximate elevation of 138 feet above mean sea level. The Guanajibo River flows west through the municipality of San German and is the major surface water body in the area.

Geology

The study area lies within the eastern part of the Guanajibo River floodplain, which is bounded to the north and south by highlands of predominantly igneous rocks and serpentinite. Bedrock is overlain by alluvial deposits in the Guanajibo River valley and is generally encountered at the surface in the highlands, and at depths up to 100 feet below the ground surface (bgs) in the river valley.

Within the well field, the serpentinite is encountered at 30 feet bgs. The geologic units exposed or underlying the study area are described below, from youngest to oldest.

- Alluvium Soils (Quaternary) – Alluvial deposits, also known as the overburden, occur in the Guanajibo River valley and along tributaries, and are made up of sand, clay, and gravel. Deposits are generally less than 100 feet thick.
- Saprolite – This unit is composed of saturated sands, silts, clays, and highly

weathered rock with an increasing percentage of rock fragments with depth.

- Unstable Zone – A highly fractured and unstable layer, possibly composed of the underlying serpentinite, is found below the saprolite.
- Serpentinite or Serpentinized Peridotite (late Jurassic and early Cretaceous age or older) - highly fractured and faulted.

Hydrogeology

The aquifer within the study area is part of the Guanajibo River alluvial valley. Groundwater is first encountered in the saprolite (sands, silts, clays and weathered rock), and the depth to water ranges from river level at the Río Guanajibo to about 15 to 25 feet bgs. The main aquifer in the saprolite and highly fractured bedrock is under both confined and semi-confined conditions. The general direction of groundwater flow from the source areas is to the north-northwest, and there is some indication that the aquifer is hydraulically connected to the Río Guanajibo.

The Unstable Zone appears to be highly transmissive and can probably be grouped with the fractured serpentinite zone below it; however, this layer has been too unstable to support well installation, and further investigations of this layer are required as part of the OU-2 RI/FS.

Land Use

The municipality of San German is comprised of 54.51 square miles with a population of 35,527 (U.S. Census 2010). The primary land use in the vicinity of the Site is agricultural with some residential, commercial, and light industrial development.

Ecology

As the Site is comprised of residential, agricultural, commercial, and industrial developments, most undeveloped land parcels are situated along the Guanajibo River, the major surface water body in the area. The river valley is flanked to the north and south by uplands. The Guanajibo River flows from east to west through

San German, and is joined by smaller unnamed tributaries within the study area. One of these tributaries originates in the highlands southeast of the Site and flows west, then north, toward the river. Little viable habitat is present within upland portions of the Site because of development. In general, the river banks are heavily vegetated and moderately to steeply sloped, depending on the reach. The majority of both the north and south banks of the river within the area of the Site have been subjected to disturbance activities associated with development. Ecological studies associated with the Site focused primarily on areas adjacent to the River. No known occurrences of listed rare, threatened, and/or endangered species or critical habitats have been identified.

EARLY SITE INVESTIGATIONS

2006 to 2008 - EPA Activities

In June 2006 EPA collected groundwater samples from operational wells and analyzed for a wide range of chemicals, including pesticides, metals, VOCs, and semivolatile organic compounds. This sampling reflected the presence of PCE (1.6 µg/L), *cis*-1,2-DCE (1.5 µg/L), and trichloroethene (TCE) (0.54 µg/L). In addition, PCE was detected at an estimated concentration (below the sample quantitation limit) in the Lola II well. EPA was unable to collect a sample from the Retiro well because the pump was removed in February 2006 as part of the response to PRDOH's closure order.

In July 2006, EPA conducted reconnaissance activities at 44 industrial sites in the San German area as part of a Site Discovery Initiative to identify hazardous waste sites that could be potential sources of contamination. This led to the identification of several locations in San German that were investigated further as part of EPA's Site studies.

NATURE AND EXTENT OF CONTAMINATION

The nature and extent of contamination in Site media was assessed during the RI by collecting and analyzing samples and then comparing analytical results to federal, Commonwealth, and Site-specific screening criteria. Five chemicals were identified as Site-related contaminants: PCE, TCE, *cis*-1,2-DCE, 1,1-dichloroethene (1,1-DCE) and vinyl chloride. These five VOCs were detected the most frequently, and at the highest levels, in source area soil samples and other affected media including groundwater, surface water, and sediment. These chemicals include chlorinated solvents and degradation products of those solvents. The RI also investigated the Site for the presence of Site contaminants in the form of nonaqueous phase liquids. Because Site contaminants are chlorinated VOCs that are denser than water, they are also referred to as dense, nonaqueous phase liquids (DNAPLs).

As part of the RI, soil, groundwater, surface water, sediment, and/or soil vapor were sampled at numerous locations at the Site. Sampling was conducted at four facilities within the Retiro Industrial Park (Wallace, Pitusa, Former Baytex, and CCL) and a fifth facility, Acorn Dry Cleaner, located to the west of the Industrial Park. In addition, soil vapor samples were collected in some residences within the area. Two rounds of sub-slab soil vapor sampling were performed.

It should be noted that OU-2 is ongoing and will gather additional information that will allow EPA to address the groundwater contamination, more thoroughly. As such, this Proposed Plan focuses on the sources of contamination, since they are the subject of the OU-1 action. Some of the data obtained during the OU-1 RI is groundwater data, and it is being presented in this document in order to show the impact of the contaminated soil at the identified sources to the groundwater.

In addition to the soil, groundwater and vapor sampling performed in developed areas of the

Site, and surface water, pore water, and sediment samples were collected from the Río Guanajibo and its tributaries. Finally, samples were collected from surface water and sediment from catch basins adjacent to El Retiro Industrial Park.

The results of the sampling events are discussed below.

Summary of Soil Contamination

- PCE and TCE were frequently detected at elevated levels at the Wallace lot (Figure 3); PCE was detected in nearly every sample. The highest concentration was 46,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$). The highest concentration of TCE was 2,300 $\mu\text{g}/\text{kg}$; *cis*-1,2-DCE, vinyl chloride, and 1,1-DCE were detected less frequently than TCE.
- PCE was frequently detected below the screening criterion at the property currently occupied by Pitusa within the Retiro Industrial Park (Figure 4); one concentration exceeded the criterion at 130 $\mu\text{g}/\text{kg}$. TCE, *cis*-1, 2-DCE, and 1, 1-DCE detections were below the screening criteria.
- PCE was detected frequently but was generally below the screening criterion at the Former Baytex property in the Retiro Industrial Park (Figure 5); six samples exceeded the criterion, with the highest detection at 180 $\mu\text{g}/\text{kg}$. TCE and *cis*-1, 2-DCE did not exceed criteria.
- PCE was detected in three samples at CCL lot (Figure 6); one detection, at 71 $\mu\text{g}/\text{kg}$ exceeded the screening criterion. In contrast to other soil results, TCE at the CCL lot was more frequently detected than PCE. TCE was detected in 23 of 39 samples with a maximum of 3,600 $\mu\text{g}/\text{kg}$. *cis*-1,2-DCE was generally lower than TCE. The highest *cis*-1,2-DCE concentration was 4,400 $\mu\text{g}/\text{kg}$. Vinyl chloride was detected in five samples; the highest concentration was 520 $\mu\text{g}/\text{kg}$.
- PCE was detected at the property currently occupied by Acorn, west of the

Industrial Park, at very low levels (less than 1 µg/kg) in two samples and was not detected in two samples (Figure 7). TCE and *cis*-1,2-DCE results showed low level detections and no detections, respectively. Vinyl chloride and 1,1-DCE were both non-detect.

In addition to the VOCs described above, soil sampling identified metals, including chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc, throughout the soil column. Metals were found at statistically similar levels across the Site, suggestive of a distribution of metals associated with the local soil (natural background) rather than attributable to a release.

Summary of Soil Vapor Contamination

- PCE was detected in 41 of 44 sub-slab samples collected in the first round and exceeded the screening criterion of 94 micrograms per cubic meter (µg/m³) in 10 samples, 7 of which were at the Former Baytex and CCL lots. PCE detections ranged from 0.04 µg/m³ to 27,000 µg/m³.
- TCE was detected in 16 sub-slab samples and exceeded the screening criterion of 4.3 µg/m³ in 10 samples, 9 of which were at the Former Baytex and CCL lots. TCE detections ranged from 0.041 µg/m³ to 7,100 µg/m³.
- In the 39 indoor air samples, PCE was detected in 23 samples, none of which exceeded the screening criterion of 9.4 µg/m³. PCE detections ranged from 0.048 µg/m³ to 1.7 µg/m³.
- TCE was detected in 5 indoor air samples and exceeded the 0.43 µg/m³ screening criterion in 1 sample at a facility within the Retiro Industrial Park. TCE detections ranged from 0.043 µg/m³ to 0.88 µg/m³.
- In the 43 sub-slab samples as part of the second round, PCE was detected in all samples and exceeded the screening criterion of 94 µg/m³ in 31 samples, 28 of which were at the Wallace, CCL, and

Former Baytex lots. PCE detections ranged from 1.42 µg/m³ to 14,200,000 µg/m³. The highest detection was at the Wallace lot.

- TCE was detected in 42 subslab samples and exceeded the screening criterion of 4.3 µg/m³ in 10 samples, all of which were at the Wallace, CCL and Former Baytex lots.
- TCE detections ranged from 0.195 µg/m³ to 726,000 µg/m³ in subslab. The highest detection was at the Wallace lot.
- In the 33 indoor air samples collected in round 2, PCE was detected in 23 samples, none of which exceeded the 9.4 µg/m³ screening criterion. PCE detections in indoor air samples ranged from 7.46 µg/m³ to 0.317 µg/m³.
- TCE was detected in 21 indoor air samples and exceeded the 0.43 µg/m³ screening criterion in 10 samples. TCE detections ranged from 0.167 µg/m³ to 2.11 µg/m³. The highest concentration was detected in a residence. Using a non-cancer TCE criterion of 2.0 µg/m³, one sample exceeded the criterion. At this location, the indoor sample result was higher than the subslab result, indicating the probability of an indoor source for the TCE.

Summary of Groundwater Contamination

- Nine of 10 soil borings at the Wallace lot encountered groundwater (Figure 3). PCE was elevated in 7 samples; the highest was 7,960 µg/L. TCE was detected in 8 samples with a high of 900 µg/L. The highest detections of *cis*-1,2-DCE, vinyl chloride, and 1,1-DCE were 1,310 µg/L, 190 µg/L, and 72 µg/L, respectively.
- Nine of the 10 borings at CCL encountered groundwater (Figure 6). PCE was detected in 4 samples; the maximum concentration was 450 µg/L. TCE and *cis*-1,2-DCE were detected in all 9 samples. The maximum concentrations were 27,700 µg/L and

5,560 µg/L, respectively. Vinyl chloride and 1,1-DCE were each detected in one sample at 25.2 µg/L and 1.89 µg/L, respectively.

- Forty-three groundwater samples were collected at 37 locations along 11 transects (Figure 8) between the Retiro Industrial Park in the southeast and the closed public supply wells to the northwest. PCE was detected in most samples except transects T0 and T1, with the highest concentration in transect T3 at 26,800 µg/L. TCE was frequently detected, including in transects T0 and T1 where PCE was not detected. The highest concentration was in transect T2 at 65,400 µg/L. Detections of *cis*-1,2-DCE were similar to TCE with the highest concentration in transect T4 at 203 µg/L. Vinyl chloride was detected in two samples, one each from transects T1 and T4; the maximum concentration was 6.41 µg/L. 1,1-DCE was frequently detected in transects T3 through T8 (except T6); the highest concentration was 126 µg/L.
- PCE was detected in round one out of two groundwater samples at all 9 shallow wells sampled (Figure 9); the highest concentration was in MW-2S at the Wallace lot (13,000 µg/L). PCE concentrations decrease as the plume migrates downgradient to the northwest toward the public supply wells.
- TCE concentrations were the highest in MW-3S at CCL lot (1,700 µg/L) with levels rapidly decreasing to the northwest in the aligned monitoring well network.
- Two *cis*-1,2-DCE concentrations exceeded the screening criterion, with the highest in MW-3S at CCL (220 µg/L) and the second exceedance in MW-5S at 100 µg/L.
- Vinyl chloride was detected in 2 monitoring wells, with a maximum concentration of 47 µg/L in MW-3S.
- 1,1-DCE was detected in 7 of the 9 shallow monitoring wells; the highest concentration was in MW-6S at 41 µg/L.

Two detections exceeded the screening criterion.

Summary of Surface Water/Sediment Contamination

- In the river/tributary surface water samples (Figure 10) collected in August 2014 showed PCE detection in samples SW-10 through SW-12; the highest detection was 14 µg/L in SW-12. TCE, *cis*-1,2-DCE, and vinyl chloride were detected in SW-9 through SW-12, with the highest at 42 µg/L, 37 µg/L, and 21 µg/L, respectively. 1,1-DCE was detected at trace levels in these four samples.
- In January 2014, surface water samples were collected at locations SW-9 through SW-12. The maximum detections of PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride were 32 µg/L, 98 µg/L, 36 µg/L, 0.55 µg/L and 8.7 µg/L, respectively. These four samples were collected from a small drainage channel on the northeastern side of the CCL and Former Baytex buildings within the Retiro Industrial Park.
- In catch basin water samples, PCE was detected in three samples; one exceeded the screening criterion at 88 µg/L at CBSW-4. All other detections were below 1 µg/L. TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride were detected in the same four samples, with the highest at 15 µg/L, 9.2 µg/L, 0.17 µg/L, and 1.8 µg/L, respectively. Three of the TCE detections exceeded the screening criterion, and all of the vinyl chloride detections exceeded its criterion.

In addition to the VOCs described above, soil sampling identified metals, including chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc, throughout the soil column. Metals were found at statistically similar levels across the Site, suggestive of a distribution of metals associated

WHAT IS RISK AND HOW IS IT CALCULATED?Human Health Risk Assessment:

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a “one-in-ten-thousand excess cancer risk;” or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6} , corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For non-cancer health effects, a “hazard index” (HI) is calculated. The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

with the local soil (natural background) rather than attributable to a release.

SUMMARY OF SITE RISKS

The purpose of the risk assessment is to identify potential cancer risks and non-cancer health hazards at the Site assuming that no further remedial action is taken. A risk assessment was performed to evaluate current and future cancer risks and non-cancer health hazards based on the results of the RI. A screening-level ecological risk assessment was also conducted to assess the risk posed to ecological receptors as a result of Site-related contamination.

Human Health Risk Assessment

As part of the RI/FS, a baseline human health risk assessment was conducted to estimate the risks and hazards associated with the current and future effects of contaminants on human health and the environment. A baseline human health risk assessment is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these under current and future land uses.

A four-step human health risk assessment process was used for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box “What is Risk and How is it Calculated”).

The baseline human health risk assessment began with selecting COPCs in the various media (*i.e.*, surface soil, subsurface soil, groundwater, sediment and surface water) that could potentially cause adverse health effects in exposed populations. The current and future land use scenarios included the following exposure pathways and populations:

- Site Worker (adult): current ingestion, dermal contact, and inhalation of soil particles and vapors for surface soil from

the Wallace and CCL lots, and future ingestion, dermal contact and inhalation of soil particles and vapors for surface soil from the Wallace, CCL, Acorn Dry Cleaners, Former Baytex and Pitusa-National Lumber properties.

- Residents (child/adult): future ingestion, dermal contact and inhalation of soil particles and vapors for surface soil from the Wallace, CCL, Acorn Dry Cleaners, Former Baytex and Pitusa-National Lumber lots.
- Recreational (adolescent 12-18): current/future ingestion and dermal contact for surface water and sediment from the Rio Guanajibo.
- Trespassers (adolescent 12-18): current ingestion, dermal contact, and inhalation of soil particles and vapors for surface soil from the Wallace and CCL lots, and future ingestion, dermal contact and inhalation of soil particles and vapors for surface soil from the Wallace, CCL, Acorn Dry Cleaners, Former Baytex and Pitusa-National Lumber lots.
- Construction Workers (adult): future ingestion, dermal contact, and inhalation of soil particles and vapors for both surface and subsurface soil from the Wallace, CCL, Acorn Dry Cleaners, Former Baytex and Pitusa-National Lumber lots.

In this assessment, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on the reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures. Central tendency exposure (CTE) assumptions, which represent typical average exposures, were also developed. A complete summary of all exposure scenarios can be found in the baseline human health risk assessment.

Surface Soil

Risks and hazards were evaluated for current and/or future exposure to surface soil. The populations of interest included adult Site workers, child and adult residents, adolescent trespassers, and adult construction workers for the following five properties of interest. The estimated hazards and risks are presented in Table 1.

Wallace – The potential current hazards and risks for workers and trespassers at the Wallace lot is above the acceptable hazard index of 1. The potential current risk for these workers is above the acceptable risk range and for current trespassers it is within the acceptable risk range. The potential future hazards and risks for workers and residents exposed to surface soil at the Wallace lot exceed the acceptable hazard index of 1 and the cancer risk range. Additionally, the hazards for future trespassers exceed the acceptable hazard index of 1 and the cancer risk is within the acceptable risk range. All of the chemicals responsible for the exceedances, vanadium, chromium, and cobalt, are not Site-related, and the risks and hazards can be attributed to background. These metals are not considered to be COCs for the Wallace lot. Although there were no Site-related compounds identified for direct contact exposure, TCE and PCE are identified in surface soils. These compounds have been linked to elevated soil gas concentrations found below the building and in elevated concentrations in groundwater. Thus, only TCE and PCE have been determined to be COCs in soil.

CCL – The potential current hazards and risks for workers at the CCL lot is below the acceptable hazard index of 1, but above the acceptable risk range. The current hazards and risk for current trespassers is below the acceptable hazard index of 1 and within the acceptable risk range. The potential future hazards and risks for workers and residents exposed to surface soil at the CCL lot exceed the acceptable hazard index of 1 and the cancer risk range. Additionally, the hazards for future trespassers exceed the acceptable hazard

index of 1 and the cancer risk is within the acceptable risk range. All of the chemicals responsible for the exceedances, vanadium, chromium, and cobalt, are not Site-related, and the risks and hazards can be attributed to background. These metals are not considered to be COCs for the CCL lot. Although there were no Site-related compounds identified for direct contact exposure, TCE and PCE were identified in surface soils. These compounds have been linked to elevated soil gas concentrations found below the building and to elevated concentrations in groundwater. Thus, only TCE and PCE have been determined to be COCs in soil.

Acorn Dry Cleaners – The potential future hazards and risks for workers and residents exposed to surface soil at the Acorn Dry Cleaners property exceed the acceptable hazard index of 1, and for residents it also exceeded the cancer risk range. Additionally, the hazards for future trespassers at the Acorn Dry Cleaners property exceed the acceptable hazard index of 1 and the cancer risk for workers and trespassers are within the acceptable risk range. All of the chemicals responsible for the exceedances, vanadium, chromium, and cobalt, are not Site-related, and the risks and hazards can be attributed to background. Therefore, no COCs were identified for the Acorn Dry Cleaners property.

Former Baytex – The potential future hazards and risks for workers and residents exposed to surface soil at the Former Baytex property exceed the acceptable hazard index of 1 and the cancer risk range. Additionally, the hazards for future trespassers at the Former Baytex property exceed the acceptable hazard index of 1, and the cancer risk is within the acceptable risk range. All of the chemicals responsible for the exceedances, vanadium, chromium, and cobalt, are not Site-related, and the risks and hazards can be attributed to background. Therefore, no COCs were identified for the Former Baytex property.

Pitusa-National Lumber – The potential future hazards and risks for workers and residents exposed to surface soil at the Pitusa-National

Lumber property exceed the acceptable hazard index of 1 and the cancer risk range. Additionally, the hazards for future trespassers at the Pitusa-National Lumber property exceed the acceptable hazard index of 1 and the cancer risk is within the acceptable risk range. All of the chemicals responsible for the exceedances, vanadium, chromium, cobalt and silver, are not Site-related, and the risks and hazards can be attributed to background. Therefore, no COCs were identified for the Pitusa-National Lumber property.

The potential for lead in surface soils was evaluated separately for each of the five above-mentioned lots in surface soil and there were no concentrations detected above EPA protective screening values. Therefore, lead is not a COC at any of the lots.

Table 1. Summary of hazards and risks associated with surface soil.

Receptor	Hazard Index	Cancer Risk
<i>Wallace Property</i>		
Site Worker – current	3.61	2.7x10⁻⁴
Site Worker – future	3.93	2.3x10⁻⁴
Resident adult – future	5.96	1.1x10⁻³
Resident child – future	56.9	
Trespasser – current	3.38	6.0x10 ⁻⁵
Trespasser – future	3.64	5.3x10 ⁻⁵
<i>CCL Label Property</i>		
Site Worker – current	0.66	2.0x10⁻⁴
Site Worker – future	3.08	2.7x10⁻⁴
Resident – future	4.53	1.3x10⁻³
Resident child – future	45.5	
Trespasser – current	0.60	4.4x10 ⁻⁵
Trespasser – future	2.88	6.1x10 ⁻⁵

Receptor	Hazard Index	Cancer Risk
<i>Acorn Dry Cleaners Property</i>		
Site worker – future	3.18	9.9x10 ⁻⁵
Resident adult – future	4.47	4.7x10⁻⁴
Resident child – future	47.3	
Trespasser – future	2.99	2.2x10 ⁻⁵
<i>Former Baytex Property</i>		
Site worker – future	2.6	1.7x10⁻⁴
Resident adult – future	3.69	8.2x10⁻⁴
Resident child – future	38.5	
Trespasser – future	2.43	3.9x10 ⁻⁵
<i>Pitusa-National Lumber</i>		
Site worker – future	2.64	1.5x10⁻⁴
Resident adult– future	3.8	7.2x10⁻⁴
Resident child – future	39	
Trespasser – future	2.47	3.5x10 ⁻⁵
There were no COCs identified in the surface soil at the Acorn Dry Cleaner, Former Baytex or Pitusa-National Lumber properties. TCE and PCE were identified as COCs for the Wallace and CCL lots due to their connection to elevated slab soil gas and contaminated groundwater.		

Combined Surface/Subsurface Soil

Risks and hazards were evaluated for the potential future exposure to surface and subsurface soil. The population of interest included adult construction workers at each of the five properties of interest. The cancer risks were below or within the EPA acceptable ranges. The non-cancer hazards at each of the properties were above the EPA acceptable value of 1. The COC identified in the surface/subsurface soil was vanadium (Table 2). Vanadium was not considered to be a Site-related contaminant, and

the risks and hazards can be attributed to background. As with the surface soils discussion above, TCE and PCE were identified in subsurface soils, and these compounds have been linked to elevated soil gas concentrations found below buildings and to elevated concentrations in groundwater. Thus, TCE and PCE have been determined to be COCs in soil.

Table 2. Summary of hazards and risks associated with surface/subsurface soil.

Receptor	Hazard Index	Cancer Risk
<i>Wallace Property</i>		
Construction Worker – future	5.03	1.3x10 ⁻⁵
<i>CCL Label Property</i>		
Construction Worker - future	2.19	1.4x10 ⁻⁵
<i>Acorn Dry Cleaner Property</i>		
Construction Worker – future	3.99	3.8x10 ⁻⁶
<i>Former Baytex Property</i>		
Construction Worker – future	3.26	8.5x10 ⁻⁶
<i>Pitusa-National Lumber Property</i>		
Construction Worker – future	3.5	6.1x10 ⁻⁶
There were no COCs identified in the surface/subsurface soil for construction workers.		

Groundwater

Risks and hazards were evaluated for the potential future exposure to groundwater. The populations of interest included adult site workers and residential adults and children at each of the five properties of interest. The cancer risks were above the EPA acceptable ranges. The non-cancer hazards at each of the properties were above the EPA acceptable value of 1. The COCs identified in the groundwater were TCE, PCE, and vinyl chloride. The groundwater remedy

will be addressed in a separate decision document.

Table 3. Summary of hazards and risks associated with groundwater.

Receptor	Hazard Index	Cancer Risk
<i>Wallace Property</i>		
Site Worker – future	16.8	2.7×10^{-4}
Resident adult – future	128	2.0×10^{-3}
Resident child - future	124	
<i>CCL Label Property</i>		
Site Worker – future	16.8	2.7×10^{-4}
Resident adult – future	128	2.0×10^{-3}
Resident child - future	124	
<i>Acorn Dry Cleaners Property</i>		
Site worker – future	16.8	2.7×10^{-4}
Resident adult – future	128	2.0×10^{-3}
Resident child - future	124	
<i>Former Baytex Property</i>		
Site worker – future	16.8	2.7×10^{-4}
Resident adult – future	128	2.0×10^{-3}
Resident child - future	124	
<i>Pitusa-National Lumber</i>		
Site worker – future	16.8	2.7×10^{-4}
Resident adult – future	128	2.0×10^{-3}
Resident child - future	124	
The COCs identified in the groundwater were PCE, TCE, and vinyl chloride. Arsenic and vanadium were not considered to be site-related.		

Surface Water and Sediment

Risks and hazards were evaluated for the potential future exposure to surface water and sediment in the Rio Guanajibo. The population of interest included adolescent recreators. The cancer risks were below or within the EPA acceptable ranges. The non-cancer hazards were below or slightly above the EPA acceptable value of 1. The sum of the hazard quotients slightly exceed 1 for the sediment pathway, however, no individual chemical or chemicals that act on the same target organ were above a value of 1. Therefore, there were no COCs identified in the surface water or sediment.

Table 4. Summary of hazards and risks associated with surface water and sediment.

Receptor	Hazard Index	Cancer Risk
<i>Rio Guanajibo</i>		
Recreator surface water – current/future	0.26	4.3×10^{-6}
Recreator sediment – current/future	1.2	2.3×10^{-5}
There were no COCs identified in the surface water or sediment.		

Vapor Intrusion

The potential for vapors to volatilize from contaminated groundwater into buildings that are over the groundwater plume was evaluated. Elevated soil gas concentrations of TCE and PCE were detected under several buildings (three commercial buildings and two residential properties). One of the residential properties also had a slight exceedance of the indoor air screening value for TCE. The vapor intrusion pathway will continue to be evaluated and appropriate remedial actions will be taken based on the sampling results.

Ecological Risk Assessment

A screening-level ecological risk assessment (SLERA) was conducted to evaluate the potential for ecological risks from the presence of contaminants in surface soil. The SLERA focused on evaluating the potential for impacts to sensitive ecological receptors to Site-related constituents of concern through exposure to surface soil on the properties and surface water, sediment, and pore water from Rio Guanajibo. Surface soil, surface water, sediment and pore water concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. A complete summary of all exposure scenarios can be found in the SLERA.

Surface Soil: There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to surface soil at the five properties. The surface soil screening criteria were exceeded for metals (chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, vanadium and zinc), which resulted in HIs greater than the acceptable value of 1. However, none of the metals were considered to be Site-related, therefore there were no COCs selected for surface soil from any of the properties.

Surface Water: There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to surface water in the Rio Guanajibo. The surface water screening criteria were exceeded for metals (aluminum, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, silver, vanadium and zinc) and three volatile organic compounds (chloroform, toluene and TCE), which resulted in HIs greater than the acceptable value of 1. The metals were not considered to be site-related and were not selected as COCs. The elevated concentration of TCE in surface water was located near a drainage area adjacent to Retiro Industrial Park, in an area with limited viable habitat. Therefore, no adverse effects on survival, growth and/or reproduction of aquatic

organisms are expected to occur, and no COCs were identified for surface water.

Sediment: There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to sediment in the Rio Guanajibo. The surface soil screening criteria were exceeded for metals (antimony, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, nickel, silver and zinc), which resulted in HIs greater than the acceptable value of 1. However, none of the metals were considered to be site-related, therefore, there were no COCs selected for sediment from the Rio Guanajibo.

Pore Water: There is a potential for adverse effects to ecological receptors (invertebrates, reptiles, amphibians, birds, and mammals) from exposure to pore water in the Rio Guanajibo. The surface water screening criteria were exceeded for metals (aluminum, barium, chromium, cobalt, copper, iron, lead, manganese, nickel and vanadium), which resulted in HIs greater than the acceptable value of 1. However, none of the metals were considered to be site-related, therefore there were no COCs selected for pore water from the Rio Guanajibo.

Based on the results of the ecological risk assessment, no remedial action is necessary to protect the environment from actual or threatened releases of hazardous substances.

Risk Assessment Summary

Based on the results of the human health risk assessment, a remedial action is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances to groundwater and, as an ongoing source of VOC contamination to the groundwater, in soils at the Wallace and CCL lots. Furthermore, soil and groundwater in the vicinity of these lots are a source of subsurface vapors that may result in unacceptable human exposures through the vapor intrusion pathway.

Based upon the results of the human health and ecological risk assessments, a remedial action is not necessary for the surface water or sediment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels. The Site-related contaminants are chlorinated ethenes and their degradation products, including PCE, TCE, *cis*-1,2-DCE, vinyl chloride, and 1,1-DCE. The contaminated media addressed in this Proposed Plan are soil that act as a source of groundwater contamination and soil vapors.

EPA has a statutory preference to use treatment to address any principal threats posed by a site. Principal threat wastes are those source materials considered to be highly toxic or mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

At both the Wallace and CCL lots, PCE and TCE concentrations were detected in groundwater samples, indicating contaminants have migrated from the unsaturated soil to the saturated soil and groundwater. Considering the high concentrations present in the saturated soil that underlies the source areas at these lots, data indicate that a large contaminant mass is present in the saturated soil. Therefore, PCE and TCE contamination in the vadose zone fits the definition of principal threat waste and would require remediation through treatment, where practicable.

The sources of soil contamination identified at Retiro Industrial Park are located on the Wallace and CCL lots. Soil on these two properties, including the shallow saprolite zone of saturated soils below the footprint of the vadose zone contamination, where the contaminants originally contacted groundwater, potentially contains residual DNAPL and likely contains the

highest contaminant mass in the subsurface that can serve as continuing sources for groundwater contamination.

Soil vapor samples show elevated soil vapor under the building slabs at both the Wallace and CCL lots, currently occupied buildings, and as such there is a threat of exposure to contaminants such as PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. These contaminants may pose risks to human health through inhalation, ingestion, and dermal contact. Vapor accumulation beneath the building slabs at the source area and over the groundwater plume has been observed. EPA anticipates that the vapor exposure issues will be addressed separately; therefore, appropriate technologies for mitigating exposures as a result of vapor intrusion, such as subslab mitigation systems, are not included in this proposed action. Should the anticipated vapor response not occur as expected, it can be revisited and addressed during the OU-2 response activities.

To protect human health and the environment, the following RAOs have been identified.

The RAOs for soil are:

- Prevent/minimize contaminated vadose-zone soil from serving as a source of groundwater contamination.
- Reduce contaminant mass in the saturated shallow saprolite zone soil serving as a source for groundwater contamination.

The RAOs for soil vapor are:

- Reduce contaminant mass serving as a source for current and potential vapor intrusion.
- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion.

The soil source areas to be addressed by this action are located above and below the water table, and appear to be as deep as the shallow saprolite zone. RAOs have been developed

separately for unsaturated and saturated soil, as discussed in more detail below.

REMEDICATION GOALS

To meet the RAOs, remediation goals were developed to aid in defining the extent of contaminated soil requiring remedial action. Remediation goals are typically chemical-specific measures for each media and/or exposure route that, if attained, are expected to be protective of human health and the environment. In this case, soil remediation goals were developed to address soils as a source of groundwater and soil vapor contamination, to satisfy the RAOs. They are derived based on comparison to ARARs, risk-based levels, and background concentrations, with consideration also given to other requirements such as analytical detection limits, guidance values, and other pertinent information.

There are no promulgated federal or Commonwealth chemical-specific ARARs for soil. To meet the RAOs for the soil as well as to address soil vapors, soil remediation goals were developed using two parameters: the Site-specific soil-water partitioning coefficient, K_d ; and a Dilution Attenuation Factor (DAF). The soil remediation goals were calculated using a Site-specific soil-partitioning coefficient and the standard DAF of 20. The DAF considers dilution and attenuation factors that reduce contaminant concentrations in soil leachate during migration through the vadose zone. Table 5, at the end of this Proposed Plan, contains the remediation goals for soil based on impact to groundwater.

EPA expects the remedial alternatives considered in this Proposed Plan to address contaminated vadose-zone soil as a source of groundwater contamination comprehensively, and achieve the remediation goals, which are “soil” remediation goals.

Below the water table, EPA expects the remedial alternatives considered to reduce contaminant mass in the shallow saprolite zone; however, the shallow saprolite zone includes a mixture of

contaminated soil and groundwater, and the effectiveness of the treatment technologies considered, which were primarily developed to address the soils, may be limited. EPA expects the implementation of this action, OU-1, to overlap with the selection and implementation of a complementary remedy to address the groundwater in OU-2. By extending the scope of the OU-1 remedial technologies to the full depth of the shallow saprolite zone below the vadose-zone source areas, EPA expects to expedite the overall remediation of the sources to groundwater. EPA expects that a final remedy for the Site, to be selected in OU-2, will reconsider the soil/groundwater in the shallow saprolite zone addressed in OU-1, possibly augmenting or amending the OU-1 action based new information or upon the results the OU-2 RI/FS.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions, which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4).

The time frames presented below for each alternative reflect only the time required to construct and/or implement the remedy and do not include the time required to design the remedy, negotiate the performance of the remedy

with any potentially responsible parties, or procure contracts for design and construction.

The cost estimates, which are based on available information, are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project.

Common Elements

There are several common elements that are included in all active remedial alternatives. With the exception of five-year reviews, the common elements listed below do not apply to the No Action alternatives.

Pre-Design Work

A pre-design investigation (PDI) would be conducted as part of the remedial design. The extent of soil contamination underneath the buildings would be delineated during the PDI. These activities could impact the business operations at the respective facilities, and therefore efforts will be made to minimize interruption of operations.

Vapor Mitigation Systems

As discussed earlier, EPA anticipates that vapor mitigation systems will be installed at the buildings currently occupied by Wallace and CCL to prevent vapor intrusion. Even after the remediation of vadose zone soil, potential soil vapor may continue to accumulate underneath the building slabs and require the operation of the mitigation systems in order to mitigate the risk of soil vapor intrusion into the buildings until the conditions at the Site are fully remediated.

Institutional Controls

While the OU-1 remedy proposed in this document is addressing contaminated soils within the source areas at Retiro Industrial Park as a first action for the Site, contaminated groundwater (including the areas to be addressed in OU-2), is the primary human health concern at the Site. As part of the OU-1 remedy, EPA proposes to establish institutional controls (ICs)

that would restrict contact with contaminated groundwater throughout the area of the plume. By placing ICs on the groundwater at this time, EPA can minimize the potential for human exposure while the final remedy for the Site is selected and implemented.

The types of institutional controls which would be employed for the soil and groundwater at the Site include local laws that limit installation of drinking water wells without a permit, deed restrictions that would limit the use of the Wallace and CCL lots to prevent any soil excavation or well installation. In addition, informational devices such as advisories published in newspapers and periodic letters sent to local government authorities can be used to informing them of the need to prevent soil excavation and well installation in the area within the contaminated plume.

Long-term Monitoring

Periodic monitoring of Site groundwater would be implemented when contaminants remain above levels that allow for unrestricted use and unlimited exposure. The monitoring program would continue until concentrations have met remediation goals. Because the OU-1 and OU-2 remedies are expected to be closely aligned, the scope and extent of long-term monitoring is not considered in OU-1 but will be addressed in OU-2.

Five-Year Reviews

Alternatives resulting in contaminants remaining above levels that allow for unrestricted use and unlimited exposure require that the Site be reviewed at least once every five years. If justified by the review, additional remedial actions may be considered to remove, treat, or contain the contamination. For remedial actions where unrestricted use and unlimited exposure is the remedial objective, it may require many years to reach that objective. It is EPA policy to conduct five-year reviews until remediation goals are achieved.

EPA expects that this Site will require more than five-year reviews; however, because the OU-1 and OU-2 remedies are expected to be closely aligned, the need for five-year reviews will be addressed in OU-2. For OU-1, a remedial action for the vadose zone soils has unrestricted use and unlimited exposure as the remedial objective, and because it may require more than five years to reach that objective, EPA anticipates it will conduct five-year reviews for OU-1 until RAOs are achieved within the vadose zone soils.

EPA Region 2 Clean and Green Policy

The environmental benefits of the preferred remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.¹ This will include consideration of green remediation technologies and practices. Some examples of practices that would be applicable are those that reduce emissions of air pollutants, minimize fresh water consumption, incorporate native vegetation into revegetation plans, and consider beneficial reuse and/or recycling of materials, among others.

Remedial Alternatives

Remedial alternatives were assembled by combining the retained remedial technologies and process options for each contaminated media. The areas for remediation at the Site include:

- The vadose zone with soil contamination exceeding the remediation goals.
- The soil in the saturated soils of the shallow saprolite zone below the footprint of the vadose zone contamination (as described below).

The two areas are collectively referred to as the source zone, which appears to contain the highest contaminant mass in the subsurface and serves as

a continuing source of groundwater contamination.

Five source areas (SA), as shown in Figure 11, were identified based on a review of the RI sampling results and the past practice for storage and usage of chemicals at the Wallace and CCL lots. Specific information for each source area is described below. High sub-slab soil vapor concentrations were detected at the Wallace and CCL lots, and the extent of soil contamination underneath the buildings could be different from and larger than what is shown in Figure 11.

- Source Area 1 (SA-1) located at the Wallace lot: this is the approximate area where drums were historically stored. High PCE and TCE concentrations were found in the sub-slab vapor samples in the vicinity of this area. Therefore, additional soil delineation underneath the building in this area is warranted to further define the extent of contamination.
- Source Area 2 (SA-2) located at the Wallace lot: soil contamination was found in this area outside the buildings as seen in Figure 11. Additional soil delineation underneath the building is warranted in this area to define the extent of the contamination further.
- Source Area 3 (SA-3) located at the Wallace lot: this area encompasses soil where the highest PCE concentrations were detected outside a building under a paved area. The highest PCE concentrations in this source area were detected in samples from the ground surface to 2 feet bgs and from 5 to 7 feet bgs in boring WS-8. The PCE concentrations decreased with depth, indicating the majority of the contaminant mass is held in the shallow unsaturated clay and silt, likely because of the presence of pavement and limited infiltration. Additional soil delineation underneath the building or along the

¹See http://epa.gov/region2/superfund/green_remediation.

subsurface drainage channel is warranted to define the extent of contamination further. Because of the relatively moderate groundwater contaminant concentrations at this location (WS-8 with PCE at 233 µg/L) and the fact that soil concentrations decreased with depth, the saprolite zone is not included in the source zone at this area.

- Source Area 4 (SA-4) located at the CCL lot: elevated TCE and *cis*-1,2-DCE soil contamination was found between 5 and 7 feet bgs. The extent of soil contamination in this area appears to be localized. Additional soil delineation is recommended to define the treatment zone further.
- Source Area 5 (SA-5) located at the CCL lot: elevated TCE concentrations were found in the soil between 10 and 22 feet bgs. In the saturated zone, TCE was found at 27,700 µg/L from 19.5 to 23.5 feet bgs and at 65,400 µg/L from 26.5 to 30.5 feet bgs. The data indicate the possibility of residual DNAPL in the shallow saprolite zone. Additional soil and groundwater samples would be collected during the PDI to define the treatment zone.

Alternative S1 – No Action

Capital Cost	\$0
Present Worth O&M Cost	\$0
Total Present Worth Cost	\$0
Timeframe to meet RAOs	Will not meet RAOs

The No Action alternative is required by the NCP to be carried through the screening process. The No Action alternative would include no action being taken and serves as a baseline for comparison of remedial alternatives.

Alternative S2 – Excavation and Offsite Disposal/*In-Situ* Treatments

Capital Cost	\$12,883,000
Present Worth O&M Cost	\$ 549,000
Total Present Worth Cost	\$ 13,432,000
Construction Time Frame	12 to 18 months
Timeframe to meet RAOs	2.5 years

Because the level and distribution of contamination at each source area is different, not every component of this remedial alternative is anticipated to be applied at each source area. For cost-estimating purposes, the conceptual approach for each area is listed below:

- SA-1: Excavation and off-site disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment in the remainder of the vadose zone from 13 feet bgs to 20 feet bgs. It is estimated that approximately 505 yd³ will be excavated in this area. This area is underneath the building with limited infiltration. For cost estimating purposes, it is assumed the treatment zone is from ground surface to 20 feet bgs.
- SA-2: Excavation and offsite disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment for the remainder of the vadose zone and the shallow saprolite zone. It is estimated that approximately 3,827 yd³ will be excavated in this area.
- SA-3: Excavation and off-site disposal in the vadose zone to 13 feet bgs, followed by *in-situ* treatment for the remainder of the vadose zone to 20 feet bgs. It is estimated that approximately 2,238 yd³ will be excavated in this area. This area is underneath the building and pavement with limited infiltration, contaminant concentrations are decreasing over depth, and the grab groundwater sample from WS-8 revealed PCE and TCE at 233 µg/L and 38.7 µg/L, respectively; therefore, the majority of contaminants are believed to be held in the vadose zone soil. For cost-

estimating purposes, the treatment zone is assumed to be from ground surface to 20 feet bgs.

- SA-4: *In-situ* treatment in the vadose zone soil and shallow saprolite zone from 5 feet bgs to 40 feet bgs. The contaminant level was low in the shallow vadose zone; it is not cost effective to perform excavation at this area.
- SA-5: *In-situ* treatment in the vadose zone soil and the shallow saprolite zone from 5 feet bgs to 40 feet bgs. Soil contaminant concentrations were moderate, and vertical distribution of contaminant concentrations indicate the majority of contaminants have migrated to the shallow saprolite zone. It is not cost effective to perform excavation at this area.

For costing purposes, excavation would be performed to 13 feet bgs at SA-1, SA-2, and SA-3 areas. The exact dimensions of the area to be excavated and volume of soil to be excavated would be determined during the remedial design. The major portions of these three areas are located underneath the buildings or pavement. The concrete slab and pavement covering these areas would need to be demolished before conducting the excavation. The excavated area would be backfilled with imported, clean common fill and properly compacted. The cost estimate also takes into account the reconstruction of the slab following excavation and backfilling activities.

Soil samples would also be collected from the bottom of the excavation for documentation purposes. The effectiveness of excavation would be confirmed with the post-excavation sample results from sidewalls. Two rounds of soil sampling would also be performed, each after one round of in-situ treatment in the vadose zone to evaluate the effectiveness of in-situ treatment. Results from the first round of soil sampling would be used to design the second round of in-situ treatment to areas with contaminant concentrations exceeding the PRGs in the vadose zone soil.

Excavated soils would be disposed of offsite in a Resource Conservation and Recovery Act (RCRA) Subtitle D (non-hazardous) landfill. If the excavated soil is found to be hazardous as determined by toxicity characteristic leaching procedure analysis, it would be shipped to the mainland and properly treated and disposed of. The excavated area would be backfilled with imported clean common fill and properly compacted.

Following the excavation at SA-1 and SA-3, perforated horizontal pipes could be placed at the bottom of the excavation prior to backfill. At each area, these pipes would be combined at a header with a vertical pipe extending to ground surface and connected to a storage tank. Organic amendment solution could be added to this storage tank periodically and gravity fed into the treatment zones to promote *in-situ* anaerobic biological treatments.

At SA-2, contamination is known to have passed to the shallow saturated saprolite zone. Source treatment at the deep vadose zone and the shallow saprolite zone would be conducted simultaneously. Following excavation and backfill, amendment would be injected into boreholes from a depth of 13 feet bgs to 40 feet bgs, spaced 10 feet apart.

The vadose zone soil contamination at SA-4 and SA-5 would be remediated together with the saturated soil using in situ treatment technologies. Similar to what was described for SA-2, amendment would be distributed into the vadose zone soil and the shallow saprolite zone injection spaced 10 feet apart. Amendment distribution for the deeper treatment zone in the shallow saprolite zone would be performed with injection wells.

Monitoring wells would be installed upgradient and downgradient of the treatment zone for the evaluation of treatment effectiveness in the shallow saprolite. MW-2S and MW-3S would be used for performance monitoring if these two wells are confirmed to be outside the treatment zone after the PDI. For cost-estimating purposes,

a total of 10 monitoring wells would be installed. Groundwater and soil samples would be collected prior to treatment and post treatment to evaluate the effectiveness of *in-situ* treatment.

After the completion of this OU1 remedial alternative, all equipment and materials would be removed from the Site. The Site would be restored to prior conditions to the extent possible. The injection and monitoring wells would be retained to be used under OU2 as appropriate.

Alternative S3 – Soil Vapor Extraction and Dual-Phase Extraction /*In-Situ* Treatments

Capital Cost	\$ 5,448,000
Present Worth O&M Cost	\$ 1,880,000
Total Present Worth Cost	\$ 7,328,000
Construction Time Frame	8 months
Timeframe to meet RAOs	At least 10 years

Under this alternative, a pilot study would be performed as part of the PDI to collect the design parameters for the SVE and dual-phase extraction (DPE) system. For the design of a SVE system, an air permeability test would be conducted to determine the Site-specific design parameters, such the achievable air flow rate, the required vacuum to induce the flow, the radius of influence from the applied vacuum, and the initial contaminant removal rates. For the DPE, the achievable sustained groundwater extraction rate and the drawdown would be studied.

This remedial alternative would consist of the following major components:

- Cap Installation at SA-2 and SA-3;
- SVE system installation and operation;
- Dual phase extraction system installation and operation;
- *In-situ* treatments;
- Treatment performance evaluation; and
- Site restoration

Because the level and distribution of contamination at each source area is different, not every component is anticipated to be applied at

each source area. For cost-estimating purposes, the conceptual approach for each area is listed below:

- SA-1: SVE in the vadose zone.
- SA-2: SVE in the vadose zone in conjunction with DPE in the shallow saprolite zone, followed by *in-situ* treatment as described in Alternative S2.
- SA-3: SVE in the vadose zone.
- SA-4: *In-situ* treatments for both the vadose zone and the shallow saprolite as described in Alternative S2.
- SA-5: DPE in the shallow saprolite, followed by *in-situ* treatment in both the vadose zone and the shallow saprolite as described in Alternative S2.

Two existing buildings and paved driveways at the Wallace lot would act as caps for the SVE system to prevent short-circuiting from the atmosphere. Additional impermeable cover could be installed as necessary for the implementation of SVE. Any additional cover would be engineered to limit infiltration of rainwater into the contaminated soils, meaning that durable, low-permeability material would be used, and rainwater would be directed away from the remediation zone. (For cost-estimating purposes, it is assumed no additional cap is needed.)

In source areas SA-1, SA-2, and SA-3, vertical SVE wells would be installed in the vadose zone to target the entire vadose zone contamination without extracting groundwater. For cost-estimating purposes, it is assumed 3, 13, and 8 SVE wells would be installed in SA-1, SA-2, and SA-3, respectively. Nested vapor monitoring wells also would be installed to monitor the progress of contaminant removal and the changes in soil vapor pressure.

Piping for transferring the extracted soil vapor to an above-ground treatment system would be routed underground, along the wall, or overhead to minimize impact to routine building operations. An above-ground treatment system would be installed in a pre-fabricated building

brought on-site to treat the extracted soil vapor prior to discharge to the atmosphere.

For cost-estimating purposes, it is assumed that the SVE system would be operated continuously for the first two years and intermittently for the following eight years.

The DPE system would be installed at SA-2 and SA-5 to reduce the contaminant mass in the shallow saprolite zone prior to implementing other *in-situ* treatment methods. DPE wells would be installed based on the conclusions of the remedial design. For cost-estimating purposes, it is assumed 13 and 4 DPE wells will be installed in SA-2 and SA-5, respectively.

The extracted vapor would be treated using the same vapor treatment system described above for SVE, if possible. The water treatment system also would be installed in the same building that would house the vapor treatment system. This system is anticipated to consist of groundwater extraction pumps, piping, transfer pumps, bag filters, and an air stripper in addition to the air-water separator and vapor phase activated carbon. Treated water would be discharged to the nearby open drainage ditch with an appropriate permit. Discharged water would meet Puerto Rico discharge permit requirements. For cost-estimating purposes, the DPE system is anticipated to be operated for one year.

Following the DPE treatment, the remaining contamination in SA-2 and SA-5 would be remediated with an *in-situ* treatment technology similar to those described in Alternative S2. The vertical intervals for the *in-situ* treatment might be adjusted in accordance with the operation of the SVE system.

In-situ remediation at SA-4 would be performed as described in Alternative S2.

After the completion of each phase of this alternative, equipment and materials would be removed from the Site, and the Site would be restored. The wells would be properly abandoned if necessary. DPE wells and monitoring wells

screened in the shallow saprolite zone would be kept as necessary for OU2.

Alternative S4 – *In-situ* Thermal Remediation and SVE/*In-Situ* Treatments

Capital Cost	\$ 12,741,000
Present Worth O&M Cost	\$ 549,000
Total Present Worth Cost	\$ 13,290,000
Construction Time Frame	1-2 years
Timeframe to meet RAOs	2.5 years

This remedial alternative would consist of the following major components:

- Cap Installation at SA-2, SA-3, and SA-5 (as necessary);
- SVE and *in-situ* thermal remediation (ISTR) system installations and operation;
- Decommissioning of ISTR;
- Treatment performance evaluation;
- *In-situ* treatments; and
- Site restoration.

Because the level and distribution of contamination at each source area is different, not every component is anticipated to be applied at each source area. For cost estimating purposes, the conceptual approach for each area is listed below:

- SA-1: ISTR and SVE in the vadose zone.
- SA-2: ISTR and SVE for both the vadose zone and the shallow saprolite, followed by *in-situ* treatments.
- SA-3: ISTR and SVE in the vadose zone.
- SA-4: *In-situ* treatments for both the vadose zone and the shallow saprolite zone.
- SA-5: ISTR and SVE for both the vadose zone and the shallow saprolite zone, followed by *in-situ* treatments.

Impermeable surface cover would be installed at SA-2, SA-3, and SA-5 areas as necessary. The majority of SA-2 and SA-3 areas are already under buildings or pavement. The building slab and pavement would be inspected and repaired as necessary. SA-5 is partially covered by a parking

lot. The parking lot would be inspected and repaired as necessary, and areas to be remediated with SVE and ISTR would be paved as necessary.

Combined soil vapor extraction and heating wells would be installed at the Wallace lot (SA-1, SA-2, and SA-3) and the CCL lot (SA-5). Electrical Resistance Heating (ERH) and Thermal Conductive Heating (TCH) are the most common methods for thermal remediation of chlorinated solvent contamination. Both ERH and TCH are anticipated to be effective at the Site. For costing purposes, it is assumed ERH will be used.

As a result of space constraints at the Wallace lot, it likely would be difficult to install combined heating and vapor extraction wells in the configuration that vendors have identified as most optimal (12-inch boreholes with an 8-foot radius of influence). For cost-estimating purposes, it is assumed that 12-inch borings would be installed in outdoor areas, in both a vertical configuration and also angled under the building, and 4-inch borings would be installed indoors. Because of the lower surface area of the small-boring electrodes, the radius of influence would be less than the 12-inch boring electrodes.

At the CCL lot, the treatment zone (SA-5) is outside and has minimal space constraints. Thus, it is assumed only 12 borings would be installed at the property. At all the ISTR areas, temperature monitoring points would be installed to monitor the progress of heating in the soil along with additional dedicated soil vapor extraction wells. The existing pavement at the Site would be retained because it serves to inhibit both heat and vapor loss from the subsurface.

Heating of the soils is anticipated to take approximately 100 days, during which the SVE system would be operated to remove volatilized contaminants. Additional sampling and analysis would also be conducted in order to meet the air emission permit requirements. After heating, an approximately 100-day soil cool-down period would be needed prior to removal of the system and abandonment of the wells in SA-1 and SA-3.

The SVE system would be operated during the cool-down period and possibly longer if warranted.

Toward the end of the heating period, soil samples would be collected within the treatment zones for VOC analysis to evaluate the effectiveness of the thermal treatment. For costing purposes, it is assumed that once 90 percent of the source zone mass has been removed (a typical efficiency for *in-situ* thermal remediation), then heating would be complete. *In-situ* treatment would start in SA-2 and SA-5. In SA-1 and SA-3, it is assumed for costing purposes that the SVE system would continue to target residual mass, and a cap would be maintained over the treatment area to prevent short-circuiting and surface water infiltration.

In-situ treatments would be applied in SA-4 as described in Alternative S2. At SA-1, SA-2, SA-3, and SA-5, with extended operation of the SVE system, the vadose zone soil is expected to meet the remediation goals. Therefore, no additional *in-situ* treatment is anticipated to be needed at SA-1 and SA-3. For SA-2 and SA-5, one round of *in-situ* treatment would be conducted in the shallow saprolite zone and possibly the capillary fringe using a combination of direct push technology and injection wells for amendment placement, as described in Alternative S2.

For SA-2 and SA-5, *in-situ* treatment would be conducted in the shallow saprolite zone, starting soon after the ISTR phase, since the residual heat would be conducive to the growth of microbes.

The effectiveness of ISTR in the vadose zone soil would be evaluated by collecting soil samples. The effectiveness of ISTR and *in-situ* treatment would be evaluated by collecting groundwater samples from monitoring wells as described in Alternative S2.

After the completion of the OU-1 remedial action, the heating wells, the soil vapor extraction wells, and soil vapor monitoring points would be properly abandoned. All the equipment and materials would be removed or demobilized.

Wells that could be used for OU-2 would be kept. The Site would be restored.

EVALUATION OF REMEDIAL ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. A detailed analysis of alternatives can be found in the FS.

A comparative analysis of these alternatives based upon the evaluation criteria noted above is presented below. Comparative Analysis of Alternatives

Overall Protection of Human Health and the Environment

Alternative S1, No Action, would not meet the RAOs and would not be protective of the environment since no action would be taken. The contaminated soil would continue to be a source of groundwater contamination and soil vapors.

Alternatives S2, S3 and S4 would meet the RAOs and would be protective of human health and the environment by addressing the source areas, to the extent practicable. Treatment and excavation technologies may not be able to treat all the contamination underneath occupied buildings. If that is the case, the buildings could act as a cap to minimize infiltration of surface water and reduce contaminant migration into groundwater.

Compliance with ARARs

There are no Federal or Puerto Rico chemical-specific ARARs for soil. While not ARARs, the Site-specific remediation goals would be met above the water table by Alternatives S2, S3 and S4, and these technologies would effectively remove contaminant mass below the water table.

Excavation and off-site disposal under Alternative S2 would need to satisfy the land disposal requirements under RCRA. All active alternatives would comply with action-specific ARARs. Action-specific ARARs would not be attained under the No action alternative because no work would be implemented.

NINE EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative would meet all of the applicable or relevant and appropriate requirements of federal and state environmental statutes and other requirements that pertain to the site, or provide grounds for invoking a waiver.
Long-term effectiveness and permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies an alternative may employ.
Short-term effectiveness considers the period of time needed to implement an alternative and the risks the alternative may pose to workers, residents, and the environment during implementation.
Implementability is the technical and administrative feasibility of implementing the alternative, including the availability of materials and services.
Cost includes estimated capital and annual operation and maintenance costs, as well as present-worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Commonwealth acceptance considers whether the Commonwealth (the support agency) concurs with, opposes, or has no comments on the preferred remedy.
Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Comments received on the Proposed Plan are an important indicator of community acceptance.

Long-Term Effectiveness and Permanence

Under the No Action alternative, contamination would continue to be present in the vadose zone and migrate in the soil and potentially impact groundwater at some point in the future. The No Action alternative is not effective or permanent.

For Alternatives S2 and S4, with excavation and thermal remediation plus *in-situ* treatment, a significant degree of permanent mass removal is expected, with a resulting high degree of long-term effectiveness and permanence. For Alternative S3 with DPE/SVE, technical limitations may mean that not all the contamination would be removed from the clayey soil. The radius of influence of SVE wells would be low in clayey soil. Significant diffusion of contamination into the clay is likely to have occurred. The SVE system may need to be operated for a much longer period than estimated in Alternatives S2 and S4 to achieve a similar level of permanent mass removal.

For any contamination underneath a building that is not accessible for excavation or thermal treatment, the buildings would act as a cap to prevent contaminant migration into groundwater.

Reduction of Toxicity, Mobility, or Volume (T/M/V) Through Treatment

The No Action alternative would not reduce contaminant T/M/V because no remedial action would be conducted.

The excavation and thermal remediation alternatives would be expected to significantly reduce T/M/V through treatment. DPE/SVE under Alternative S3 likely would reduce T/M/V through treatment to a degree, but its effectiveness in the tight soils at the Site likely would be limited, and thus, reduction of T/M/V may be limited. The extent and effectiveness of T/M/V reduction by DPE/SVE would need to be verified with monitoring. *In-situ* treatment would enhance T/M/V and is included in Alternatives S2, S3, and S4.

Short-Term Effectiveness

With respect to the No Action alternative, there would be no short-term impact to the community and environment as no remedial action would occur.

There would be significant short-term impacts to the ongoing business on-site, local community, and workers for the remaining alternatives because of the active remedial actions undertaken and associated construction and operation.

Operation at facilities (i.e., Wallace) would need to be modified or temporarily shut down. Excavation would involve truck traffic and noise from heavy equipment operations. Thermal remediation under Alternative S4 would require the presence of substantial piping and treatment elements at the Site for a time period on the order of one year, causing substantial short-term disruption to property use. Similarly, excavation activities under Alternative S2 would cause substantial short-term disruptions and may require temporary business closures for occupied properties in the Industrial Park. By contrast, SVE and other *in-situ* treatment infrastructure (part of all the active alternatives but the bulk of the work to be performed for Alternative S3) would require substantially less short-term disruptions during installation, and while the systems may be present for a number of years, they would not pose significant hardships on property use.

Alternative S3 (DPE/SVE) would have a smaller footprint in terms of short-term effectiveness as opposed to the other two active remediation options. Air monitoring, engineering controls and appropriate worker personal protective equipment would be used to protect the community and workers during the implementation of these alternatives.

Alternatives S2 and S4 would achieve the RAOs in approximately 2.5 years while Alternative S3 is expected to achieve the RAOs in approximately 10 years.

Implementability

The No Action alternative would be easiest both technically and administratively to implement as no additional work would be performed at the Site.

Both Alternative S2 (with thermal remediation) and Alternative S4 (with excavation) face considerable implementation hurdles. Because excavation would be occurring directly inside and adjacent to buildings, shoring and underpinning would be necessary to support the structures during the work. Excavated hazardous waste would have to be shipped to the continental United States because there are no hazardous waste landfills on Puerto Rico.

For thermal remediation, the presence of buildings (with tenants) in the treatment zones also presents challenges regarding implementation, such as installing heating elements inside an active facility. During remedial design, it may be possible to install heating elements either at angles or horizontally into the treatment zone from outside the buildings.

For Alternative S3, the major implementability limitation would be the ability to access the treatment zone based on physical limitations. The limited effectiveness of SVE/DPE in clayey soils is also an implementability concern; however, it is expected that it can be overcome by extending the period of performance out to an estimated 10 years, at which time a comparable level of mass removal can be expected, when compared to the other active alternatives.

Cost

The cost estimates for all alternatives are provided.

Soil Source Alternative	Capital Cost	Present Worth O&M Cost	Total Present Worth Cost
S1	\$ 0	\$0	\$0
S2	\$12,883,000	\$ 549,000	\$13,432,000
S3	\$5,448,000	\$1,880,000	\$7,328,000
S4	\$12,741,000	\$549,000	\$13,290,000

Commonwealth/Support Agency Acceptance

The PREQB agrees with the preferred remedy in this Proposed Plan.

Community Acceptance

Community acceptance of the preferred remedy will be evaluated after the public comment period ends, and it will be described in the Responsiveness Summary section of the ROD for this Site. The ROD is the document that formalizes the selection of the remedy for a site.

PREFERRED REMEDY

Alternative S3 (Soil Vapor Extraction/Dual Phase Extraction/*In-Situ* Treatment) is the preferred alternative for the soil source areas. Under this alternative, the soil source areas would be targeted with soil vapor extraction in the vadose zone in combination with DPE in the shallow saprolite zone, followed by *in-situ* treatment. For this alternative, a pilot study would be performed as part of the PDI to collect the design parameters for the SVE and DPE system. For the design of a vapor extraction system, an air permeability test would be conducted to determine the site-specific design parameters, such the achievable air flow rate, the required vacuum to induce the flow, the radius of influence from the applied vacuum, and the initial contaminant removal rates.

The two buildings and the paved driveways at the Wallace lot would act as caps for the SVE system to prevent short-circuiting from the atmosphere. Additional impermeable cover may be installed as necessary for the implementation of SVE. Any additional cover would be engineered to limit infiltration of rainwater into the contaminated soils, meaning that durable, low-permeability material would be used, and rainwater would be directed away from the remediation zone. (For cost-estimating purposes, it is assumed no additional cap is needed.)

For cost-estimating purposes, it is assumed that 3, 13, and 8 SVE wells would be installed in SA-1, SA-2, and SA-3, respectively. Nested vapor

monitoring wells also would be installed to monitor the progress of contaminant removal and the changes in soil vapor pressure. Also, for cost-estimating purposes, it is assumed that the SVE system would be operated continuously for the first two years and intermittently for the following eight years. The implementation of SVE remedy could be performed simultaneously with the DPE, or the DPE could be operated six months to one year after the start of the SVE system, depending on the level of initial contaminant concentrations and any other logistical considerations.

The DPE system would be installed at SA-2 and SA-5 to reduce the contaminant mass in the shallow saprolite zone prior to other *in-situ* treatment. DPE wells would be installed based on the conclusions of the remedial design. For cost-estimating purposes, it is assumed 13 and 4 DPE wells will be installed in SA-2 and SA-5, respectively.

The water treatment system would be installed in the same building that would house the vapor treatment system. This system is anticipated to consist of groundwater extraction pumps, piping, transfer pumps, bag filters, and an air stripper in addition to the air-water separator and vapor phase activated carbon. Treated water would be discharged to the nearby open drainage ditch with an appropriate permit. Discharged water would meet Puerto Rico discharge permit requirements. In addition, for cost-estimating purposes, the DPE system is anticipated to be operated for one year.

BASIS FOR REMEDY PREFERENCE

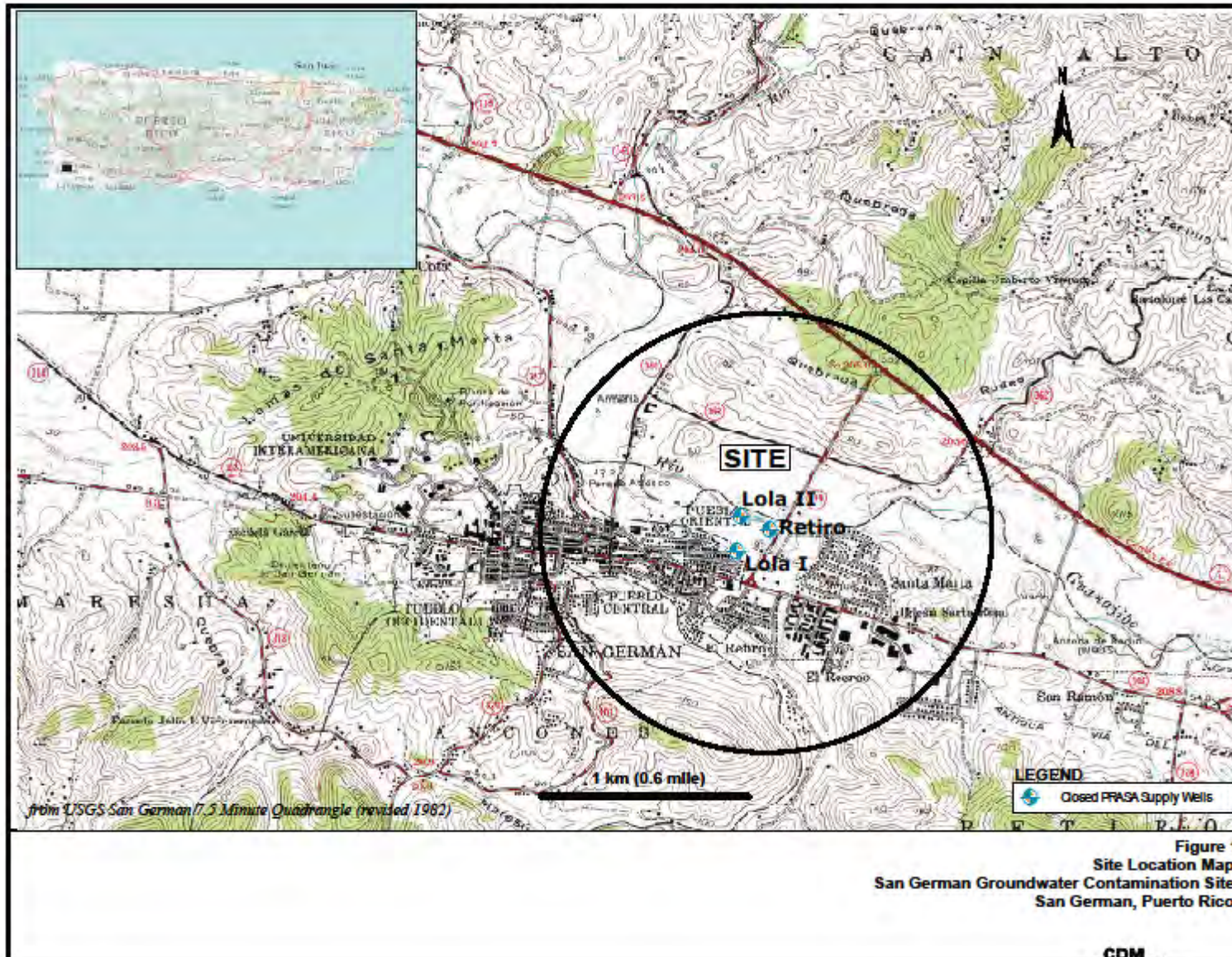
The Preferred Alternative is believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA and PREQB believe that the preferred remedy would treat principal threats, be protective of human health and the environment, comply with ARARs, be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred remedy also would

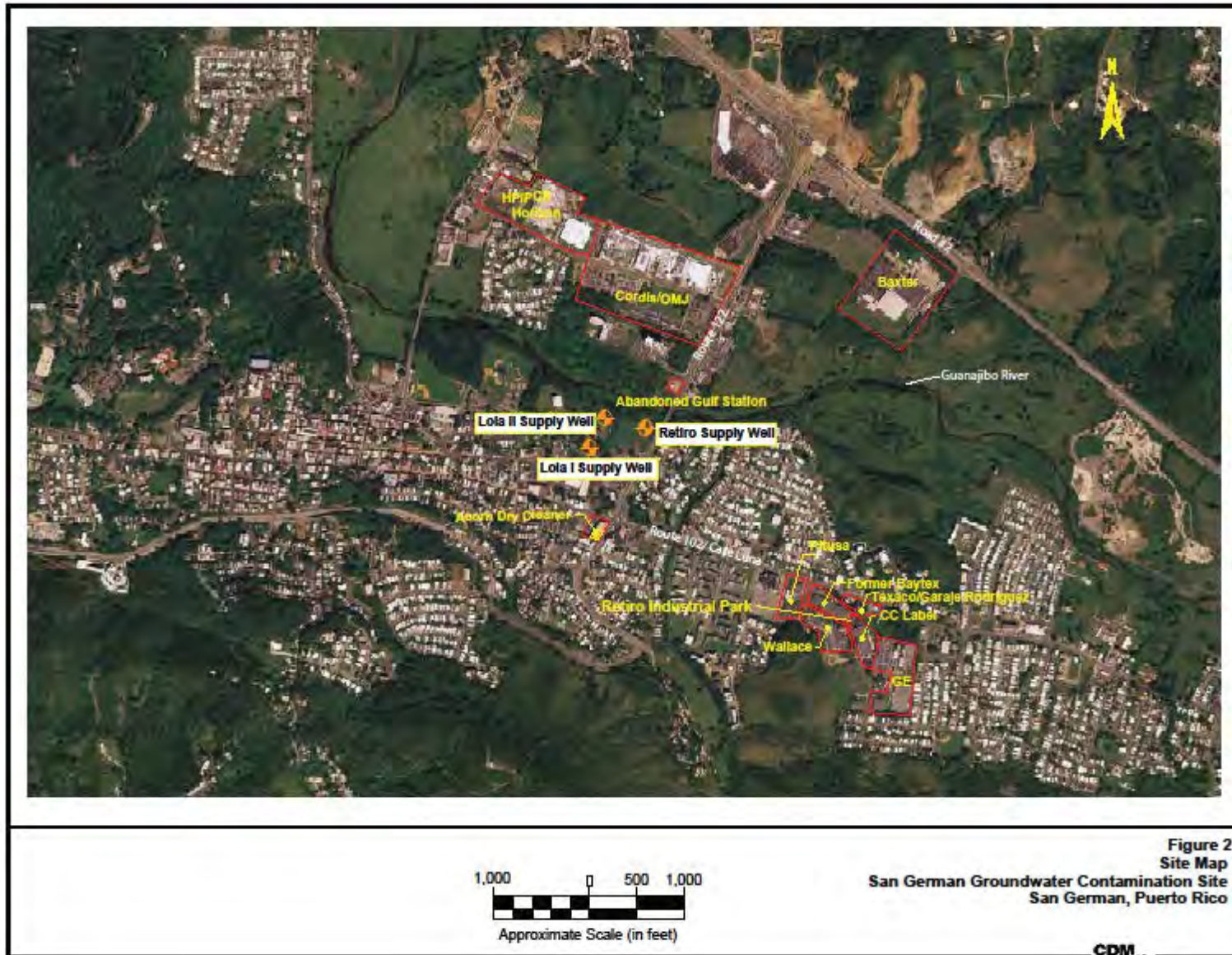
meet the statutory preference for the use of treatment as a principal element. The preferred alternative can change in response to public comment or new information.

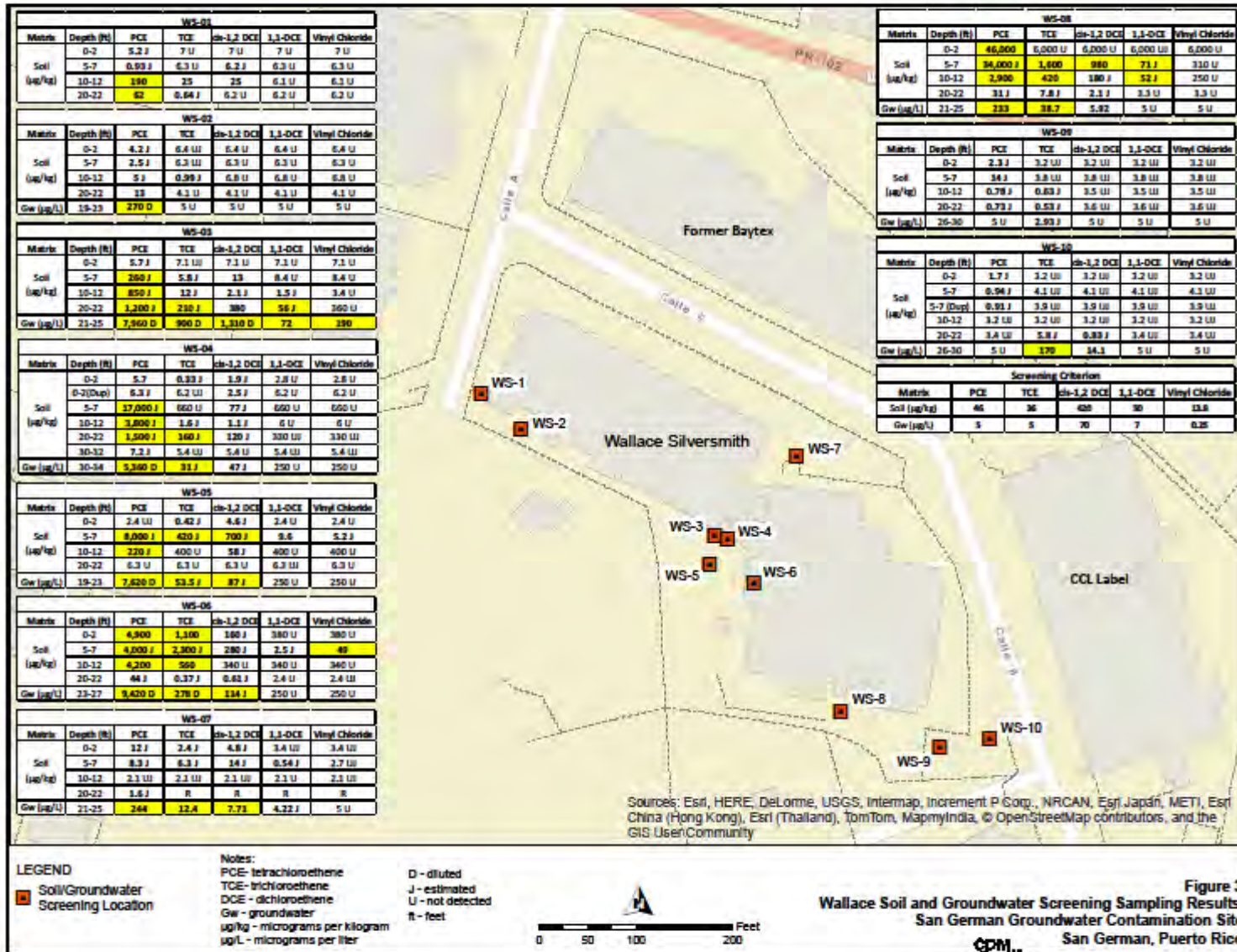
While the three active alternatives can achieve similar levels of protectiveness and Alternatives S2 and S4 appear capable of achieving the RAOs in a shorter time period (2.5 years as opposed to 10 years), the short-term occupant disruptions and implementability challenges are substantially greater than for Alternative S3. Alternative S3 also does not have the off-site disposal challenges of Alternative S2, and is substantially less expensive.

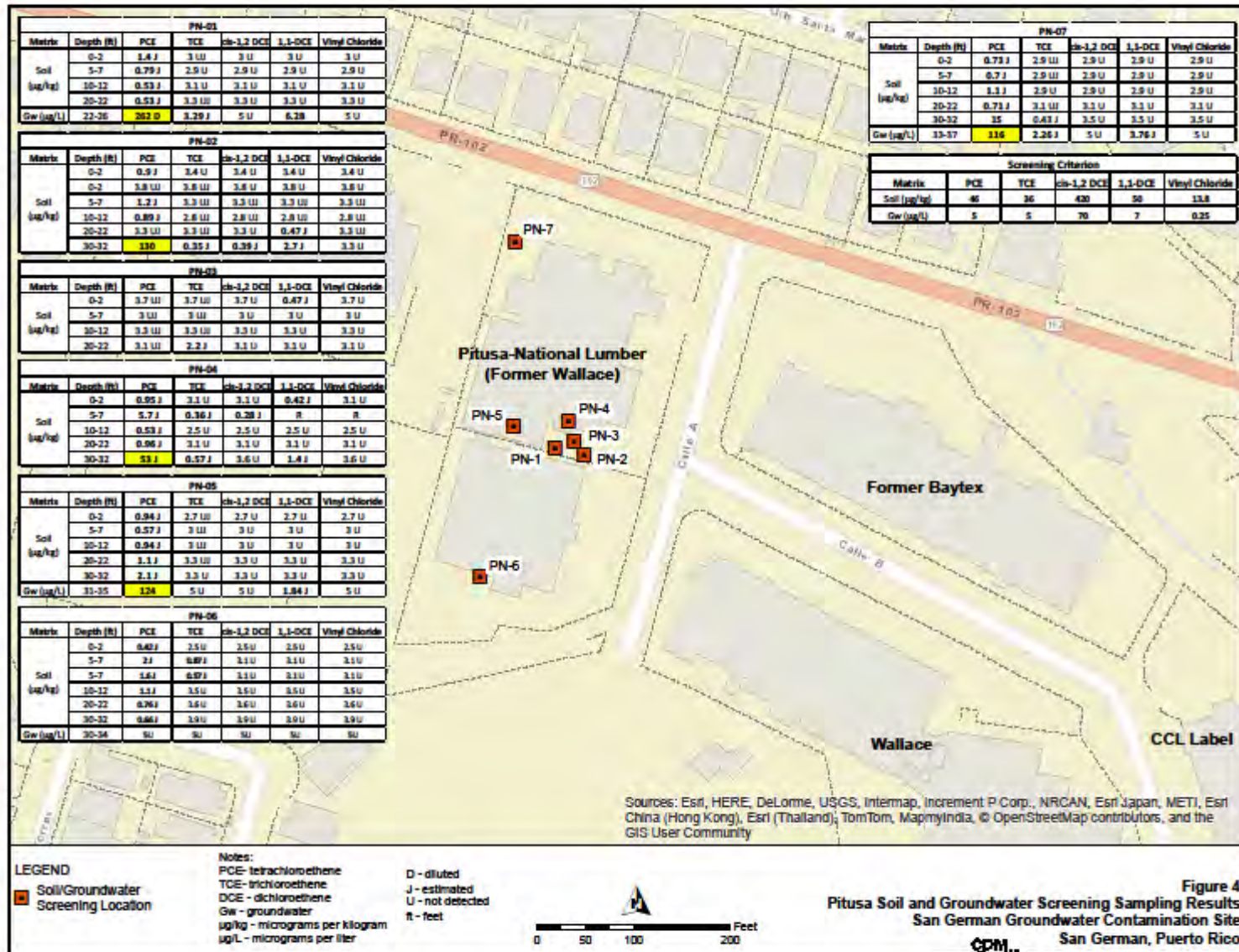
The environmental benefits of the preferred remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy. This would include consideration of green remediation technologies and practices.

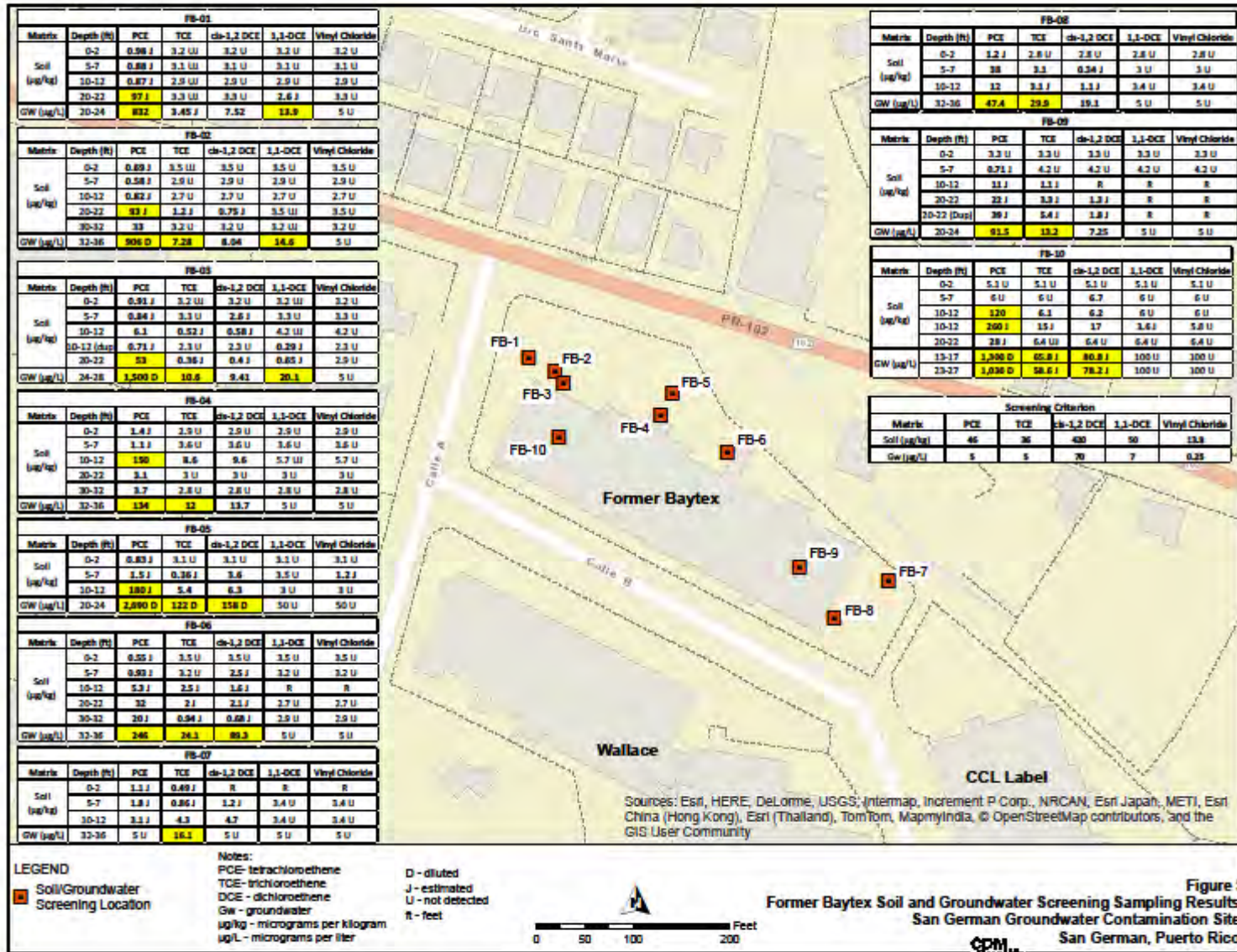
Table 5				
Preliminary Remediation Goals for Soil (all concentrations in µg/kg)				
Contaminants of Concern	CAS Number	Soil Protective of Groundwater	PRGs	Maximum Detected Concentrations
cis-1,2-Dichloroethene	156-59-2	204	204	4,400
Tetrachloroethene	27-18-4	101	101	46,000
Trichloroethene	79-01-6	36	36	3,600
Vinyl chloride	75-01-4	2	2	520J
1,1-Dichloroethene	75-35-4	35	35	84

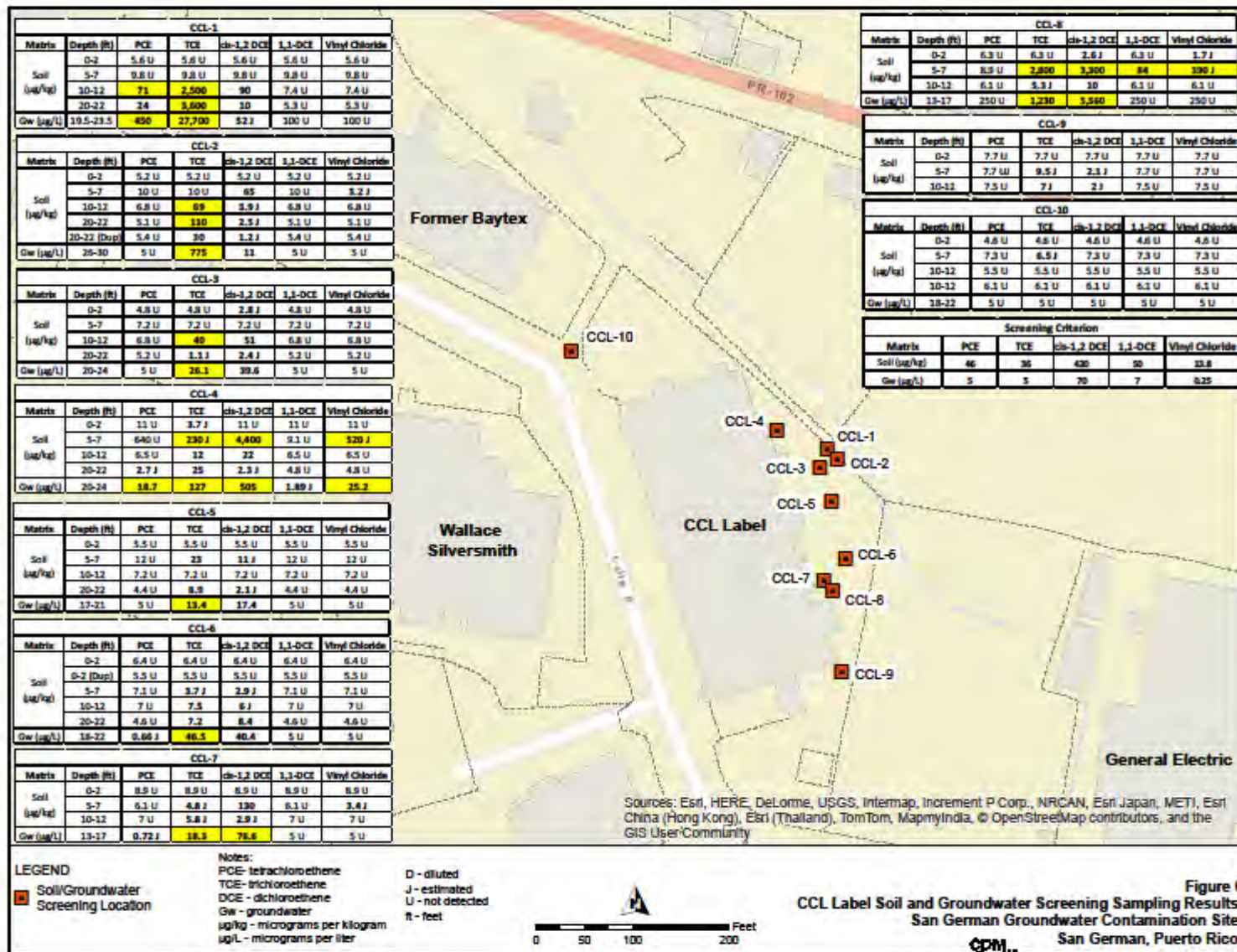


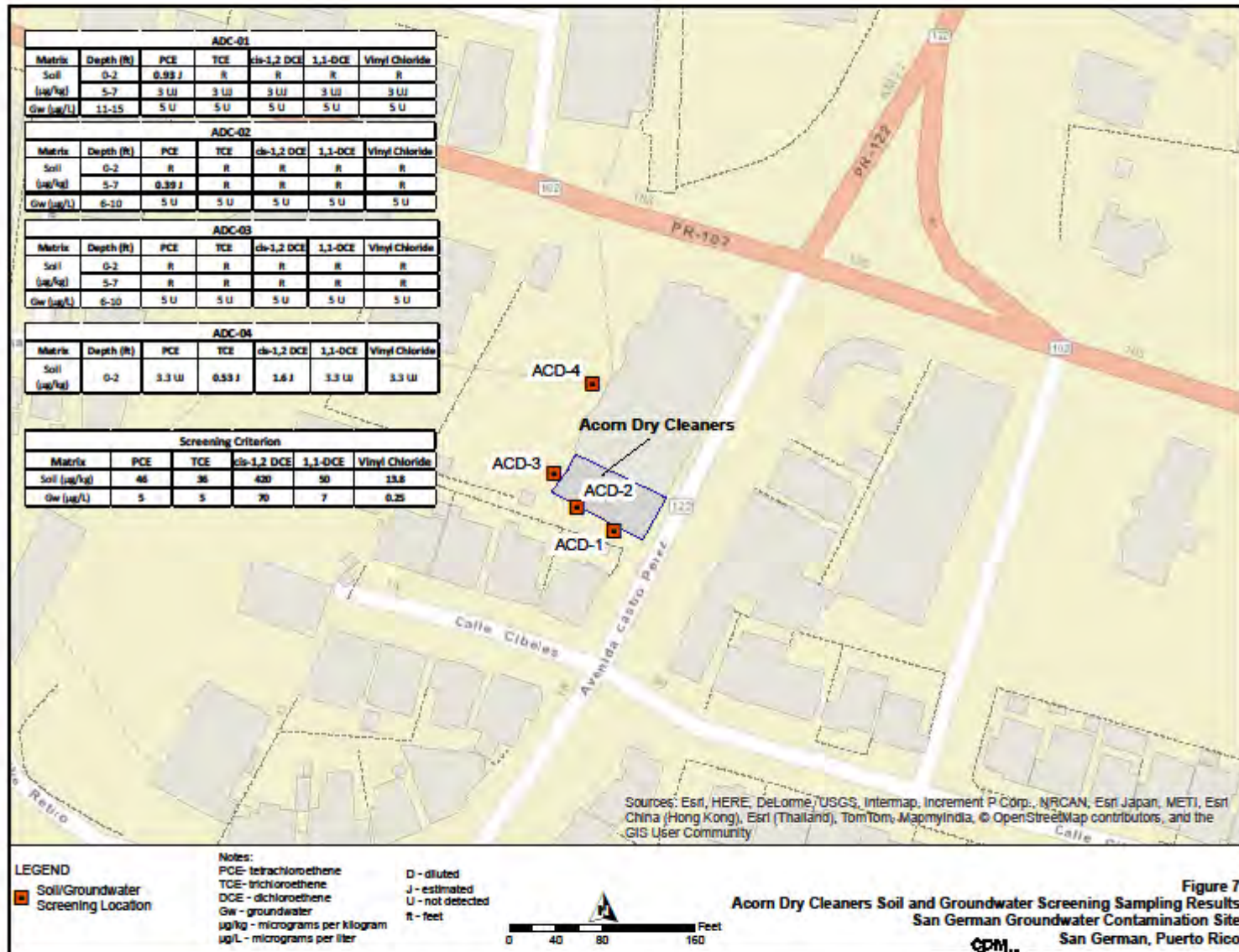


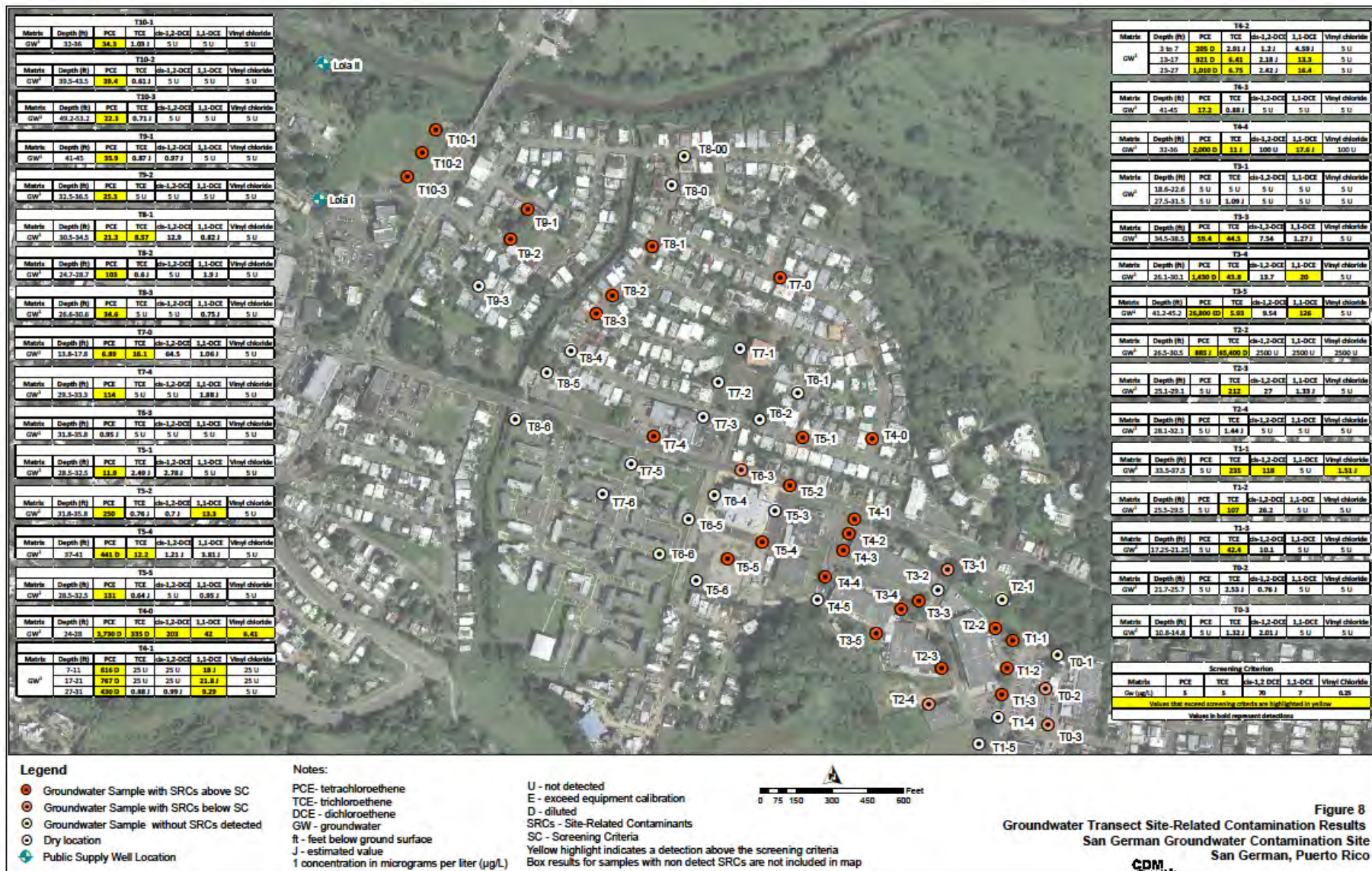












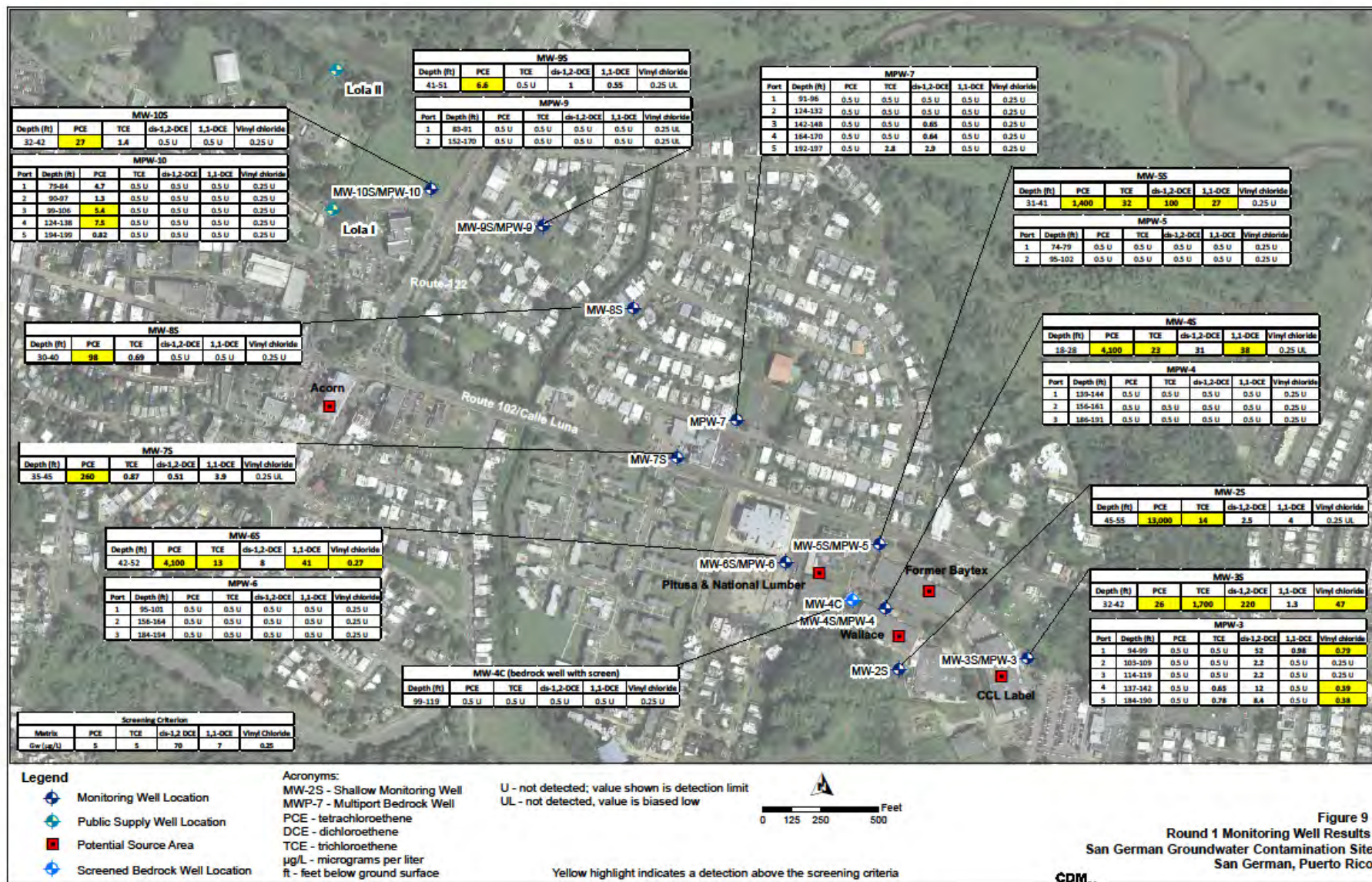
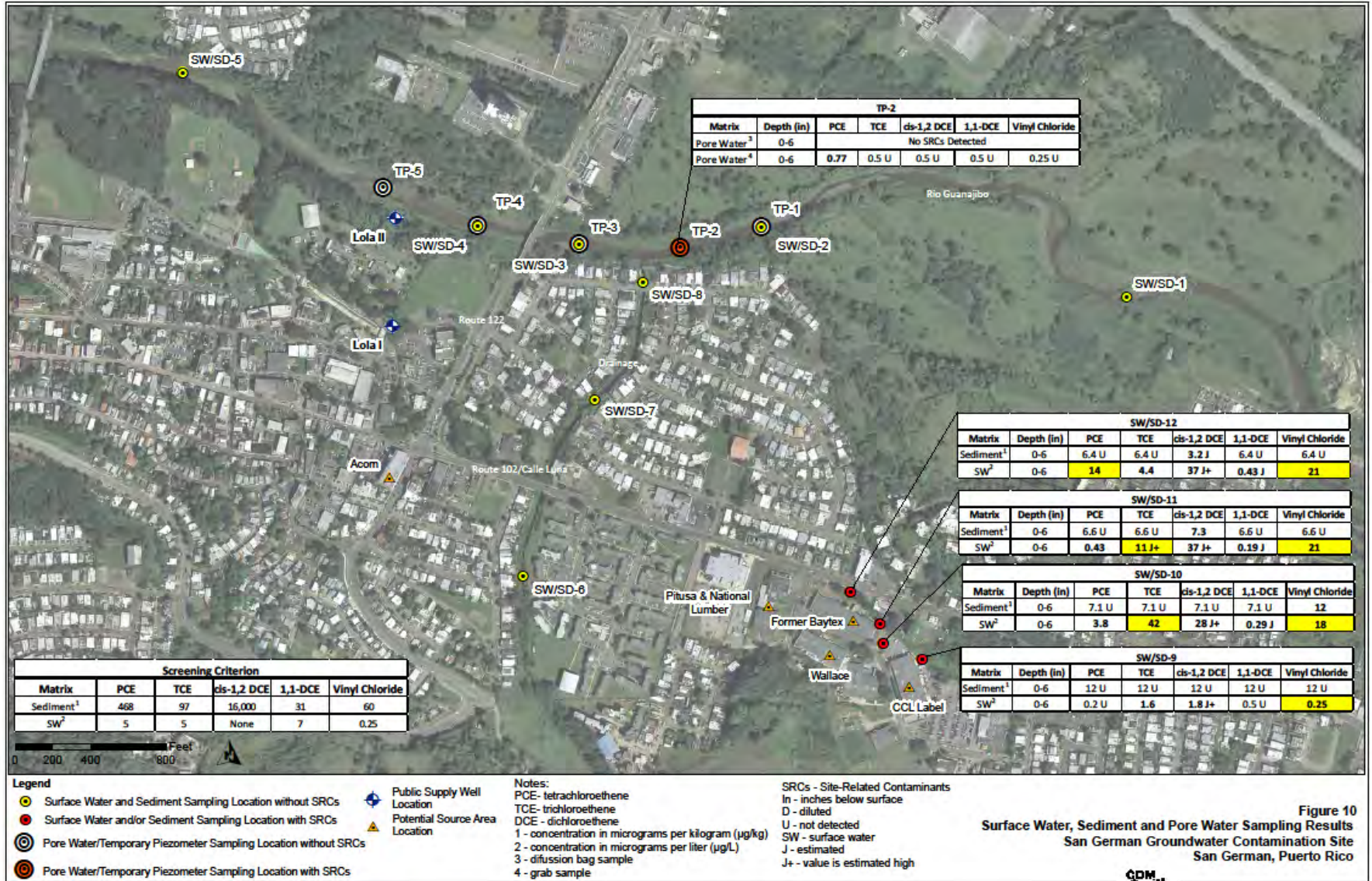
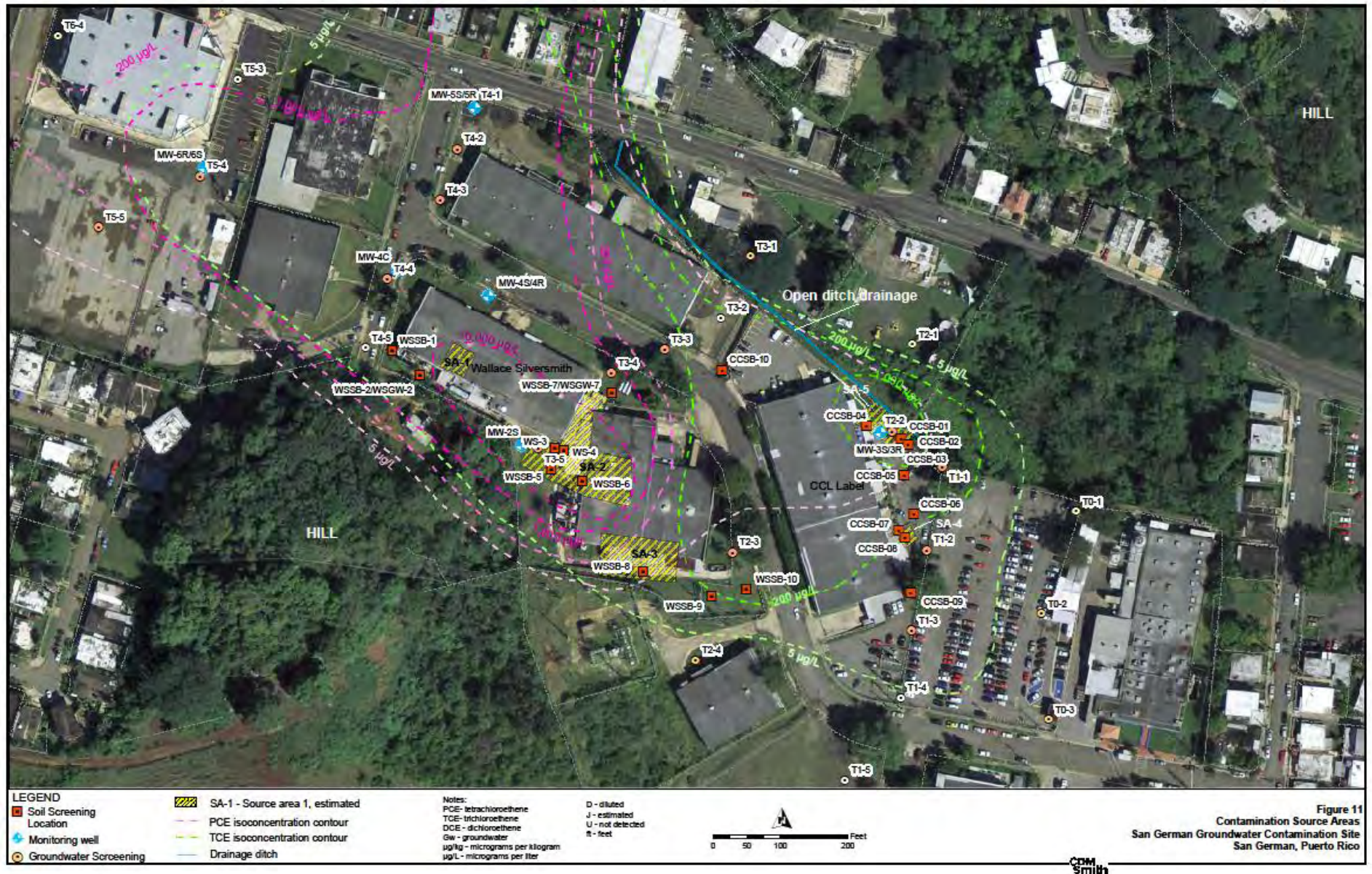


Figure 9
 Round 1 Monitoring Well Results
 San German Groundwater Contamination Site
 San German, Puerto Rico





APPENDIX II
ADMINISTRATIVE RECORD INDEX
San German Groundwater Contamination Superfund Site
OU-1

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL
08/13/2015

REGION ID: 02

Site Name: SAN GERMAN GROUND WATER
CONTAMINATION
CERCLIS ID: PRN000205957
OUID: 01
SSID: 02YP
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name:	Addressee Organization:	Author Name:	Author Organization:
319527	08/13/2015	ADMINISTRATIVE RECORD INDEX OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	3	[INDEX]				[US ENVIRONMENTAL PROTECTION AGENCY]
241415	07/27/2006	RCRA INSPECTION REPORT: WALLACE SILVERSMITHS, PARENT COMPANY SYRATECH CORPORATION FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	20	[REPORT]	[]	[]	[,]	[US ENVIRONMENTAL PROTECTION AGENCY]
202861	10/01/2006	HAZARD RANKING SYSTEM DOCUMENTATION PACKAGE FOR THE SAN GERMAN GROUNDWATER CONTAMINATION SITE VOLUME 1 OF 2	988	[REPORT]	[,]	[US ENVIRONMENTAL PROTECTION AGENCY]	[,]	[WESTON SOLUTIONS]
202862	10/01/2006	HAZARD RANKING SYSTEM DOCUMENTATION PACKAGE FOR THE SAN GERMAN GROUNDWATER CONTAMINATION SITE VOLUME 2 OF 2	472	[REPORT]	[,]	[US ENVIRONMENTAL PROTECTION AGENCY]	[,]	[WESTON SOLUTIONS, INCORPORATED]
241414	04/12/2007	NOTICES OF VIOLATION RCRA 3007 INFORMATION REQUEST FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	20	[LETTER]	[SANTIAGO, LUIS]	[WALLACE SILVERSMITHS]	[MEYER, GEORGE C]	[US ENVIRONMENTAL PROTECTION AGENCY]
306947	05/29/2008	US EPA GENERAL NOTICE OF POTENTIAL LIABILITY AND REQUEST FOR INFORMATION FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	10	[LETTER]	[FITZGERALD , DAVID , SANTIAGO, LUIS , SIEGEL , JEFFREY]	[LIFETIME BRANDS INCORPORATED, SYRATECH CORPORATION, WALLACE SILVERSMITHS]	[BASSO, RAYMOND]	[US ENVIRONMENTAL PROTECTION AGENCY]
306948	06/18/2008	LIFETIME BRANDS' RESPONSE TO THE US EPA GENERAL NOTICE OF POTENTIAL LIABILITY AND REQUEST FOR INFORMATION FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	16	[LETTER]	[KOLENBERG, BEVERLY , O'NEIL, CARLOS]	[US ENVIRONMENTAL PROTECTION AGENCY]	[SHINDEL , SARA]	[LIFETIME BRANDS INCORPORATED]

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL
08/13/2015

REGION ID: 02

Site Name: SAN GERMAN GROUND WATER
CONTAMINATION
CERCLIS ID: PRN000205957
OUID: 01
SSID: 02YP
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name:	Addressee Organization:	Author Name:	Author Organization:
241412	03/09/2009	CORRESPONDENCE REGARDING COMPLIANCE REPORT DOCKET NO. RCRA-02-2008-7109 IN THE MATTER OF WALLACE SILVERSMITHS DE PUERTO RICO, LIMITED (WITH ENCLOSURES) FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	623	[LETTER]	[PLOSSL, CARL]	[US ENVIRONMENTAL PROTECTION AGENCY]	[FITZGERALD, DAVID]	[LIFETIME BRANDS INCORPORATED]
241408	05/19/2010	FINAL WORK PLAN VOLUME 1 FOR THE REMEDIAL INVESTIGATION / FEASIBILITY STUDY FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	174	[PLAN]	[.]	[US ENVIRONMENTAL PROTECTION AGENCY]	[.]	[CDM FEDERAL PROGRAMS CORPORATION]
319515	08/23/2011	FINAL QUALITY ASSURANCE PROJECT PLAN FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	376	[REPORT]	[.]	[US ENVIRONMENTAL PROTECTION AGENCY]	[.]	[CDM FEDERAL PROGRAMS CORP]
308899	08/03/2012	PUBLIC HEALTH ASSESSMENT FOR EXPOSURE TO CHLORINATED VOCS IN MUNICIPAL DRINKING WATER SYSTEM FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	29	[REPORT]	[]	[]	[.]	[US DEPARTMENT OF HEALTH AND HUMAN SERVICES]
318397	05/19/2015	US EPA 104E REQUEST FOR INFORMATION SENT TO PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	12	[LETTER]	[MEDINA COMAS, ANTONIO L]	[PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY]	[DIFORTE, NICOLETTA]	[US ENVIRONMENTAL PROTECTION AGENCY]
319524	05/22/2015	PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY'S RESPONSE TO US EPA 104E RESPONSE FOR INFORMATION FOR THE SAN GERMAN WATER CONTAMINATION SITE	17	[LETTER]	[GUZMAN, HENRY]	[US ENVIRONMENTAL PROTECTION AGENCY]	[BALSA , ANA]	[PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY]
319525	06/03/2015	WALLACE SILVERSMITHS DE PUERTO RICO, LIMITED RESPONSE TO PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY LETTER DATED 05/13/2015 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	4	[LETTER]	[BALSA , ANA]	[PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY]	[NIEVES-MIRANDA , PEDRO]	[WALLACE SILVERSMITHS DE PUERTO RICO, LIMITED]

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL
08/13/2015

REGION ID: 02

Site Name: SAN GERMAN GROUND WATER
CONTAMINATION
CERCLIS ID: PRN000205957
OUID: 01
SSID: 02YP
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name:	Addressee Organization:	Author Name:	Author Organization:
319523	06/19/2015	CORRESPONDENCE REGARDING WALLACE SILVERSMITHS DE PUERTO RICO, LIMITED VOLUNTARILY STEP FORWARD TO COORDINATE AND WORK WITH US EPA FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	2	[LETTER]	[SPIESMAN, THOMAS]	[PORZIO BROMBERG & NEWMAN]	[GUZMAN, HENRY]	[US ENVIRONMENTAL PROTECTION AGENCY]
350338	07/14/2015	PROPOSED PLAN CONCURRENCE LETTER FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	1	[LETTER]	[BOSQUE, ADALBERTO]	[US ENVIRONMENTAL PROTECTION AGENCY]	[, PEEBLES, JUAN]	[OFFICE OF THE GOVERNOR OF PUERTO RICO, PUERTO RICO ENVIRONMENTAL QUALITY BOARD]
350378	07/22/2015	REVISED FINAL SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT REPORT FOR OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	80	[REPORT]	[]	[]	[,]	[CDM SMITH]
350380	07/22/2015	FINAL FEASIBILITY STUDY REPORT FOR OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	193	[REPORT]	[]	[]	[,]	[CDM SMITH]
350388	07/23/2015	FINAL HUMAN HEALTH RISK ASSESSMENT FOR OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	775	[REPORT]	[]	[]	[,]	[CDM SMITH]
350390	07/24/2015	FINAL REMEDIAL INVESTIGATION REPORT FOR OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	1288	[REPORT]	[]	[]	[,]	[CDM SMITH]
319528	08/11/2015	PROPOSED PLAN FOR OU1 FOR THE SAN GERMAN GROUND WATER CONTAMINATION SITE	39	[PLAN]	[]	[]	[,]	[US ENVIRONMENTAL PROTECTION AGENCY]

**APPENDIX III
PUBLIC NOTICE**

**San German Groundwater Contamination Superfund Site
OU-1**



**La Agencia Federal de Protección Ambiental
Anuncia el Plan Propuesto y Periodo de Comentarios
Para el Lugar de Superfondo Contaminación de Agua
Subterránea de San Germán
San Germán, Puerto Rico**

La Agencia Federal de Protección Ambiental (EPA por sus siglas en inglés) en colaboración con la Junta de Calidad Ambiental, anuncia el comienzo de un período de treinta (30) días de comentario público sobre el Plan Propuesto para la remediación del lugar conocido como Contaminación de Agua Subterránea de San Germán, localizado en el municipio de San Germán, Puerto Rico. El Plan Propuesto describe las alternativas recomendadas y las razones para estas recomendaciones. Antes de seleccionar un remedio final, la EPA va a considerar los comentarios escritos y verbales recibidos durante este periodo de comentario público. Todos los comentarios (verbales y/o escritos) deberán ser recibidos en o antes del 11 de Septiembre de 2015. La EPA proveerá un resumen de todos los comentarios y sus respuestas en el Récord de Decisión para este lugar.

La EPA llevará a cabo una reunión pública el miércoles 19 de agosto de 2015, de 6:00 pm a 8:00 pm en la Cancha de la Urbanización Santa Marta, San Germán, Puerto Rico. El propósito de esta reunión es informarle a la comunidad sobre los hallazgos, conclusiones y recomendaciones de la investigación remedial realizada en el lugar. Además, se discutirá la alternativa de remediación recomendada. Durante esta reunión pública, la EPA contestará preguntas o comentarios que los participantes tengan con relación a la investigación realizada y sobre la alternativa de limpieza recomendada.

Copias del Plan Propuesto y otros documentos relacionados al lugar están disponibles en los siguientes repositorios de información:

Nueva Alcaldía de San Germán
Calle Luna
San Germán, Puerto Rico 00683
(787) 892-3500

Horario: Lunes – Viernes 8:00am a 4:00 pm

Junta de Calidad Ambiental de Puerto Rico
Programa de Respuestas de Emergencias y
Superfondo

Edificio de Agencias Ambientales Cruz A. Matos
Urbanización San José Industrial Park
1375 Avenida Ponce de León
San Juan, PR 00926-2604
(787)767-8181 ext 3207

Horario: Lunes – Viernes 9:00am a 3:00 pm
Por cita

Agencia Federal de Protección Ambiental,
Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000

48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104 (787) 977-5869
Horario: Lunes.- Viernes, 9:00 a.m. a 4:30 p.m.
Por cita

U.S. Environmental Protection Agency,
Region 2
290 Broadway, 18th floor
New York, New York 10007-1866
(212) 637-4308
Horario: Lunes.-Viernes, 9:00 a.m. a 3:30 p.m.
Por cita

Para más información, favor llamar a Adalberto Bosque PhD, MBA al (787) 977-5825. Comentarios escritos al Plan Propuesto deben ser enviados a:

Adalberto Bosque PhD, MBA
Gerente de Proyectos
Agencia Federal de Protección Ambiental, Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104
Internet: bosque.adalberto@epa.gov



AVISO PÚBLICO

**LA AGENCIA FEDERAL DE PROTECCION AMIENTAL
ANUNCIA EL PLAN PROPUESTO Y PERIODO DE COMENTARIOS
PARA EL LUGAR DE SUPERFONDO
ALMACEN DE PESTICIDAS III DE MANATI
MANATI, PUERTO RICO**

La Agencia Federal de Protección Ambiental (EPA por sus siglas en inglés) en colaboración con la Junta de Calidad Ambiental, anuncia el comienzo de un período de treinta (30) días de comentario público sobre el Plan Propuesto para la remediación del lugar conocido como Almacén de Pesticidas III, localizado en el sector Palo Alto en el municipio de Manatí, Puerto Rico. El Plan Propuesto describe las alternativas recomendadas y las razones para estas recomendaciones. Antes de seleccionar un remedio final, la EPA va a considerar los comentarios escritos y verbales recibidos durante este periodo de comentario público. Todos los comentarios (verbales y/o escritos) deberán ser recibidos en o antes del 11 de Septiembre de 2015. La EPA proveerá un resumen de todos los comentarios y sus respuestas en el Récord de Decisión para este lugar.

La EPA llevará a cabo una reunión pública el martes 18 de agosto del 2015, de 6:00 pm a 9:00 pm en el salón de conferencias de la Alcaldía de Manatí, Puerto Rico. El propósito de esta reunión es informarle a la comunidad sobre los hallazgos, conclusiones y recomendaciones de la investigación remedial realizada en el lugar. Además, se discutirá la alternativa de remediación recomendada. Durante esta reunión pública, la EPA contestará preguntas o comentarios que los participantes tengan con relación a la investigación realizada y sobre la alternativa de limpieza recomendada.

Copias del Plan Propuesto y otros documentos relacionados al lugar están disponibles en los siguientes repositorios de información:

Biblioteca Municipal
Paseo de las Atenas y Calle Mackinley
Manatí, Puerto Rico 00739
(787) 884-5494

Horario: Lunes – Viernes 7:00am a 11:00 pm

Junta de Calidad Ambiental de Puerto Rico
Programa de Respuestas de Emergencias y
Superfondo

Edificio de Agencias Ambientales Cruz A. Matos
Urbanización San José Industrial Park
1375 Avenida Ponce de León
San Juan, PR 00926-2604
(787)767-8181 ext 3207

Horario: Lunes – Viernes 9:00am a 3:00 pm
Por cita

Agencia Federal de Protección Ambiental,
Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000

48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104 (787) 977-5869
Horario: Lunes.- Viernes, 9:00 a.m. a 4:30 p.m.
Por cita

U.S. Environmental Protection Agency, Region 2
290 Broadway, 18th floor
New York, New York 10007-1866
(212) 637-4308

Horario: Lunes.-Viernes, 9:00 a.m. a 3:30 p.m.
Por cita

Para más información, favor llamar al señor Luis E. Santos al (787) 977-5865. Comentarios escritos al Plan Propuesto deben ser enviados a:

Luis E. Santos
Gerente de Proyectos
Agencia Federal de Protección Ambiental, Región 2
División de Protección Ambiental del Caribe
City View Plaza II- Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069
Fax: (787) 289-7104
Email: santos.luis@epa.gov

APPENDIX IV
FACT SHEET (IN SPANISH)
San German Groundwater Contamination Superfund Site
OU-1

Programa Superfondo – Hoja Informativa



San German Superfund Site

San German, Puerto Rico

Agosto del 2015

EPA Region 2



CONTAMINACIÓN DEL AGUA SUBTERRANEA DE SAN GERMAN UNIDAD OPERACIONAL 1

San Germán, Puerto Rico

Agosto del 2015

PARA OBTENER MÁS INFORMACIÓN

Participación de la Comunidad

La participación del público es esencial para el éxito del Programa de Superfondo de la EPA. Si usted tiene alguna pregunta acerca de las actividades sobre el Lugar de Superfondo de San Germán puede llamar a:

Dr. Adalberto Bosque Gerente de Proyecto Remediación de EPA al (787) 977-5825, bosque.adalberto@EPA.gov, o con la Sra. Brenda Reyes, Coordinadora de Participación de la Comunidad de la EPA al (787) 977-5869, reyes.brenda@epa.gov.

Superfondo

Para obtener información sobre el proceso de Superfondo, visite el sitio web de la EPA en www.epa.gov/superfund.

Repositorio de información

El repositorio de información contiene documentos relacionados con el Lugar, disponibles para la revisión del público en las siguientes ubicaciones:

Nueva Alcaldía de San Germán

Calle Luna
San Germán, Puerto Rico 00683
(787) 892-3500
Horario: Lunes – Viernes 8:00am a 4:00 pm

USEPA Región II

Centro de Expedientes del Superfondo
290 Broadway, piso 18
Nueva York, NY 10007-1866
Lunes a viernes de 9:00 AM a 5:00 PM
(212) 637-4308

Agencia Federal de Protección Ambiental, Región 2
División de Protección Ambiental del Caribe
City View Plaza II, Suite 7000
#48 PR-165 km 1.2
Guaynabo, Puerto Rico 00968-8069
Lunes a viernes de 9:00 AM a 4:30 PM
Brenda Reyes, (787) 977-5869

Reunión Pública

Cancha de la Urbanización Santa Marta
San Germán, Puerto Rico 00683
Fecha: 19 de agosto de 2015
Hora: 6:00 PM

LA EPA PROPONE REMEDIO PARA LA UNIDAD OPERACIONAL 1 DEL LUGAR DE CONTAMINACION DE AGUA SUBTERRANEA DE SAN GERMÁN

HISTORIA Y ANTECEDENTES DEL LUGAR

El Lugar de Contaminación de Agua Subterránea de San Germán (el Lugar) está ubicado en San Germán, Puerto Rico. Muestras tomadas de pozos de abastecimiento público detectaron la presencia de compuestos orgánicos volátiles (VOC, por sus siglas en inglés) en tres pozos de agua de abastecimiento público localizados en San Germán. Estos pozos eran y operaban para la Autoridad de Acueductos y Alcantarillados de Puerto Rico (AAA). Estos fueron los pozos Retiro, Lola Rodríguez de Tío (Lola I) y Lola Rodríguez de Tío II (Lola II), ubicados al sur del Río Guanajibo, entre las carreteras 139 y 360. Estos pozos eran parte del sistema de agua de AAA conocido como San Germán Urbano. Los tres pozos fueron puestos fuera de servicio en el 2006.

Entre el 2001 y el 2005, las muestras de agua subterránea tomadas trimestralmente en los pozos Retiro, Lola I y II Lola resultaron con concentraciones detectables de tetracloroetano (PCE, por sus siglas en inglés) y cis-1, 2-dicloroetano (cis-1, 2-DCE). Las concentraciones máximas de PCE y cis-1, 2-DCE fueron de 6.4 microgramos por litro (µg/L) y 1.2 µg/L, respectivamente.

En junio del 2006, la EPA recopiló y analizó muestras de agua subterránea en pozos activos en el área para una variedad de contaminantes. Los resultados confirmaron la

presencia del PCE (1.6 µg/L), cis-1, 2-DCE (1.5 µg/L) y tricloroetileno (TCE) (0.54 µg/L). En julio del 2006 y enero del 2007, la EPA realizó actividades de reconocimiento en varios lugares industriales en el área de San Germán para identificar fuentes potenciales de la contaminación del agua subterránea en los pozos de suministro.

La EPA añadió el Lugar de Contaminación de Agua Subterránea de San Germán a la Lista de Prioridades Nacionales (NPL, por sus siglas inglés) el 19 de marzo del 2008 por la presencia de disolventes clorados en el agua subterránea que abastece el agua potable para los residentes del área. En el año 2015, la EPA divide el Lugar en dos unidades operacionales (OUs). El OU-1 incluye suelos contaminados en áreas identificadas como fuente y el OU-2 incluye la investigación de agua subterránea. Esta hoja informativa tiene pertinencia a la fase OU-1.

INVESTIGACIÓN DE REMEDIACIÓN

La EPA ha llevado a cabo una investigación de remediación en el Lugar para evaluar el suelo y el agua subterránea. Para identificar las fuentes de la contaminación observada en los pozos de suministro, para esto se tomaron muestras de suelo en cinco áreas identificadas como fuentes potenciales. Se realizaron un total de 41 perforaciones y se tomaron 159 muestras de suelo. Se han identificado dos propiedades como fuentes de contaminación en el Parque Industrial el Retiro. Las dos propiedades están actualmente ocupadas por Wallace Silversmiths de Puerto Rico, Ltd. (Wallace), and CCL Insertco de PR (CCL). En estas dos propiedades se detectaron los mismos contaminantes encontrados en el agua subterránea.

La EPA también llevó a cabo una investigación del agua subterránea para determinar la magnitud y alcance de la contaminación, incluyendo un muestreo inicial del agua subterránea entre las áreas de la fuente en el parque industrial y los pozos de suministro impactados. Los resultados iniciales del muestreo de proporcionaron inicialmente la delineación de la extensión de la contaminación en el agua subterránea. Posteriormente, la EPA instaló 17 pozos de muestreo dentro de esta zona para evaluar la contaminación del agua subterránea.

La EPA recogió dos rondas de muestras de agua subterránea de los pozos de muestreo,

incluyendo varios pozos residenciales privados en la zona (Ronda 2).

Muestras de agua superficial y sedimento fueron tomadas de alcantarillas pluviales en el Parque Industrial el Retiro y en el Río Guanajibo para determinar si habían sido impactada por la contaminación del agua subterránea. En marzo del 2013 y enero del 2014, la EPA tomo dos rondas de muestras de vapor de suelo en los edificios del Parque Industrial del Retiro y en un número de propiedades residenciales ubicadas al noroeste del Parque Industrial el Retiro. El propósito de este muestreo de vapor de suelo fue determinar si la intrusión del vapor de los contaminantes en el aire interior sería una preocupación para el área.

RESULTADOS DE LA INVESTIGACIÓN DE REMEDIACIÓN

Los resultados de la investigación del suelo indican que dos propiedades en el Parque Industrial el Retiro tienen concentraciones altas de contaminación en el suelo con los mismos productos químicos que han sido identificados en el agua subterránea. Estas áreas de contaminación de suelo causaron la contaminación del agua subterránea y comprenden el OU-1 del Lugar.

Los mismos productos químicos también fueron detectados en muestras de agua superficial en el Parque Industrial. VOCs relacionados al Lugar no fueron detectados en muestras de agua superficial en el río Guanajibo. Contaminantes relacionados al Lugar fueron detectados en muestras de sedimentos en el drenaje del Parque Industrial pero no en el río Guanajibo.

La investigación de remediación indica la presencia de la contaminación del agua subterránea entre el Parque Industrial el Retiro y los pozos de suministro cerrados de AAA. Las concentraciones de los contaminantes en sobrepasaron el nivel máximo del contaminante (MCL, por sus siglas en inglés), el nivel máximo de contaminantes permitidos para fines de agua potable. La contaminación del agua subterránea se evaluará más adelante bajo el OU-2.

Los resultados de vapor de suelo demostraron que VOCs se han acumulado bajo los cimientos de algunos edificios en el Parque Industrial del Retiro, aunque las concentraciones de VOCs dentro de esos edificios no excedieron los límites de acción establecidos por la EPA. Los resultados de vapor de suelo en las residencias

muestreadas presentaron concentraciones de VOCs por debajo de los límites de acción.

RESULTADOS DE LA EVALUACIÓN DE RIESGO

Evaluación Base de Riesgos a Salud Humana

Se realizó una evaluación base de riesgos a la salud humana para estimar los riesgos y peligros asociados con los efectos presentes y futuros de los contaminantes en la salud humana en ausencia de cualquier acción para controlar o mitigar la contaminación bajo los usos del suelo presentes y futuros.

La evaluación de riesgos a la salud humana comenzó con la selección de los productos químicos de interés potencial (COPCs, por sus siglas en inglés) en los diferentes medios (es decir, suelo, agua subterránea, agua superficial y sedimento) que potencialmente pueden causar efectos adversos a la salud en poblaciones expuestas. Los escenarios de uso presente y futuro del terreno incluyen las siguientes vías de exposición y las poblaciones de:

- Trabajador en el Lugar (adulto): ingestión al presente, contacto cutáneo y la inhalación de las partículas del suelo y los vapores de la superficie del suelo en las propiedades de Wallace y CCL y futura ingestión, contacto cutáneo y la inhalación de las partículas del suelo y los vapores de la superficie del suelo en las propiedades de Wallace, CCL, Acorn Dry Cleaners, Former Baytex y Pitusa-Ferretería Nacional.
- Residentes (niño/adulto): futura ingestión, contacto cutáneo y la inhalación de las partículas del suelo y los vapores de la superficie del suelo en las propiedades de Wallace, CCL, Acorn Dry Cleaners, Former Baytex y Pitusa-Ferretería Nacional.
- Recreacional (adolescentes 12-18): ingestión presente y futura, y contacto dérmico con las aguas superficiales y sedimentos en el río Guanajibo.
- Intrusos (adolescentes 12-18): ingestión al presente, contacto cutáneo y la inhalación de partículas de suelo y vapores para superficie suelo de Wallace, y propiedades CCL e ingestión futura, contacto cutáneo, inhalación de partículas y vapores de superficie de suelo en las propiedades de Wallace, CCL, Acorn Dry Cleaners, Former Baytex y Pitusa-Ferretería Nacional.

- Trabajadores de la construcción (adulto): futura ingestión, contacto cutáneo y la inhalación de vapores del suelo superficial y del subsuelo en Wallace, CCL, Acorn Dry Cleaners, Former Baytex y Pitusa-Ferretería Nacional.

Suelo: Los riesgos y peligros fueron evaluados para la exposición potencial futura de suelo superficial y subsuelo. La población de interés incluía obreros adultos en cada una de las cinco propiedades de interés. Los riesgos de cáncer estaban por debajo o dentro de los rangos aceptables de la EPA. Los riesgos no-cancerígenos en cada una de las propiedades estaban por encima del valor aceptable de 1 de la EPA. El COPC identificado para el suelo superficial/subsuelo fue vanadio. Vanadio no era considerado como un contaminante relacionado con el Lugar, y los riesgos y peligros pueden atribuirse al trasfondo. TCE y PCE fueron identificados en el subsuelo, y estos compuestos se han vinculado a las concentraciones elevadas en los vapores de suelos encontrados debajo de edificios y a concentraciones elevadas en el agua subterránea. Por lo tanto, TCE y PCE se han escogido como químicos de preocupación (COC, por sus siglas en inglés) en el suelo.

Agua subterránea: Los riesgos y peligros fueron evaluados para la exposición potencial futura al agua subterránea. Las poblaciones de interés incluyen trabajadores adultos del Lugar y residentes adultos y niños en cada una de las cinco propiedades de interés. Los riesgos para cáncer estaban por encima de los rangos aceptables de la EPA. Los riesgos no-cancerígenos para cada una de las propiedades estaban por encima del valor aceptable de 1 de la EPA. Los COC identificados en el agua subterránea eran TCE, PCE y cloruro de vinilo. El recurso de agua subterránea se abordará en un documento de decisión independiente bajo el OU-2.

Agua superficial y sedimento: los riesgos y peligros fueron evaluados para la exposición potencial futura de las aguas superficiales y sedimentos en el Río Guanajibo. La población de interés incluyó adolescentes en actividades recreacionales. Los riesgos de cáncer estaban por debajo o dentro de los rangos aceptables de la EPA. Los riesgos no-cancerígenos estaban por debajo o ligeramente por encima del valor aceptable de 1 de la EPA. La suma de los cocientes levemente excede el valor de 1 para sedimentos; sin embargo, no hay químicos individuales o productos químicos que actúan

sobre el mismo órgano por encima de un valor de 1. Por lo tanto, no existe COCs identificados para el agua superficial o sedimentos.

Vapor de Suelo: Se evaluó el potencial que vapores del agua subterránea contaminada se volatilizaran y penetraran dentro de edificios que se encuentran sobre el agua subterránea contaminada. Las concentraciones elevadas de vapores de suelos de TCE y PCE fueron detectadas en varios edificios (tres edificios comerciales y dos viviendas). Una de las propiedades residenciales también tenía una leve superación del aire interior al valor de detección para TCE. La vía de la intrusión de vapor de suelo continuará a ser evaluada y acciones correctivas apropiadas se tomarán basándose en los resultados de las muestras.

Evaluación de riesgo ecológico

Se realizó una evaluación de riesgo ecológico por detección (SLERA, por sus siglas en inglés) para evaluar el potencial de riesgo ecológico por la presencia de contaminantes en la superficie del suelo. El SLERA se centró en evaluar el potencial de impactos a los receptores ecológicos sensibles a los COC relacionados con el Lugar a través de la exposición a la superficie del suelo en las propiedades, agua superficial, sedimentos y agua de poro del Río Guanajibo.

Superficie del suelo: Existe el potencial para efectos adversos a los receptores ecológicos a la exposición a la superficie del suelo de metales (cromo, cobalto, cobre, plomo, manganeso, mercurio, níquel, selenio, plata, vanadio y zinc). Sin embargo, ninguno de los metales se consideran relacionados al Lugar; por lo tanto, ningún COC fue seleccionado para la superficie del suelo en cualquiera de las propiedades.

Agua superficial: Existe el potencial para efectos adversos a los receptores ecológicos por exposición a metales (aluminio, bario, cadmio, cromo, cobalto, cobre, hierro, plomo, manganeso, níquel, plata, vanadio y zinc) y tres compuestos orgánicos volátiles (cloroformo, tolueno y TCE). Los metales no se consideraron relacionados con el Lugar y no fueron seleccionados como COC. La elevada concentración de TCE fue situada en una zona de drenaje con limitado hábitat viable adyacente al Parque Industrial el Retiro. No se espera ningún efecto ecológico adverso y los COC no fueron identificados para aguas superficiales.

Sedimento: Existe potencial para efectos adversos a los receptores ecológicos por exposición a metales (antimonio, cadmio, cromo, cobalto, cobre, cianuro, hierro, plomo, manganeso, níquel, plata y zinc). Sin embargo, ninguno de los metales se consideran relacionados con el Lugar; por lo tanto, ningún COC fue seleccionado para el sedimento en el Río Guanajibo.

Agua de poro: Existe potencial para efectos adversos a los receptores ecológicos por exposición a metales (aluminio, bario, cromo, cobalto, cobre, hierro, plomo, manganeso, níquel y vanadio) en el agua de poro. Sin embargo, ninguno de los metales se consideran relacionados con el Lugar; por lo tanto, ningún COC fue seleccionado para el agua de poro del Río Guanajibo.

Basado en los resultados de la evaluación del riesgo ecológico medidas correctivas no son necesarias para proteger el medio ambiente por derrames en el pasado o posibles derrames de sustancias peligrosas en el futuro.

Resumen de las evaluaciones de riesgos

Basado en los resultados de la evaluación de riesgos a la salud humana, una acción correctiva es necesaria para proteger la salud pública, bienestar y el medio ambiente de posibles derrames de sustancias peligrosas en el futuro a las aguas subterráneas y, como una fuente continúa de contaminación de compuestos orgánicos volátiles a las aguas subterráneas, en los suelos en las propiedades Wallace y CCL. Además, suelo y agua subterránea en las proximidades de estas propiedades son una fuente de vapores sub-superficiales que puede dar lugar a exposición inaceptable a humanos a través de la vía de la intrusión de vapor. Basándose en los resultados a la salud humana y las evaluaciones de riesgo ecológico, una acción correctiva no es necesaria para aguas superficiales o sedimentos.

OBJETIVOS DE LA ACCIÓN CORRECTIVA

Los objetivos de acción remedial (RAOs, por sus siglas en inglés) son objetivos específicos para proteger la salud humana y el medio ambiente. Los contaminantes relacionados al lugar incluyen TCE, PCE, cis-1,2-DCE, cloruro de vinilo y 1,1-DCE. El medio contaminado abordado en el Plan Propuesto y en esta hoja informativa es el suelo que actúa como una fuente de contaminación al agua subterránea y vapores del suelo.

Tanto en Wallace como en CCL, las concentraciones de PCE y TCE fueron detectadas en muestras de agua subterránea tomadas en ambas propiedades, indicando que los contaminantes han migrado desde el suelo no saturado al suelo saturado y al agua subterránea. Teniendo en cuenta las altas concentraciones presentes en el suelo saturado que subyace a las zonas de origen, los datos indican que una gran masa de contaminantes pueda estar presente en el suelo saturado. Por lo tanto, residuos de contaminación con PCE y TCE en la zona vadosa es una principal amenaza y requiere remediación a través de tratamiento, siempre que sea posible.

Las fuentes de contaminación en el suelo del Parque Industrial el Retiro están en las propiedades ocupadas actualmente por Wallace y CCL. El suelo en estas dos propiedades, incluyendo la zona de saprolita superficial de los suelos saturados por debajo de la huella de la contaminación de la zona vadosa, donde los contaminantes originalmente en contacto con el agua subterránea, potencialmente contiene líquidos de fase no acuosa densa residual (DNAPL, por sus siglas en inglés) y probablemente la mayor masa del contaminante en el subsuelo que puede servir como fuente de contaminación del agua subterránea continua.

Muestras de vapor de suelo muestran concentraciones de vapores elevadas bajo el piso del edificio de Wallace y CCL, edificios ocupados en la actualidad, y como tal hay una amenaza de exposición a contaminantes tales como PCE, TCE, cis-1, 2-DCE, 1, 1-DCE y cloruro de vinilo. Estos contaminantes pueden representar riesgos para la salud humana por inhalación, ingestión y contacto dérmico. La EPA anticipa que los asuntos relacionados a la exposición a vapor serán atendidos por separado; por lo tanto, las tecnologías apropiadas para mitigar las exposiciones debido a la intrusión de vapor, como los sistemas de mitigación por debajo del piso, no están incluidas en la propuesta de acción para el Lugar.

Para proteger la salud humana y el medio ambiente, se han identificado los siguientes RAOs.

Los RAOs de suelo son:

- Prevenir/minimizar los suelos contaminados de la zona vadosa que sirven como una fuente de contaminación al agua subterránea.
- Reducir la masa del contaminante en el suelo de la zona saprolita superficial saturada que

sirve como una fuente de contaminación del agua subterránea.

El RAO de vapores del suelo es:

- Mitigar los impactos a la salud pública resultantes de la exposición existente o potencial a la intrusión de vapor del suelo.

Las áreas de la fuente de suelo que debe abordar la acción descrita en esta hoja de datos y en el Plan Propuesto se encuentran por encima y por debajo del nivel freático y parece ser tan profunda como la zona superficial de la saprolita.

RESUMEN DE ALTERNATIVAS CORRECTIVAS

En todas las alternativas correctivas activas se incluyen varios elementos comunes. Los elementos comunes que se enumeran a continuación no se aplican a las alternativas de No Acción.

Elementos comunes

Trabajo pre-diseño: una investigación pre-diseño (PDI, por sus siglas en inglés) se llevaría a cabo como parte del diseño del remedio. La extensión de la contaminación del suelo por debajo de los edificios sería delineado. Puesto que estas actividades podrían tener impacto a las operaciones comerciales en las instalaciones, se harán arreglos para minimizar la interrupción de las operaciones.

Sistemas de mitigación de Vapor: La EPA anticipa que sistemas para mitigación de vapor serán instalados en los edificios ocupados actualmente por Wallace y CCL para prevenir la intrusión de vapores. Incluso después de la remediación de suelos de la zona vadosa, el vapor de suelo todavía puede acumularse debajo de las losas del edificio y requerir la operación de los sistemas de mitigación para atenuar la intrusión de vapor del suelo hasta que el sitio este totalmente remediado.

Controles Institucionales: Mientras que el remedio del OU-1 discutido en este folleto y en el Plan Propuesto es tratar suelos contaminados en las áreas de la fuente en el Parque Industrial el Retiro, el agua subterránea contaminada incluyendo el área a ser atendida en OU-2 es la preocupación primaria a la salud humana en el Lugar. Como parte de la solución de OU-1, la EPA propone establecer controles institucionales (ICs, por sus siglas en inglés) que sería restringir el contacto con las aguas subterráneas

contaminadas a lo largo del área impactada. Colocando los ICs en las aguas subterráneas en este momento, la EPA puede reducir al mínimo el potencial de exposición humana mientras que el remedio de OU-2 está siendo seleccionado e implementado. Los ICs incluyen restricciones en el agua subterránea para la perforación en el área del agua subterránea contaminada, anuncios, avisos y educación pública.

Política Limpia y Verde de la EPA, Región 2

Los beneficios ambientales del remedio preferido pueden mejorarse tomando en consideración, durante el diseño, las tecnologías y prácticas que sean sostenibles de acuerdo con la Política Energética de la EPA de la Región 2.

Alternativas de remediación

Las alternativas de remediación se elaboraron por la combinación de tecnologías de remediación aplicables y opciones de proceso para cada medio contaminado. Las áreas a remediar en el Lugar incluyen:

- La zona vadosa con suelos contaminados sobre los objetivos de remediación.
- El suelo en la zona saturada y en la zona de saprolita superficial por debajo de la huella de la contaminación en la zona vadosa (como se describe a continuación).

Las dos zonas se denominan conjuntamente la zona de la fuente, que parece contener la mayor masa de contaminante en el subsuelo y sirve como una fuente continua de contaminación al agua subterránea.

Cinco zonas de fuente (SA), como se muestra en la figura 1 se identificaron en las propiedades ocupadas actualmente por Wallace y CCL. A continuación se describe con información específica cada fuente. Concentraciones de vapor de suelo altas se detectaron por debajo de la losa de piso, y el grado de contaminación del suelo debajo del edificio podría ser distinto y más grande que lo que se muestra en la figura 1.

- Área de Fuente 1 (SA-1) en la propiedad actualmente ocupada por Wallace: es el área aproximada donde históricamente se almacenaban drones. Se encontraron concentraciones altas de PCE y TCE en las muestras de vapor de suelo por debajo de la losa de piso. Por lo tanto, es necesario una investigación adicional del suelo debajo del

edificio en esta zona para poder definir la extensión de la contaminación.

- Área de Fuente 2 (SA-2) en la propiedad actualmente ocupada por Wallace: la contaminación del suelo se encuentra en esta zona fuera de los edificios como se ve en la figura 1. Es necesaria una investigación adicional del suelo debajo del edificio en esta zona para poder definir la extensión de la contaminación.
- Área de Fuente 3 (SA-3) en la propiedad actualmente ocupada por Wallace: esta área abarca el suelo donde se detectaron las mayores concentraciones de PCE fuera de un edificio en una zona pavimentada en muestras tomadas de la superficie del suelo hasta 2 pies y de 5 a 7 pies en el barreno WS-8. Las concentraciones de PCE disminuyeron con profundidad, indicando que la mayoría del contaminante es superficial en la zona no saturada de arcilla y limo, probablemente debido a la presencia de pavimento y la infiltración limitada de agua. Es necesaria una investigación adicional del suelo debajo del pavimento en esta zona o en el canal de drenaje sub-superficial para poder definir la extensión de la contaminación. Debido a que las concentraciones de contaminantes en el agua subterránea es relativamente moderada en este lugar (WS-8 con PCE en 233 µg/L) y el hecho de que las concentraciones disminuyen con la profundidad, la zona de saprolita de suelo no está incluida en esta zona.
- Área de Fuente 4 (SA-4) en la propiedad actualmente ocupada por CCL: contaminación de TCE y cis-1, 2-DCE en el suelo fue encontrado en concentraciones altas entre 5 y 7 pies pero parece ser localizado. Investigación de suelo adicional se recomienda en esta área para delinear más la zona de tratamiento.
- Área de Fuente 5 (SA-5) en la propiedad actualmente ocupada por CCL: contaminación de TCE en el suelo fue encontrado en concentraciones altas entre 10 y 22 pies. En la zona saturada, el TCE fue encontrado a una concentración de 27,700 µg/L de 19.5 a 23.5 pies; y en 65,400 µg/L de 26.5 a 30.5 pies. Muestreo de suelos y de agua subterránea adicionales se colectarían para el PDI para definir la zona de tratamiento.

Cuatro alternativas correctivas fueron evaluadas las cuales se describen brevemente a continuación. Detalles adicionales están disponibles en el Plan Propuesto del Lugar.

Alternativa S1 – No Acción

Costo Capital	\$0
Costo de Operación y Mantenimiento	\$0
Total del Valor Presente	\$0
Tiempo Estimado para lograr los RAOs	No logra los RAOs

La alternativa de No Acción no incluiría ninguna acción de remediación y sirve como base para la comparación.

Alternativa S2 – Excavación y Disposición Fuera del Lugar / Tratamiento In-situ

Costo Capital	\$12, 883,000
Costo de Operación y Mantenimiento	\$ 49,000
Total del Valor Presente	\$ 13,432,000
Plazo de construcción	12 a 18 meses
Plazo para lograr los RAOs	2.5 años

Puesto que el nivel y la distribución de la contaminación en cada área de la fuente es diferente, no todos los componentes de esta alternativa remedial se prevé que para se pueden aplicar a cada área de la fuente, como se resume a continuación.

- SA-1: excavación y disposición fuera del Lugar en la zona vadosa hasta 13 pies, seguido por el tratamiento in situ en el resto de la zona vadosa de 13 a 20 pies. Se excavarán aproximadamente 505 yardas cúbicas (yd³). Esta área está por debajo del edificio que tiene infiltración limitada. La zona de tratamiento se supone que sea desde la superficie del suelo hasta 20 pies.
- SA-2: excavación y disposición fuera del Lugar en la zona vadosa hasta 13 pies, seguido por el tratamiento in situ para el resto de la zona vadosa y la zona llana de la saprolita. Se estima que aproximadamente 3,827 yd³ de material será excavado en esta zona.
- SA-3: excavación y disposición fuera del Lugar en la zona vadosa hasta 13 pies, seguido por el tratamiento in situ para el resto de la zona vadosa hasta 20 pies. En esta área se excavará aproximadamente 2,238 yd³. Esta área está por debajo del edificio y la acera que tiene infiltración limitada, las concentraciones de contaminantes disminuyen con la profundidad. La zona de tratamiento se supone que sea desde la superficie del suelo hasta 20 pies.

- SA-4: tratamiento in-situ en el suelo de la zona vadosa y la zona llana de la saprolita de 5 a 40 pies.
- SA-5: tratamiento in-situ en el suelo de la zona vadosa y la zona llana de la saprolita de 5 a 40 pies. Las concentraciones de contaminantes del suelo eran moderadas, y la distribución vertical de los contaminantes indica que la mayoría ha emigrado a la zona llana de la saprolita.

Siguiendo la excavación de SA-1 y SA-3, se podría perforar e instalar tubos horizontales en la parte inferior de la excavación antes de rellenar. En cada área, estos tubos se conectarán con un tubo vertical que se extienda hasta la superficie y conectado a un tanque de almacenamiento. Aditivos orgánicos podría añadirse a este tanque de almacenamiento y por gravedad inyectados a las zonas de tratamiento para promover tratamiento in-situ biológicos anaeróbicos.

Alternativa S3 – Extracción de Vapor de Suelo (SVE) y Fase de Extracción Doble (DPE) / Tratamiento In-Situ

Costo Capital	\$5,448,000
Costo de Operación y Mantenimiento	\$1,880,000
Total del Valor Presente	\$7,328,000
Plazo de construcción	8 meses
Plazo de construcción	Por lo menos 10 años

Esta alternativa remedial constaría de los siguientes componentes principales:

- Instalación de la cubierta en SA-2 y SA-3;
- Instalación del sistema SVE y operación;
- Sistema de extracción de fase dual;
- Tratamientos en el lugar (in-situ);
- Evaluación del desempeño del tratamiento; y
- Restauración del Lugar

Puesto que el nivel y la distribución de la contaminación en cada área de la fuente es diferente, no se anticipa que todos los componentes se puedan aplicar a cada área de la fuente como se resume a continuación.

- SA-1: SVE en la zona vadosa.
- SA-2: SVE en la zona vadosa con DPE en la zona llana de la saprolita, seguido por el tratamiento in-situ descrito en la alternativa S2.

- SA-3: SVE en la zona vadosa.
- SA-4: Tratamiento in situ de la zona vadosa y la saprolita llana descrita en la alternativa S2.
- SA-5: DPE en la zona llana de la saprolita, seguida de tratamiento in-situ en la zona vadosa y la zona llana de la saprolita descrita en la alternativa S2.

En SA-1, SA-2 y SA-3, pozos verticales de SVE se instalarán en la zona no saturada para atender la contaminación de toda la zona vadosa sin extraer agua subterránea. Para propósito de establecer el costo se asume que se instalarán 3, 13 y 8, pozos de SVE respectivamente. El sistema anterior de tratamiento de suelo que se instalará será en una estructura pre-fabricada traída al Lugar para tratar el vapor de suelo extraído antes de liberarlo a la atmósfera. Se asume que el sistema SVE estará funcionando continuamente durante los primeros dos años e intermitentemente durante los siguientes ocho años.

El sistema de la DPE se instalaría en SA-2 y SA-5 para reducir la masa de contaminante en la zona llana de la saprolita antes de aplicar otros métodos de tratamiento in situ. La localización del DPE se basaría en el diseño del remedio. Se supone se instalarán 13 y 4 pozos, respectivamente para el DPE.

Tras el tratamiento del sistema DPE, la contaminación restante en los SA-2 y SA-5 será remediada con una tecnología de tratamiento in-situ.

Alternativa S4 – Remediación Termal In-Situ (ISTR) y SVE / Tratamientos In-Situ

Costo Capital	\$ 12,741,000
Costo de Operación y Mantenimiento	\$ 549,000
Total del Valor Presente	\$ 13,290,000
Plazo de construcción	1-2 años
Plazo de construcción	2.5 años

Esta alternativa remedial constaría de los siguientes componentes principales.

- Instalación de Cubierta SA-2, SA-3 y SA-5 (según sea necesario);
- Instalación y operación de SVE e ISTR;
- Clausura de ISTR;
- Evaluación del desempeño del tratamiento;
- Tratamiento in situ; y

- Restauración del Lugar.

Puesto que el nivel y la distribución de la contaminación en cada área de la fuente es diferente, no se prevé que todos los componentes se puedan aplicar a cada área de la fuente como se resume a continuación.

- SA-1: ISTR y SVE en la zona vadosa.
- SA-2: ISTR y SVE para ambos la zona vadosa y la zona llana de saprolita, seguido de tratamientos in situ.
- SA-3: ISTR y SVE en la zona vadosa.
- SA-4: Tratamientos In situ de la zona vadosa y la zona llana de la saprolita.
- SA-5: ISTR y SVE para ambos la zona vadosa y la zona llana de la saprolita, seguido por tratamiento in situ.

Pozos de SVE y de calentar se instalarían en la propiedad ocupada por Wallace (SA-1, SA-2 y SA-3) y CCL (SA-5). El sistema de calefacción de resistencia eléctrica (ERH) y calefacción conductor térmico (TCH) son los métodos más comunes para la recuperación térmica de contaminación para solvente clorinados. Se supone que se utilizará ERH.

El calentamiento de los suelos se anticipa que durará aproximadamente 100 días, durante el cual el sistema SVE operará para eliminar los contaminantes volatilizados. Análisis y muestreo adicional sería también necesario para cumplir con los requisitos de autorización de emisión de aire. Después de calentar, se necesitaría un período de enfriamiento de la tierra de aproximadamente 100 días antes de retirar el sistema y el abandono de los pozos de SA-1 y SA-3. El sistema SVE sería operado durante el período de enfriamiento y posiblemente más si se justifica.

Para los áreas SA-2 y SA-5, tratamiento in situ se llevaría a cabo en la zona llana de la saprolita, comenzando poco después de la fase ISTR, puesto que el calor residual sería propicio para el crecimiento de microbios.

EVALUACIÓN DE ALTERNATIVAS DE REMEDIACIÓN

Protección General a la Salud Humana y al Medio Ambiente

La Alternativa S1, No Acción, no satisface los RAOs y no sería protectora del medio ambiente

ya que no habría una acción de remediación. El suelo contaminado seguirá siendo una fuente de contaminación al agua subterránea y vapores del suelo.

Las Alternativas S2, S3 y S4 satisfacen los RAOs y serían protectoras del medio ambiente abordando las áreas de la fuente, en la medida posible. Tecnologías de tratamiento y excavación no serían capaces de tratar toda la contaminación por debajo de los edificios ocupados. De ser el caso, los edificios podrían actuar como un tapón para minimizar la infiltración del agua superficial y reducir la migración de contaminantes en las aguas subterráneas.

Cumplimiento de ARARs

No existen ARARs químico-específicos para el suelo Federales o para Puerto Rico. Sin embargo, los objetivos de remediación específicos del Lugar se cumplirían con las alternativas S2, S3 y S4 para los contaminantes sobre el nivel freático, y las tecnologías efectivamente eliminarían la masa del contaminante por debajo del nivel freático.

La excavación y eliminación fuera del Lugar bajo la alternativa S2 necesitaría satisfacer los requisitos de disposición de tierras bajo la Ley de Recuperación y Conservación de Recursos (RCRA, por sus siglas en inglés). Todas las alternativas activas cumplirían con los ARARs de acción-específica. Los ARARs de acción-específica no cumplirán en la NO Acción ya que ningún trabajo se llevaría a cabo.

Permanencia y efectividad a largo plazo

Bajo la alternativa de No Acción, la contaminación seguirá presente en la zona vadosa y migrará al suelo y potencialmente impactará en el futuro al agua subterránea. La alternativa de No Acción no es efectiva o permanente.

Para las alternativas S2 y S4, con excavación y remediación térmica además de tratamiento in situ, se espera un grado significativo de eliminación masiva permanente, con un alto grado de efectividad y permanencia a largo plazo. Para la alternativa S3 con DPE/SVE, limitaciones técnicas podrían significar que no toda la contaminación se eliminaría del suelo arcilloso. El radio de influencia de los pozos SVE sería bajo en suelo arcilloso. Es posible que significante difusión de la contaminación en la

arcilla se haya producido. El sistema SVE puede necesitar ser operado durante un periodo de tiempo mucho más largo que las alternativas S2 y S4 para alcanzar un nivel similar de eliminación masiva permanente.

Para cualquier tipo de contaminación por debajo del edificio que no es accesible para la excavación o tratamiento térmico, los edificios actuarían como una tapa para evitar la migración de contaminantes al agua subterránea.

Reducción de la Toxicidad, Movilidad o Volumen (M/T/V) a través del Tratamiento

La alternativa de No Acción no reduciría contaminantes T/M/V puesto que no llevaría a cabo ninguna acción correctiva.

Las alternativas de excavación y remediación térmica se espera puedan reducir significativamente M/T/V a través del tratamiento. DPE/SVE bajo la alternativa S3 probablemente reduciría T/M/V mediante tratamiento a un grado, pero su eficacia en los suelos apretados probablemente estaría limitado y por lo tanto, la reducción de T/M/V puede ser limitada. El alcance y efectividad de la reducción de la T/M/V por DPE/SVE tendría que monitorearse. El tratamiento in situ mejoraría T/M/V y se incluye en las alternativas S2, S3 y S4.

Efectividad a Corto Plazo

La alternativa de No Acción no tendría ningún impacto a corto plazo a la comunidad y al medio ambiente por no ocurrir ninguna acción correctiva.

Las restantes alternativas tendría efectos importantes a corto plazo en las empresas activas, comunidad local y los trabajadores de debido a las acciones correctivas activas y actividades de construcción y operación asociadas.

Operación en las instalaciones (es decir, Wallace) tendría que ser modificado o cerrado temporalmente. La excavación implica tráfico de camiones y el ruido de las operaciones de equipo pesado. La remediación térmica bajo la alternativa S4 requeriría la presencia de tuberías y elementos de tratamiento por un periodo de aproximadamente un año, causando la interrupción substancial a corto plazo en la propiedad. Asimismo, las actividades de excavación bajo la alternativa S2 podrían causar importantes perturbaciones a corto plazo y

requieran cierre temporero de empresas el parque industrial. Por el contrario, SVE y otras infraestructuras de tratamiento in situ (parte de todas las alternativas activas pero la mayor parte de los trabajos que se realicen para la alternativa S3) requerirían sustancialmente menos trastornos a corto plazo durante la instalación, y mientras que los sistemas pueden estar presentes por un periodo de años, no plantearía dificultades significativas en el uso de la propiedad.

La Alternativa S3 (DPE/SVE) tendría huella menor en términos de eficacia a corto plazo que las otras dos alternativas activas. Monitoreo de aire, controles de ingeniería y protección apropiada para los trabajadores apropiado (Equipo de Protección Personal, PPE) será utilizado para proteger a la comunidad y los trabajadores para estas alternativas.

Alternativas S2 y S4 alcanzarían los RAOs en aproximadamente 2.5 años mientras que la alternativa S3 se espera que alcance los RAOs en aproximadamente 10 años.

Aplicabilidad

La alternativa de No Acción sería más fácil técnicamente y administrativamente a implementar por no se requerir trabajo adicional en el Lugar.

Tanto la alternativa S2 (remediación térmica) y la alternativa S4 (excavación) para su implantación enfrentarían considerables obstáculos. Puesto que la excavación se produciría directamente dentro y adyacentes a los edificios, soporte y refuerzo de zapatas sería necesario para apoyar las estructuras durante el trabajo. Residuos peligrosos excavados tendrían que ser transportados a los Estados Unidos continentales ya que hay no existen vertederos de residuos peligrosos en Puerto Rico.

Para la remediación térmica, la presencia de edificios (con inquilinos) en las zonas de tratamiento presenta desafíos en cuanto a ejecución, como la instalación de elementos de calefacción dentro de un centro activo. Es posible instalar resistencias en ángulos u horizontalmente en la zona de tratamiento desde afuera de los edificios.

Para la Alternativa S3, la mayor limitación en aplicabilidad sería el acceso de los equipos de perforación en la zona de tratamiento. La limitada eficacia del SVE/DPE en suelos arcillosos es

también una preocupación de aplicabilidad; sin embargo, se prevé que puede ser superado por extender el plazo de ejecución a un estimado de 10 años, momento en el que se puede esperar un nivel comparable de eliminación masiva, en comparación con las otras alternativas activas.

Costo

A continuación se proporcionan los estimados de costos para todas las alternativas.

Alternativa	Costo Capital	Costo de Operación y Mantenimiento	Total del Valor Presente
S1	\$ 0	\$ 0	\$ 0
S2	\$12,883,000	\$ 549,000	\$ 13,432,000
S3	\$5,448,000	\$1,880,000	\$7,328,000
S4	\$12,741,000	\$549,000	\$13,290,000

Comunidad/apoyo Agencia aceptación

La JCA está de acuerdo con la alternativa preferida recomendada en el Plan Propuesto.

Aceptación de la Comunidad

Aceptación de la comunidad al remedio preferido será evaluada después de la culminación del periodo de comentario público y será descrito en la sección de Resumen de Respuestas el cual será incluido en el ROD del Lugar. El ROD es el documento que formaliza la selección del remedio para un lugar.

REMEDIO RECOMENDADO:

La Alternativa S3 (Extracción de Vapor de Suelo/Extracción Doble fase/Tratamiento In-Situ) es la alternativa preferida para las áreas de fuente en el suelo. Bajo esta alternativa, las zonas de la fuente en el suelo se atenderán con extracción de vapor del suelo en la zona vadosa en combinación con DPE en la zona llana de la saprolita, seguida por tratamiento in situ. Para esta alternativa, se realizara un estudio piloto como parte del PDI para recoger los parámetros de diseño para el sistema SVE y DPE. Para el diseño de un sistema de extracción de vapor, se llevaría a cabo una prueba de permeabilidad de aire para determinar los parámetros de diseño específicos como el flujo de aire posible, el vacío necesario para inducir el flujo, el radio de influencia del vacío aplicado y las tasas de remoción del contaminante inicial.

Los dos edificios y las entradas pavimentadas en la propiedad actualmente ocupada por Wallace

actuarían como cubiertas para el sistema SVE para evitar cortocircuitos con la atmósfera. Una cubierta impermeable adicional puede ser instalada para la implementación del SVE. Cualquier cubierta adicional sería diseñada para limitar la infiltración del agua de lluvia en los suelos contaminados, lo que significa que materiales duraderos de baja permeabilidad serían utilizados, y el agua de lluvia sería dirigido lejos de la zona de remediación. Para efecto de estimación de costos, se supone que una cubierta adicional no será necesaria.

Para efectos de estimación de costos, se supone se instalaría pozos SVE 3, 13 y 8 en las zonas SA-1SA-2 y SA-3, respectivamente. Una red de pozos de monitoreo serán instalados para monitorear el progreso de la eliminación de contaminantes y los cambios en la presión de vapor del suelo. Para efectos de estimados de costos, se supone que el sistema SVE vay a funcionar continuamente durante los primeros dos años e intermitentemente durante los siguientes ocho años. La implementación de la solución SVE podría realizarse de forma simultánea con el DPE, o DPE podría ser operado seis meses a un año después del comienzo del sistema SVE, dependiendo del nivel de las concentraciones de contaminantes inicial y cualquier otra consideración de logística.

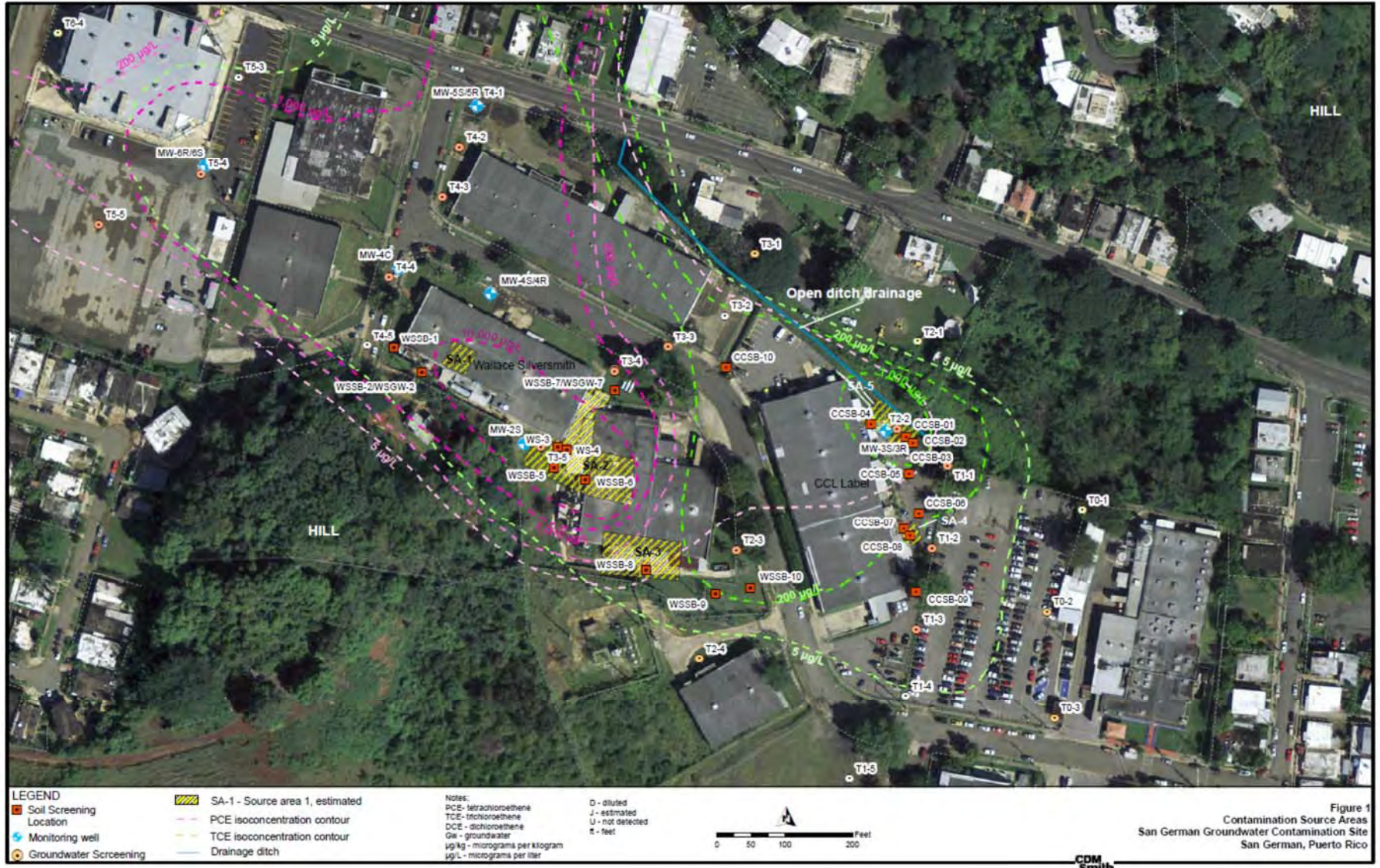
El sistema de la DPE se instalaría en la SA-2 y SA-5 para reducir la masa de contaminante en la zona llana de la saprolita antes de otro tratamiento in situ. Se instalarían pozos DPE basado en el diseño del remedio. Para efectos de estimados de costos, se supone que se instalarán 13 y 4 pozos DPE en las zonas SA-2 y SA-5, respectivamente.

El sistema de tratamiento de agua se instalará en el mismo edificio que albergaría el sistema de tratamiento de vapor. Se asume que este sistema tenga bombas de extracción de agua subterránea, tuberías, bombas de transferencia, filtros de bolsa y un extractor de aire además del separador de agua y aire y carbón activado de vapor. El agua tratada sería descargada en la zanja de drenaje cerca del lugar con un permiso apropiado. El agua descargada reuniría los requisitos de permiso de descarga de Puerto Rico. Además, efectos de estimados de costos, el sistema DPE está previsto para funcionar por un año.

BASE PARA EL REMEDIO DE PREFERENCIA

Se cree que la alternativa preferida podrá proporcionar el mejor balance entre las alternativas basado en la información disponible a la EPA en este momento. La EPA y la JCA entienden que el remedio recomendado: tratara las principales amenazas, protege la salud humana y el medio ambiente, cumple con ARARs, es costo efectivo y utiliza soluciones permanentes y tecnologías de tratamiento alternativas o tecnologías de recuperación de recursos en la medida máxima posible. El remedio recomendado: también cumplirá la preferencia legal por el uso de tratamiento como un elemento principal. La alternativa preferida puede cambiar en respuesta a comentarios públicos o nueva información.

Mientras que las tres alternativas activas pueden alcanzar niveles de protección similares y las alternativas S2 y S4 parecen capaces de alcanzar los RAOs en un período de tiempo más corto (2.5 años frente a 10 años), las interrupciones a corto plazo de los ocupantes y los desafíos de aplicabilidad son substancialmente mayores que el de la alternativa S3. La alternativa S3 también no presenta problemas de disposición fuera del Lugar como la alternativa S2 y es considerablemente menos costoso.



**APPENDIX V
ATTENDANCE SHEET**

**San German Groundwater Contamination Superfund Site
OU-1**

**San German Groundwater Contamination Site
Public Meeting – August 19, 2015 6 to 8 p.m.**

Name	Address	Phone	Email
Ana Polou	PR 11200	787-284777 LAT 3437	ana.polou@pridco.pr.gov
Raúl Colá	PR 11200	787-26-2240	raul.colá@pridco.pr.gov
Jorge García	MCV P.O. Box 364225 San Juan PR 00934	787-250-1814	JJG@MCVPR.com
Venus Sombria	CCLabel (San German) Inc. Rd. 102 Km 33.2 S.G	787 892-1268	lperez@cclabel.com
Ileana Cardona	(b)(6)		
Jose C. Asplet	PO Box 192927 San Juan PR 00919-2927	787-397-8900	JCAplet@ENTRPR.com
Ramón A. Pérez	PO Box 1177 San German PR 00683	787 533 646	ramon.perez@lifetimebrands.com
Lizette M. Ocasio	(b)(6)		
Pedro Mieres	PO Box 363507, S.J. PR 00934	787-513-6149 787-759-3192	pmieres@farlan.com
Elise M. Rodríguez	(b)(6)		
AUGUSTO H. ORTIZ	AAA-SEDE SULTANA MARIAGUEZ	652-1360 X-3231	augusto.ortiz@acueductospr.com

San German Groundwater Contamination Site
Public Meeting – August 19, 2015 6 to 8 p.m.

Name	Address	Phone	Email
Pascual E. Velázquez	Junta de Calidad Amb.	787 767-8181 Ext. 3253	pascualvelazquez@ jca.gobierno.pr
J. Reyes	CDM Smith	(787) 406-3331	reyesjo@cdmsmith.com
M. Corlato	Anased	787-238-3240	
Cenilda Ramirez	Tetra Tech	787-632-8329	cenilda.ramirez@ tetratech.com
S. Cero	Cib. Rio	479-1062	
Jucy Salas	(b)(6)		
Jose Garcia	Municipio de S. German	787-264-7386	jigarcia@ municipio.de.san german.com
Orlando Velez Rodriguez	(b)(6)		
Nelson J. Cero	(b)(6)		
Candido Rodriguez	(b)(6)		
Alfonso M.	(b)(6)		

APPENDIX VI

**TRANSCRIPT OF THE PUBLIC MEETING
San German Groundwater Contamination Superfund Site
OU-1**

**REUNIÓN PÚBLICA SAN GERMÁN
CONTAMINACIÓN DEL AGUA SUBTERRÁNEA
PROGRAMA DE SUPERFONDO
SAN GERMÁN, PUERTO RICO**

Fecha: 19 de agosto de 2015

Hora: 6:00pm

Lugar: Cancha de la Urbanización Santa Marta

Brenda Reyes: Buenas noches, le voy a agradecer que tomen asiento y pasen aquí para dar inicio. Buenas noches, muchísimas gracias por estar aquí con nosotros en la tarde de hoy, y bienvenidos todos. Esto es una reunión informativa, una reunión pública informativa sobre el caso de Superfondo, mejor conocido como caso de Superfondo de San German, pozos de San Germán. En la tarde de hoy me acompañan compañeros de la Junta de Calidad Ambiental de Puerto Rico, CDM, contratistas para el lugar y el Dr. Adalberto Bosque de la EPA, gerente de proyecto. Si no me presenté mi nombre es Brenda Reyes, oficial de prensa y asuntos públicos. En la tarde de hoy el Dr. Bosque nos va a estar ofreciendo una presentación. El formato como vamos a hacer es que el va a ofrecer la presentación, al final ustedes hacen sus preguntas. Les voy a pedir que cuando vayan a hacer las preguntas utilicen este micrófono y digan su nombre, apellido, si son contratista, residente o a quién representa. Es bien importante porque tenemos hoy transcripción y ella tiene que poner eso. Si alguien tiene algún comentario que ya lo tenga por escrito o algo que quiera decir pues también le agradecemos si puede pasar por aquí y ofrecerlo. Adalberto, sí ya estamos. Importante, darle gracias al señor alcalde Isidro Negrón que está aquí con nosotros, gracias por ayudarnos a gestionar las facilidades. Esto ha sido un trabajo que venimos haciendo ya hace algunos añitos con el municipio. Siempre nos ofrecen su ayuda y su

cooperación, así que Sr. Alcalde muchas gracias. Dr. Adalberto Bosque se le busca. Dr., se le solicita.

Adalberto Bosque: Gracias Brenda, buenas tardes. Buenas tardes, ¿no? Hace bastante calor, ya prendieron el abanico, esperamos que refresque un poco. Vamos a estar compartiendo con ustedes en esta tarde. Esperamos que no sea mucho tiempo pero que el tiempo que podamos compartir con ustedes le podamos dar un resumen. Le podemos dar un resumen de la investigación que ha estado realizando la Agencia de Protección Ambiental Federal aquí en el pueblo de San Germán. Ha sido un trabajo en equipo. Muchas personas envueltas, principalmente los ciudadanos de la Urbanización Santa Marta, Porta Coeli y Riverside. El Sr. Alcalde y su personal. Así también con las empresas, las compañías que nos han estado proveyendo acceso y ayudando en la logística para poder llevar a cabo este estudio que estaremos hablando en esta tarde. Sumamente importante cuando hablamos de este estudio, este estudio realizado aquí en el pueblo de San Germán, específicamente por la contaminación de tres pozos utilizados por la Autoridad de Acueductos y Alcantarillados, que fueron cerrados debido a la detección de unas substancias orgánicas llamadas tetracloroetileno y tricloroetileno, que le estaremos presentando la información durante la presentación. Cuando la Agencia de Protección Ambiental Federal hace este estudio, este estudio está dividido en dos partes. La parte que estaremos hablando en esta noche o en esta tarde, es la parte que tiene que ver específicamente con la fuente de contaminación. Se hizo la investigación, se determinó de donde se originaban los compuestos orgánicos volátiles que impactaron los pozos de Acueductos y Alcantarillados, entiéndase el Pozo Retiro, Lola 1 y Lola 2, que fueron cerrados para el

año 2006. La segunda parte de la investigación que será, esperamos Dios mediante, que para el próximo año, continúa llevándose a cabo, que tiene que ver con el agua subterránea contaminada desde el Parque Industrial El Retiro en dirección noroeste hacia los pozos que fueron cerrados de la Autoridad de Acueductos y Alcantarillados. Brenda les indicó que las preguntas que puedan tener las dejamos para el final si nos hacen el favor. Todo lo que ustedes digan eventualmente va a estar, aquí se está tomando nota de todo lo que se diga y todas las preguntas. Todas las preguntas que se hagan en esta noche, así también como las preguntas que hagan por escrito van a ser contestadas e incluidas en el documento que se llama "Récord de decisión", que estará firmando o espera firmar la Agencia de Protección Ambiental Federal para el día 30 de septiembre de este año. Pregunta tras pregunta, todas las preguntas van a ser debidamente contestadas en ese record administrativo, en ese documento de respuestas. Bien, cuando se lleva a cabo una investigación como la que estamos llevando, hay diferentes pasos.

Hay varios objetivos que tiene la Agencia de Protección Ambiental Federal cuando lleva a cabo una investigación de este tipo (*ver diapositiva número 2 de la presentación: enfoque del estudio*). El primer objetivo que tiene la Agencia cuando lleva a cabo una investigación de esta naturaleza, cuando hay un lugar que está contaminado, bien sea el agua subterránea contaminada, el agua superficial contaminada, suelo contaminado, independientemente el medio que esté contaminado hay varios objetivos. Estos objetivos fueron contestados y completados durante esta investigación. El primer objetivo fue definir la magnitud y la extensión de la contaminación. En el caso aquí de San Germán para los años 2001 al 2005 aproximadamente estos tres pozos utilizados

por la Autoridad de Acueductos y Alcantarillados fueron impactados o se detectó la presencia de compuestos orgánicos volátiles. En aquel momento la concentración máxima que se detectó de tetracloroetileno fue 6.4 partes por billón, el estándar de agua potable, de agua para consumo, son 5 partes por billón, y en el año 2006 se cerró ese pozo. Quiere decir que eventualmente la Agencia Protección Ambiental Federal en un caso como el de aquí de San Germán el agua subterránea contaminada, la Agencia investiga, lleva a cabo una investigación para determinar la cantidad de área que ha sido impactada, el medio que ha sido impactado. En este caso, para poder definir de una forma vertical y una forma horizontal la Agencia sigue tomando muestras, hincando pozos de muestreo, tomando muestras de suelo, agua superficial, agua subterránea, muestra de sedimento. El Río Guanajibo se tomó muestra, para ver si había habido un impacto. Los sedimentos se muestrearon e inclusive se toman muestras de los vapores que puedan estar debajo de algunas estructuras, y eso también se hizo en esta investigación y se determinó la extensión y la magnitud de la contaminación y estaremos hablando. Una vez la Agencia tiene la información con relación al tipo de contaminante, las concentraciones presentes, dónde se origina ese contaminante, hasta donde llega ese contaminante, los medios afectados, se lleva a cabo lo que se conoce como un avalúo de riesgo a la salud humana y al ecosistema. Donde en base a la información obtenida durante la investigación, los posibles receptores, las vías de exposición, el contaminante cómo se mueve desde la fuente de contaminación hasta el receptor, el individuo, la población que pueda recibir esa contaminación, así también como las personas, la población que pudiera estar impactada independientemente la vía o la ruta de exposición a la cual la persona se puede estar exponiendo. Hay cuatro

rutas de exposición: ruta de inhalación, el contaminante si es volátil se puede estar inhalando, usted cuando respira lo inhala, pudiera estar ingiriéndolo si toma agua contaminada con un contaminante, pudiera ser a través del contacto dermal, o pudiera ser a través de inyección. En este caso pudiera ser a través de inhalación, contacto dermal o inhalación. Eventualmente en este estudio que es parte del record administrativo se determina si el riesgo que representan los contaminantes a la población expuesta o con el potencial de ser expuesta, hay un riesgo aceptado o un riesgo no aceptado. Cuando digo riesgo aceptado o no aceptado, siempre que hablamos de riesgo tenemos que decir o el riesgo es aceptado o es no aceptado. Siempre hay riesgo, aún para uno levantarse hay riesgo de uno caerse de la cama o tropezar uno y caerse. Quiere decir que se determina si hay un riesgo no aceptable para la población que pudiera exponerse. Eventualmente se prepara un documento que se llama el estudio de viabilidad, en ese estudio de viabilidad, en ese documento, una vez que se identifica que hay la necesidad de tomar una acción se evalúan diferentes alternativas desde la alternativa de no acción. La ley que provee la autoridad a la Agencia de Protección Ambiental Federal para llevar a cabo este tipo de investigación y establecer las responsabilidades en las partes que pueden haber sido de una forma u otra responsable de la contaminación establece que una de las alternativas que tiene que ser evaluada es la de no acción. Quiere decir no acción y de ahí en adelante se evalúan otras alternativas para ser consideradas. En este caso se evaluaron cuatro alternativas incluyendo la no acción. Por último, en este proceso que estamos llevando a cabo en el día de hoy, la Agencia de Protección Ambiental Federal en agosto 12 liberó al público, hizo disponible al público lo que nosotros conocemos

como el plan propuesto, ustedes tienen copia del plan propuesto. Los documentos que son la base para la toma de decisión de la Agencia de Protección Ambiental Federal, se pusieron en los diferentes lugares. En el caso de San Germán están en la alcaldía, en las oficinas de la Agencia de Protección Ambiental Federal en Guaynabo, en las oficinas de la Junta de Calidad Ambiental y así también en la oficina de la EPA en la ciudad de Nueva York, Manhattan. Bien. Hay un proceso que se tiene que llevar a cabo cuando se descubre que hay un lugar contaminado, este es un proceso desde el descubrimiento del lugar, independientemente. En este caso, 2001 a 2005 se detectó la presencia de compuestos orgánicos volátiles impactando los pozos Retiro, Lola 1, Lola 2. La Agencia de Protección Ambiental Federal interviene en el proceso, para los años 2006 aproximadamente la Agencia de Protección Ambiental Federal una vez interviene, lleva a cabo unos estudios e identifica aproximadamente cuarenta y cuatro... cuarenta y cuatro facilidades o actividades que de una forma u otra había la duda o había la preocupación o la interrogante de si podían ser o no los causantes de esta contaminación en estos pozos. Eventualmente, la Agencia de Protección Ambiental Federal hace un estudio preliminar... hace un estudio preliminar. Esa cantidad de posibles fuentes de cuarenta y cuatro, eventualmente toma muestras en los pozos de Autoridad de Acueductos y Alcantarillados y eventualmente determina que se quedaran aproximadamente cinco facilidades como posibles fuentes de contaminación. Entiéndase, aquí en el pueblo de San Germán está el Parque Industrial del Norte, el Parque Industrial en el norte al norte del Río Guanajibo y está el Parque Industrial El Retiro. El Norte está donde estaba anteriormente Cordis. Ahí estaba Digital anteriormente, PCB Horizon. Al norte del Río Guamaní la Agencia de

Protección Ambiental Federal investiga y descarta el Parque Industrial del Norte, el Río Guanajibo como posible fuente de la contaminación de los tres pozos que fueron impactando, y quedando en la investigación 5 facilidades que estaremos mencionando. Cinco, digo propiedades, cuando hablamos de facilidades recuérdense hay unas compañías que actualmente están ubicadas en estos lotes. Digo lotes o propiedades donde se investigaron, no necesariamente estamos diciendo que estas compañías fueron las responsables de haber causado la contaminación. Lo que sí estamos indicando es que se llevó a cabo una investigación, y la investigación determinó que en ese lote, donde actualmente existen unas compañías que cuando pasamos por allí tienen nombre y apellido, se identificaron como fuente de contaminación. Actualmente, la agencia y sus abogados siguen investigando y eventualmente estarán en contacto o han estado en contacto con diferentes compañías. Se llevó a cabo esta investigación eventualmente en marzo 19 del año 2008. Se incluyó el lugar en la Lista Nacional de Prioridad (*ver diapositiva número 3 de la presentación: Proceso Superfondo*). La Lista Nacional de Prioridad es una lista que crea la Agencia de Protección Ambiental Federal, la creó desde sus orígenes en el año 1980, donde se establece un procedimiento de puntuación y eventualmente aquellos lugares que ameritan ser investigados, porque ameritan o representan un riesgo no aceptado... pudieran representar un riesgo no aceptado es sumamente importante llevar a cabo la investigación. Le da la autoridad a la EPA para que pueda investigar, incurrir en el costo, pagar por la investigación que se lleve en el lugar. Marzo 2008 se incluye en la Lista Nacional de Prioridad y posteriormente aproximadamente en el año 2010, 2015 hasta el día de hoy la Agencia llevó a cabo la investigación que estaremos hablando en

esta tarde. Estamos en esta etapa, un periodo de comentario de treinta días que finaliza en septiembre 11, comenzó agosto 12 y finaliza en septiembre 11. Posteriormente, la Agencia una vez recibidos los comentarios tanto en esta tarde como los comentarios escritos, la Agencia finalmente con la anuencia del Gobierno de Puerto Rico, a través de la Junta de Calidad Ambiental firma lo que se conoce como el Record de Decisión, que es el documento formal donde la Agencia de Protección Ambiental Federal estará decidiendo la acción que se va a tomar en el caso de San Germán. Al momento es simplemente una propuesta que está haciendo la Agencia de Protección Ambiental Federal con la anuencia o con el respaldo del Gobierno de Puerto Rico, a través de la Junta de Calidad Ambiental. Se firma el Record de Decisión, eventualmente la Agencia de Protección Ambiental Federal entra en conversaciones. Ya ha entrado en conversaciones con... si están identificadas compañías, facilidades que pudieran ser responsables, la Agencia de Protección Ambiental Federal entra en unos diálogos con estas compañías, de estar presentes, haberse identificado y finalmente se firma lo que se conoce como un acuerdo... un "agreement", un acuerdo por consentimiento, donde las compañías si se han identificado aceptan, acuerdan llevar a cabo el trabajo de diseño y eventualmente de implementación de la acción en el lugar y finalmente se opera el sistema hasta tanto y en cuanto cumpla con los límites establecidos de limpieza, bien.

¿Dónde estamos ubicados?, pues no hay que mencionar mucho donde estamos ubicado, aquí son, ustedes son de San Germán. Los que no, pues sabemos prácticamente donde estamos, hablamos de la historia... hablamos de la historia, bien. Tenemos aquí esta figura (*ver diapositiva número 4 de la presentación: Mapa de*

Localización), aquí vemos el Río Guanajibo, aquí podemos ver los tres pozos, los tres pozos que fueron impactados, aquí podemos ver el Parque Industrial del Retiro, aquí está el Parque Industrial en el norte del Río Guanajibo. Entiéndase, aquí hay una facilidad donde la Agencia de Protección Ambiental Federal, el programa que tiene que ver con desperdicios peligrosos ha estado supervisando unos trabajos de limpieza. Aquí es donde estaba Digital anteriormente, que posteriormente estuvo PCB Horizon y la Junta de Calidad Ambiental ha estado llevando a cabo un estudio (*ver diapositiva número 5 de la presentación*). En este estudio pues se tomó muestras, tomó muestras en dirección hacia el Río, ¿no? En dirección hacia el Río para saber hasta dónde llegaba la contaminación que se estaba remediando en esta facilidad y se determinó que este Parque Industrial no fue la fuente del impacto en estos tres pozos. No así el Parque Industria o algunos lotes, algunas operaciones en el Parque Industrial El Retiro que sí se determinó que habían sido la fuente. La fuente del impacto de estos tres pozos propiedad de Autoridad de Acueductos y Alcantarillados. El lugar de la investigación pues definitivamente mencioné incluye el Parque Industrial El Retiro, incluye los tres pozos cerrados y áreas aledañas en dirección noroeste, digo en dirección noroeste recuérdense del parque industrial yendo en dirección hacia los tres pozos que fueron cerrados (*ver diapositiva número 6 de la presentación: Descripción del Lugar*). En esa dirección pues tenemos varias urbanizaciones que han sido parte del estudio: la Urbanización Santa Marta, la Urbanización Porta Coeli, la Urbanización Riverside. Esas tres urbanizaciones fueron parte de la investigación que nosotros llevamos a cabo.

Este trasfondo histórico (*ver diapositiva número 7 de la presentación: Trasfondo Histórico*) prácticamente ya se los mencioné, bien. Este es el mapa que ustedes vieron anteriormente (*ver diapositiva número 8 de la presentación: Investigación Remediativa, Muestras de Suelo*), es sumamente importante que las cinco, las cinco, cinco lotes. Recuérdense que inicialmente yo les mencioné que la EPA había identificado cuarenta y cuatro facilidades o actividades como posibles lugares para ser investigado. Eventualmente la Agencia, en base a su investigación, fue eliminando de la lista aquellos que no iban a ser o que no eran fuente de contaminación, o fuentes para ser investigados y llegó a esta lista. Tenemos por aquí en el Parque Industrial El Retiro, tenemos los lotes donde actualmente se encuentra la compañía Wallace Silversmiths de Puerto Rico Ltd., ¿no? Para propósitos del documento nosotros pues decimos que de ahí en adelante se conoce como... le vamos a decir Wallace, pero el nombre es Wallace Silversmiths de Puerto Rico. Tenemos el lote donde actualmente está ubicada la compañía CCL Insertco de Puerto Rico, tenemos el lote donde actualmente la compañía Pitusa, donde está Pitusa actualmente, donde está actualmente un lote que está vacante, no hay nadie ocupándolo. Un edificio, un edificio donde estaba anteriormente la compañía Baytex, actualmente de hace un tiempo hacia acá el lote está desocupado. Tenemos, tirando hacia el pueblo tenemos el lote donde está ubicado un "dry cleaners", que se llama Acorn Dry Cleaners, que también se tomaron muestras del suelo en esas cinco facilidades. De estas 5 facilidades, pues la EPA tomó muestras y eventualmente se descartaron tres, permaneciendo dos lotes en la investigación y posteriormente identificado como fuente de contaminación, donde está actualmente el lote, donde está actualmente la compañía Wallace Silversmiths y el lote

donde se encuentra actualmente CCL Insertco o CCL, bien. Ese es en el Parque Industrial El Retiro. Durante la investigación del suelo y entiéndase se hacen unos barrenos para determinar la extensión de la contaminación, si hay contaminación en el lote, en el área, en los predios donde está ubicada la facilidad. Donde opera actualmente, el lote donde opera actualmente la compañía Wallace. Recuérdense el nombre que yo les mencioné, Wallace Silversmiths, se encontró contaminación en suelo de aproximadamente 46,000 (ver diapositiva número 9 de la presentación: *Investigación Remediativa, Resultados de Estudio de Suelo*), la concentración más alta en suelo fue de 46,000 partes por billón, 46,000 partes por billón. El contaminante principal fue, este que se abrevia PCE, por sus siglas en inglés, que es tetracloroetileno. Esos son solventes, solvente. La concentración mayor de tricloroetileno, otro solvente y entiéndase hay otros contaminantes que pudieran ser producto de biodegradación, pudieron ser producto de biodegradación del primero. Está el papá y viene el hijo, y puede venir el nieto. No necesariamente el nieto tiene que ser menos peligroso que el papá, pudiera ser que el nieto, como el caso de “vinyl chloride”, cloruro de vinilo, que es más perjudicial a la salud que el primero. No estamos diciendo que el nieto, digo que se produjo como consecuencia del primero, hay mayor concentración, la concentración mayor en el lote de Wallace es de tetracloroetileno. Posteriormente viene tricloroetileno, entiéndase cuando se realiza la investigación del agua, del agua, el contaminante mayor encontrado en este lote, en este lote es de tetracloroetileno, que concuerda con las concentraciones encontradas en el suelo. Estamos hasta ahí.

Aquí tenemos la facilidad el lote donde se encuentra actualmente la compañía Wallace Silversmiths (*ver diapositiva número 10 de la presentación*) y los cuadrillos que están en amarillo representan los puntos donde se encontraron unas concentraciones por encima de los niveles que la Agencia de Protección Ambiental Federal entiende que son importantes, que levanta la banderita ¿no?, indicando que hay que investigar. En este lote y posteriormente lo estaremos viendo, hay 3 áreas que son áreas de preocupación o áreas donde cuando nosotros presentemos la alternativa de remediación se entiende que hay que llevar a cabo una remediación. Entiéndase esta porción en esta esquinita, esta área aquí y esta área aquí y esta área en esta otra esquinita. Quiere decir que en este lote de Wallace, donde está Wallace Silversmiths actualmente hay tres áreas. Área 1, área 2 y área 3, para propósitos de la remediación, de la acción de remediación van a haber cinco zonas que hay que remediar actualmente. Tres en este lote y las otras tres, las otras dos estarán en el lote que actualmente ocupa CCL, bien. Concentración máxima de tricloroetileno, el contaminante que se detectó con mayor concentración en el caso de CCL fue este que se llama tricloroetileno (*ver diapositiva número 11 de la presentación: Investigación Remediativa Resultados del Estudio de Suelo*), ese fue el de concentración mayor, con una concentración de 3,600 partes por billón. Entiéndase, tanto la concentración en el lote de Wallace, con concentración de tetracloroetileno (PCE) en suelo de 46,000 ppb mg/kg concuerda, ustedes lo van a ver, con la concentración mayor de contaminación en agua subterránea porque cuando vamos a agua subterránea, usted va a ver que en el lote donde está ubicado Wallace se encuentra alta concentración en suelo de tetracloroetileno y en el agua subterránea. Entiéndase, esta acción es fuente. En esta

acción estamos tratando, la remediación propuesta, la alternativa, y la que estamos recomendando estará lidiando con el suelo, recuérdense que cuando nosotros estamos aquí hay suelo que no hay agua en la zona que nosotros llamamos el "vadose zone", y eventualmente comienza a haber un poco de agua, comienza el agua. Se encontraron concentraciones altas en suelo y cuando llegamos a la porción donde está el agua, dónde está el agua, también se encontraron altas concentraciones de tetracloroetileno, en el caso de Wallace, en el lote estoy hablando del lote. El lote donde está la compañía, con concentraciones de tetracloroetileno en aguas subterráneas de hasta 26,000 partes por billón. El estándar es 5 de agua potable, bien. En el lote de CCL, aquí podemos ver en el lote donde se encuentra CCL, aquí podemos ver el lote donde está Wallace, el lote donde está CCL, el lote donde está la Former Baytex anteriormente, un lote que está vacío (*ver diapositiva número 12 de la presentación*). Aquí se encontraron concentraciones, mencioné anteriormente de 3,600, el contaminante principal fue tricloroetileno. La concentración mayor fue 3,600 y la concentración mayor en agua subterránea, estamos hablando posiblemente de 28, 30, 31 "shallow", llanita se encontraron concentraciones en este lote de hasta 65,000 partes por billón de tricloroetileno. Quiere decir que concuerda con los hallazgos tanto del suelo y el agua subterránea en las dos compañías. Quiere decir que estamos viendo en este lote una concentración principal, también hay contaminante, hay tetracloroetileno. Aquí podemos ver, esto es tetracloroetileno. Tenemos las concentraciones, ¿no? Esta tablita presenta en las primeras... la última línea representa concentraciones en aguas subterráneas. Se estaba haciendo el barreno aquí tenemos ejemplo 0-2 pies, 5-7 pies, 10-12 pies, así sucesivamente. Aquí

podemos tener yo creo que de 15-17 pies si mi vista no me falla, posiblemente 30-42 aguas subterráneas. Ya se entró en aguas subterráneas y se pudo detectar la presencia de unos compuestos, recuérdense en suelo y eventualmente en agua subterránea. Lo mismo sucedió aquí en la facilidad, en el lote donde se encuentra actualmente Wallace, que podemos ver contaminantes específicamente tetracloroetileno. Se recuerdan que yo les mencioné que la concentración mayor de tetracloroetileno era de 46,000 ppb en suelo y aquí lo podemos ver de 0-2 pies hay contaminación, 5-7 hay contaminación, 10-12 pies hay contaminación, etcétera, etcétera. El agua subterránea eventualmente pues podemos ver el impacto en el agua subterránea, eso fue suelo y podemos ver también cuando se entró a la interface con el agua subterránea.

Entre los estudios que se realizaron aquí, como parte de esta investigación se llevó a cabo también una investigación para determinar si había la presencia o no de vapores estando siendo acumulados los vapores. Recuérdense que los vapores tienden a salir de si están en el agua o en el terreno, pues definitivamente tratan a qué, pues tratan de subir. En los lugares donde hay problemas, digo problemas, una situación donde hay suelo contaminado con compuestos orgánicos volátiles, agua subterránea contaminada con compuestos orgánicos volátiles definitivamente la Agencia de Protección Ambiental Federal tiene que llevar a cabo una investigación para determinar si debajo de los edificios, estructuras, los vapores están saliendo del suelo contaminado o del agua subterránea y eventualmente están subiendo y se están acumulando dónde, debajo de las lozas, debajo del piso y también la Agencia de Protección Ambiental Federal toma muestras del aire del interior de estas estructuras para determinar si ha habido la

posibilidad de que ese contaminante que se haya estado acumulando, recuérdense cuando nosotros salimos al patio pues si hay contaminantes pues sale, el aire se lo llevo, pero si hay una estructura, qué hace ese contaminante, pues sube. Queda un poco atrapado, si fuera esta cancha aquí abajo pudieran haber contaminantes, si pasa al agua subterránea estos compuestos siguen subiendo se salen del agua siguen subiendo cuando llegan aquí, está cubierta este piso, quiere decir que se van acumulando. Si la estructura tiene grietas, tiene alguna apertura por la cual puede entrar ese contaminante, ese contaminante pudiera estar entrando a esa estructura. Para eso la agencia realiza este estudio. Este estudio de vapores del suelo se realizó en dos etapas, la primera etapa se tomaron muestras de dos estructuras, de dos estructuras, tres, dos estructuras ubicadas en el Parque Industrial El Retiro, específicamente donde estaba lo que conocemos y le estamos mencionando en el documento como el Former Baytex, el edificio que anteriormente estaba ubicada la compañía Baytex, donde se encontraron contaminantes concentración de vapores debajo de la loza de hasta 27,000 mg/m³, 27,000 mg/m³, entiendo que el nivel que levanta la banderita son como 94 (*ver diapositiva número 13 de la presentación: Investigación Remediativa: Resultado de Estudio de Vapores en el Suelo*). Por encima de los niveles que se levantaba la preocupación para llevar a cabo la investigación. En el lote o debajo del edificio donde está la compañía actualmente la compañía CCL se encontraron concentraciones de aproximadamente 7,100mg/m³, este 3 tenía que estar un poquito más arriba, se quedó abajo (*se refiere a un error en la presentación*). 7,100mg/m³, vamos bien, no. En Baytex, Former Baytex se encontró concentraciones hasta 27,000 mg/m³. La investigación, y hago un paréntesis aquí, la investigación que

se realizó la información que revela es que la propiedad donde está ubicada o donde estuvo ubicada lo que conocemos como el edificio de Former Baytex es un edificio, cuando se tomó muestra de suelo fueron por debajo de los límites que necesitaba algún tipo de acción y entendemos que los vapores que se encuentran debajo de la estructura son vapores que surgen del agua subterránea, que salen de la fuente, digo cuando digo fuente el suelo que está impactado, tanto en el área de CCL, el lote donde está CCL, donde está tricloroetileno, contaminante principal, como el lote donde está actualmente Wallace Silversmiths, donde el contaminante principal es tetracloroetileno. Cuando el agua subterránea sigue moviéndose pasa debajo del edificio pues suben estos vapores, bien.

Entonces, se muestrearon además aproximadamente treinta y una residencias, se pidió el acceso, ¿no? Tuvimos la cooperación de aproximadamente treinta y una residencias, dueños de residencias y pudimos hacer el estudio para determinar si se estaban acumulando vapores debajo del piso y si había concentraciones de estos vapores dentro de las casa por encima de unos niveles que ameritaban algún tipo de acción, ¿ok? La investigación reveló que todas las estructuras, todas las estructuras que se llevó a cabo muestreo dentro, las muestras tomadas dentro de la estructura, estoy hablando las dos en el Parque El Retiro y las treinta y una aproximadamente residencias que se tomaron muestras que estaban por debajo de los límites, que merecía algún tipo de... que levantara alguna banderita, que levantara algún tipo de banderita. No así en las dos propiedades que se llevó a cabo el muestreo, entiéndase Former Baytex y CCL, ya que en Former Baytex había 27,000 mg/m³ levantara una banderita, levantara una banderita. Recuérdense, independientemente de que haya

actualmente la presencia de estos vapores dentro de la estructura, el mero hecho de que haya unas concentraciones sumamente elevadas debajo de la estructura eso levanta una bandera, y máximo si la propiedad está ocupada quiere decir que hay que darle seguimiento. No quiere decir que la gente se está afectando, porque el aire dentro de la estructura hay unos parámetro establecidos donde se entiende que no debe haber un riesgo no aceptable, bien. Eso fue el primer "round" de muestreo. El segundo "round" de muestreo para "soil vapor extraction", para los vapores en el suelo, los vapores debajo de la estructura se incluyó, en el Parque Industrial se incluyó el lote o la estructura donde está operando actualmente la compañía Wallace, se incluyó Former Baytex se incluyó de nuevo, CCL se incluyó de nuevo y se incluyeron aproximadamente siete residencias, siete residencias. De todas las demás se repitieron dos, dos residencias y se incluyeron aproximadamente 5 a ser residencias. Anteriormente, en el primer "round" de muestreo habían habido dos residencias que debajo del piso tenían unas concentraciones que demostraba que se estaba acumulando un poco de vapor, se estaba acumulando un poco de vapor, pero entiéndase el aire en el interior de todas estas residencias, de todas las residencias estuvieron por debajo de los límites que pueda causar algún tipo de riesgo no aceptable. Quiere decir que estaba dentro de lo permitido. Con relación al lote, a los lotes muestreados en el Parque Industrial pues definitivamente en el Former Baytex se detectó prácticamente la misma concentración (*ver diapositiva número 13 de la presentación: Investigación Remediativa, Resultados de estudio de Vapores en el Suelo*). Anteriormente eran como 27,000, después fue aproximadamente 23,000 mg/m³, en CCL anteriormente habían sido como 7,000 se detectó como 8,000

prácticamente en el mismo, en el mismo rango. En la estructura donde está actualmente la compañía Wallace, que fue muestreada por primera ocasión, entiéndase eso se toman muchos puntos, muchos puntos de investigación. Se encontraron concentraciones, la concentración mayor fue de aproximadamente de 726,000 o 732,000 mg/m³. Actualmente la Agencia de Protección Ambiental Federal está en conversaciones, está en trámites para tomar algún tipo de posible acción para tratar de mitigar, tratar de mitigar el potencial o la probabilidad o reducir cualquier probabilidad, bien, estamos, seguimos.

El agua subterránea, el agua subterránea, esta transparencia prácticamente la habíamos mencionado anteriormente (*ver diapositiva número 14 de la presentación: Investigación Remediativa, Resultados de Estudio de la Contaminación del Agua Subterránea*). Cuando se hicieron los barrenos se recuerdan que en las facilidades donde está Wallace actualmente, el lote donde está Wallace se había detectado hasta 46,000 partes por billón en suelo, pero cuando se hacen los barrenos, se estaban haciendo los barrenos cuando se tocó el agua se llegó al agua, se tomó muestra y se detectó 7,960 mg por litro de tetracloroetileno. Lo que significaba que seguía reforzando los hallazgos de que en el lote de Wallace el contaminante principal es tetracloroetileno, y el contaminante principal en el lote de CCL es tricloroetileno. Como parte de la investigación del agua subterránea, se hicieron aproximadamente, esto se conoce como unos transeptos, entiendo yo como diez u once aproximadamente. Aproximadamente como diez u once transeptos, transeptos son barrenos que se hacen prácticamente en línea desde la posible fuente. Ustedes ven estos puntitos por aquí son barrenos que se hicieron para tomar muestras (*ver diapositiva número 16 de la*

presentación: Investigación Remediativa, Agua Subterránea), unas muestras del agua subterránea y aquí se pudo ver, se pudo comprobar las concentraciones. Los cuadritos en amarillo significan que exceden los 5 partes por billón. Se pudo definir claramente y ver un movimiento, un movimiento desde el Parque Industrial El Retiro, específicamente estos dos lotes que mencionamos anteriormente, en dirección a dónde. En dirección a los pozos que fueron impactados. Con concentraciones mayor en el caso del lote de CCL. Aquí está el lote de CCL a la parte de atrás, concentración de 65,000 partes por billón. En el lote donde está ubicado actualmente Wallace se encontró la concentración máxima de tetracloroetileno con una concentración de 26,000, aproximadamente 26,000 partes por billón, y de ahí en adelante pues se pudo ver un patrón, un patrón de movimiento del contaminante, ¿no?, del contaminante hacia en esta dirección (*ver diapositiva número 17 de la presentación: Investigación Remediativa, Agua Subterránea*). Sumamente importante, la porción del agua subterránea, específicamente la acción relacionada a esta parte del agua, a esta parte del agua subterránea contaminada va a ser parte, o va a ser la acción que esperamos nosotros para septiembre del próximo año, del próximo año estar atendiendo. Estamos atendiendo en este momento la fuente de contaminación para tratar de evitar que el contaminante, que el contaminante que está en el suelo, en el suelo saturado o suelo no saturado, que ese contaminante siga saliendo, porque aquí están las concentraciones mayores, 65,000 de tricloroetileno, 26,000 de tetracloroetileno y queremos atender para tratar de evitar que ese contaminante se siga moviendo y atender la fuente de la forma más rápida posible, para que se siga remediando, se siga remediando estos lotes. Tenemos por aquí como parte de la investigación de agua

subterránea, se hincaron diez pozos de monitoreo, para tomar muestras del agua subterránea. Esto pues aquí está la información y revelan prácticamente lo mismo. Un movimiento, una tendencia del agua subterránea moviéndose en esta dirección. Sumamente importante, en este momento el agua subterránea estaba, mostraba tendencia en esta dirección. Entendemos que cuando estaban en operación los pozos El Retiro, Lola I y Lola II, pues definitivamente estaban halando el agua, creaban un cono, un cono de influencia y halaban el agua hacia ellos. Aquí tenemos al norte, al norte tenemos el Río Guamanino, Guanajibo, el Río Guanajibo, me confundí allá, estoy con Guayama. El Río Guanajibo tenemos el Río Guanajibo, entendemos que eventualmente el agua cuando no hay acción moviéndolo hacia en una dirección noroeste pues eventualmente el agua pudiera tratar de tender o tender moverse hacia dónde. Quiere decir que nuestra investigación, que continuamos haciendo la investigación pues estaremos obteniendo una información que nos hace falta para poder eventualmente tomar y establecer cuál sería la acción para remediar el agua subterránea. Definitivamente el agua subterránea tiene altas concentraciones y entendemos que definitivamente cuando se haga el avalúo de riesgo, pues debiera estar indicando que hay que tomar una acción para el agua subterránea, pero eso es el objeto de otra acción que estaremos tomando el año próximo.

Aparte de la investigación del agua subterránea, el suelo, los vapores, la Agencia de Protección Ambiental Federal también tomó muestras del agua superficial, así también como de sedimento (*ver diapositiva número 18 de la presentación: Resultados de Estudio de la Contaminación del Agua Superficial*). Aquí tenemos el Río Guanajibo. Se tomaron muestras a aguas de superficie, sedimento del Río Guanajibo. Estamos

bien allí, o sea aquí no vemos contaminantes. Recuérdense que en la tablita los cuadritos amarillos es donde hay contaminación. No así, uno drenajes que está entre el edificio donde está actualmente la compañía CCL y la compañía donde estaba anteriormente Former Baytex, aquí hay como un canal. Un canal que pasa hacia allá, se mueve hacia allá en dirección norte y ahí se encontraron contaminantes que entendemos pues son. Aquí tenemos tricloroetileno, el contaminante principal tricloroetileno. Entendemos que las altas concentraciones que están en esa zona pues son las causantes de que haya habido un impacto en el agua superficial de esos drenajes (*ver diapositiva número 19 de la presentación*). Aquí podemos ver específicamente donde se encuentra actualmente Wallace, donde está CCL y Former Baytex. Aquí podemos ver, yo les mencioné anteriormente que había cinco áreas donde se detectó la presencia mayor de contaminantes que hace falta tomar una acción remediativa. Aquí tenemos el área, vamos a decir en la zona 1, zona 2, zona 3, donde está ubicado actualmente la compañía Wallace, el lote donde está actualmente la compañía Wallace, entiéndase estas propiedades, lotes. En este caso estos tres lotes están actualmente estas compañías pero estos lotes son propiedad del Gobierno de Puerto Rico, de Fomento Industrial, la compañía de Fomento Industrial. Actualmente pues están estas compañías, en el pasado hubo otras compañías que estuvieron operando en esos lotes y la Agencia de Protección Ambiental Federal pues ha estado recopilando información en relación al tipo de operación que llevaron a cabo estas compañías y están en conversaciones con las compañías que actualmente están allí. Quiere decir que eventualmente la Agencia pues se reunirá con todas estas compañías y se dialogará acerca de las acciones que tienen que llevarse a cabo y

cómo se estarán llevando a cabo este tipo de acción. En el lote donde está CCL, pues podemos ver dos áreas, 1 y 2. Siendo el área 2 y el área 5. Esta es la 2. 1, 2, 3, 4 y 5; el área 2 y el área 5 las áreas donde se encontró la mayor concentración en aguas subterráneas, bien.

Se llevó a cabo un avalúo de riesgo (*ver diapositiva número 20 de la presentación: Resumen de Riesgo en el Lugar*), en ese avalúo de riesgo pues se evaluaron diferentes escenarios. Escenarios de qué sucedería, los trabajadores que estén actualmente que están en la facilidad, residentes, uso recreacional, personas que puedan ingresar, trabajadores de construcción en el futuro pudieran estar llevando a cabo algún tipo de actividades. Luego de haberse llevado a cabo el estudio entiéndase que cuando se llevó a cabo este estudio se detectaron unos metales, se detectaron unos metales pero el estudio indica que las concentraciones presentes de estos metales son concentraciones naturales que existen en el área. Es que los contaminantes de preocupación o sí de preocupación en este caso que estamos atendiendo la fuente es tetracloroetileno y tricloroetileno, son las contaminantes principales con sus otros productos que surgen como consecuencia de estos productos principales.

El resumen del avalúo del riesgo que se llevó a cabo indicó que es necesaria una acción remediativa para proteger la salud pública, el bienestar y el medio ambiente de la amenaza impacto actual al agua subterránea (*ver diapositiva número 20 de la presentación: San Germán Groundwater Contamination Site*). Recuérdense actualmente hay suelo contaminado o ha habido suelo contaminado que ha estado impactando el agua subterránea. Por eso fue que se impactó los pozos Retiro. Quiere decir que la Agencia de Protección Ambiental Federal con de acuerdo con la Junta de

Calidad Ambiental, en acuerdo con la Junta de Calidad Ambiental entienden que es sumamente necesario tomar una acción para tratar de evitar que esos contaminantes sigan pasando del suelo al agua subterránea y así también minimizar el potencial o el riesgo de que estos contaminantes pasen del suelo o la zona llana donde está el agua, donde comienza a haber el agua pase a vapores, y eventualmente haya ese potencial o esa preocupación de que pueda estar impactando a las estructuras o a las personas que habitan o trabajan en estas estructuras, bien. Objetivos de la acción remediativa (*ver diapositiva número 22 de la presentación: San Germán Groundwater Contamination Site*) que se estará llevando a cabo, hay dos áreas. Uno el suelo, prevenir o reducir que los suelos contaminados actúen como fuente de contaminación del agua subterránea, por eso hay que tomar acción, hay que tomar acción. Dos, reducir que la masa de contaminantes en la zona saturada de suelo, lo que se conoce la saprolita actúe como fuente de contaminación del agua subterránea, por eso estamos atendiendo la fuente, entiéndase zona de suelo no saturada y donde comienza ya a haber el acuífero. Estamos hablando aproximadamente hasta treinta y cinco pies yo creo, treinta y cinco, quizás cuarenta, las zonas llanas que es la zona mayormente afectada. Entendemos que al tratar el suelo remover estos compuestos orgánicos volátiles por la alternativa que estamos recomendando pues evitará o reducirá el potencial de que estos contaminantes pasen al agua subterránea. Así también reducirá el potencial de que esos contaminantes sirvan como fuente de esa generación de vapores que eventualmente se acumulan en el edificio y pudiera haber el potencial o la probabilidad de que eventualmente pudieran acceder al interior de estos edificios. Entiéndase, se está tomando, actualmente hay unas conversaciones para tomar unas

acciones dirigidas a estos vapores que están debajo en estas dos lotes principales que estamos mencionando, estructuras. Hay unas conversaciones para tomar algún tipo de acción lo antes posible, ¿no?, para tratar de atender esos vapores, bien. Eventualmente, la Agencia de Protección Ambiental Federal en su investigación que continúa pues estará siguiendo atendiendo, atendiendo y la acción que se esté tomando ahora va a hacer, lo que se haga con relación a la mitigación de los vapores que hay debajo de estos pisos, de estos edificios. Cuando digo edificios, los dos que mencionamos anteriormente. La acción que la Agencia tome en estos momentos va a ser cónsona. Ambas acciones van a ser cónsonas con la acción, con la remediación de estos vapores, suelos y vapores que están en estos dos lotes, bien.

Se evaluaron cuatro alternativas. Aquí podemos ver cuatro alternativas (*ver diapositiva 23 de la presentación: Alternativas Remediativas IDC*) La alternativa número 1, incluida en el record, en el documento que se conoce Estudio de Viabilidad, es la alternativa de no acción (*ver diapositiva 24 de la presentación: Alternativa S1 No Acción*). Recuérdense, independientemente que nosotros sepamos que hay que tomar una acción, por ley tenemos que considerar qué sucedería si no se toma acción, y definitivamente si no se toma pues sigue la contaminación, la contaminación se sigue expandiendo. El contaminante del suelo sigue llegando al agua subterránea y estas altas concentraciones que están en un área localizada pues definitivamente mientras más se expanda pues más difícil va a ser eventualmente qué, el remediarlas, bien. La segunda alternativa que se consideró fue la excavación y disposición fuera del lugar y tratamiento en el lugar. Cuando hablamos de excavación, todas estas alternativas con excepción de la primera, hago la salvedad, la dos, la tres y la cuatro incluyen como

parte de sus componentes, uno que se establezcan unos controles institucionales. Lo que se conoce como "dig restriction", una restricción, unos gravámenes en el título de propiedad donde diga "mira no me excaves el terreno porque aquí este terreno está contaminado", para evitar que se excave el terreno, para evitar que se hingue un pozo y extraiga agua de esa área que está impactada. Quiere decir que Agencia de Protección Ambiental Federal a través del Gobierno de Puerto Rico, la Junta de Calidad Ambiental y agencias del Gobierno de Puerto Rico pues estarán estableciendo unos mecanismos para tratar de evitar que las áreas afectadas sean impactadas. Estamos claros con eso. Aparte de eso, la dos, la tres y la cuatro también requieren como se permanece un contaminante por equis periodo de tiempo en lo que se remedia, de que cada cinco años luego de que comience la acción de remediación se lleva a cabo una evaluación para determinar si la acción que se está llevando a cabo, independientemente cual sea, la dos, la tres, la cuatro, se esté llevando correctamente, bien. Regresando a la número dos, número dos es excavación y disposición fuera del lugar, tratamiento en el lugar (*ver diapositiva 25 de la presentación: Alternativa S2 Excavación y Disposición fuera del lugar/Tratamiento en el Lugar*). Les mencioné anteriormente que había cuántas áreas, cinco áreas, ¿se recuerdan? Tres en el lote donde se encuentra Wallace, dos en el lote donde se encuentra CCL. Todas estas alternativas, la dos, tres y la cuatro hay diferentes componentes. En el caso de excavación, pide que la excavación sea, aquí tenemos la figura, ¿no?, que la excavación sea hasta aproximadamente, hasta aproximadamente trece pies, hasta aproximadamente trece pies, en el uno, en el dos y en el tres. Les estoy mencionando las alternativas y luego les diré la que la Agencia está recomendando. Excavación, tú

sabes, hasta trece pies recuérdense para excavar posiblemente hay que estar trabajando en esta porción dentro del edificio, ¿no? y la Agencia pues considera eso. En su documento reconoce el impacto que esto puede causar, que esto puede causar. Hay nueve criterios que la Agencia compara, estas alternativas. Le estoy diciendo lo que conlleva, lo que conllevaría. Pues, recuérdense cuando estamos hablando de las áreas que están aquí en amarillito, diagonales amarillo, aquí. Luego que se firme el record de decisión, se entra en comunicación, se firma un acuerdo por consentimiento para llevar a cabo los trabajos de remediación. Se tiene que llevar a cabo el diseño de cualquier tipo de acción. Durante la parte de diseño se va a tener que hacer qué, se va a tener que llevar a cabo un muestreo para poder definir claramente hasta donde llega el área que habría que estar trabajando. Quiere decir, conlleva excavación. Posteriormente se retornaría, se echa terreno limpio, se echa terreno limpio, se compacta, se compacta, también incluye si hay terrenos que exceda los límites establecidos, que indique que el terreno tiene unas características de peligrosidad habría que disponerlo en Estados Unidos. Posteriormente tratamiento en el lugar. Tratamiento en el lugar lo que significa es que se le añaden unos aditivos orgánicos en el terreno a diferentes profundidades, esto es para incentivar la actividad de las bacterias porque las bacterias allá siguen trabajando con ese contaminante y lo van eliminando, para que se pueda biodegradar. Tratamiento en sitio, esa es la alternativa número dos.

La alternativa número tres, que es la alternativa que la Agencia de Protección Ambiental Federal con la Junta de Calidad Ambiental están recomendando es la alternativa que conlleva extracción de vapores del suelo (*ver diapositiva 26 de la*

presentación: Alternativa S3 Extracción de Vapores del Suelo y Extracción en interfaces / Tratamiento en el lugar). Recuérdense se hincan una serie de pozos, una serie, como una serie de pozos, ¿no?, eso es para extraer, un sistema para extraer los vapores que se están generando, extraen los vapores, esos vapores se sacan a la superficie. Se capturan en un sistema, un sistema de carbón activado, se capturan y también incluye una extracción en interface. Lo que se conoce como “dual phase”. Recuérdense estábamos hablando que hay una porción de terreno, posiblemente no sé dieciocho, veinte pies aproximadamente de terreno que no tiene agua. Aquí estarían los pozos de “soil vapor”, hay una porción que ya comienza el agua, que ya comienza el agua, ahí sería extracción de agua, extracción de agua, el agua se saca de la superficie, se trataría en un sistema de tratamiento, un sistema de tratamiento. Eventualmente, pues se descargaría el agua tratada cumpliendo con los parámetros establecidos, recuérdense estas acciones tienen que cumplir con todas las leyes que aplican. Eso estamos claro con ello, y posteriormente incluye el tratamiento en el lugar. El tratamiento en el lugar, el tratamiento en el lugar, bien. Cuando hablamos de sistema de extracción de vapores estamos hablando de estos tres. Uno dos, tres, extracción de sistema de vapor, extracción de vapores de vapor, en la dos incluye “dual phase”, “dual phase” es que el agua, aquí se va a tratar agua, agua. Aquí en el área de CCL, aquí incluye “in situ treatment”, pero aquí en el área número cinco, que fue el área donde se encontró la alta concentración de 65,000 partes por billón, ahí incluye el “dual phase” también. “Dual phase” y después “in situ treatment”. Cuando hablamos de este sistema de remediación, la alternativa número tres, y luego lo van a estar viendo en una tablita incluye que el sistema de extracción de vapor va a estar aproximadamente,

se entiende que dos años continuos, el "soil vapor". Dos años, e intermitente por los próximos ocho años, para un total de 10 años, aproximadamente. Durante la fase de diseño se tiene que refinar, se tiene que refinar este sistema. La alternativa número cuatro es tratamiento termal, y extracción de vapor y tratamiento en el lugar. Tratamiento termal significa que hay unos sistemas que calienta, ¿no?, que calientan, que calientan esa área donde están esos compuestos, y ahí genera calor y esos compuestos orgánicos volátiles que hacen, pues se van a vapor, ¿no? Los que están en agua o están en suelo se liberan y salen y el sistema de vapor los atrapa. Es mucho más difícil de implementar, es mucho más difícil, más complicado. Requiere un espacio mayor para ser implantado. Estos son los costos asociados, están en su documento (*ver diapositivas 23 a la 26 de la presentación: San Germán Groundwater Contamination Site*). No acción pues no conlleva costo. La alternativa número dos es una alternativa que el costo, ves, aquí tenemos aproximadamente cuando se redondea la operación y el mantenimiento con el costo capital son aproximadamente \$13.4 millones, tiempo de construcción de doce a dieciocho meses, tiempo de implementación 2.5, pero el costo es \$13.4 millones. La alternativa número tres tiene un costo, cuando añadimos costo de operación y mantenimiento, costo capital de aproximadamente \$7.3 millones. \$7.3 millones y dice tiempo de operación aproximadamente diez años, les mencioné anteriormente que la operación del sistema de extracción de vapores se entiende que son dos años continúa, y de una forma intermitente aproximadamente ocho años más, para un total de aproximadamente 10 años. Tiene un costo de \$7.3 millones. La alternativa número cuatro pues tiene un costo de aproximadamente \$13.3 millones (*ver diapositiva 27 de la presentación:*

Alternativa S4 Tratamiento Termal en el Lugar y SVE / Tratamiento en el Lugar).

Cuando se evalúa esta alternativa y eventualmente ustedes van a ver que aquí tenemos los nueve criterios por los cuales la Agencia de Protección Ambiental Federal, la Junta de Calidad Ambiental comparan todas estas alternativas. Están en el documento que ustedes tienen (*ver diapositiva número 28 de la presentación: Criterios para la selección de la acción remediativa bajo CERCLA*). Recuérdense, no necesariamente una alternativa por costar más quiere decir que va a ser la más efectiva, o la más costo efectiva. Costo efectiva significa que lo que yo alcanzo por la inversión de dinero que yo estoy haciendo, si yo con \$7 millones alcanzo mi objetivo de llegar a los niveles de limpieza que yo estoy obteniendo en vez de \$13 millones, ustedes dicen pues esta es más costo efectiva. Este no es el único criterio, aquí no es dinero el criterio, aquí es uno de los criterios, porque hay otros criterios, como por ejemplo es la implantación. ¿Cuán factible? El efecto que tiene a corto plazo, el efecto que tiene a la operación de las facilidades que están ubicadas allí o sus alrededores. Todo esto la Agencia de Protección Ambiental Federal lo toma en consideración, toma en consideración estas alternativas pueden lograr con los objetivos de limpieza, los estándares establecidos y así sucesivamente. Reducción de la toxicidad, de la movilidad, del volumen, efectividad a corto plazo, el efecto que puede tener a corto plazo, la implantación, la interrupción que pueda tener, todos los efectos que puedan tener. Uno de los elementos que es el elemento número ocho, que es la aceptación de la agencia estatales, la Agencia de Protección Ambiental Federal antes de someter este documento a comentario público en agosto 12, recibe, tiene que recibir una carta del Gobierno de Puerto Rico, a través de la Junta de Calidad Ambiental. En este caso

recibió una carta donde la Junta de Calidad Ambiental, el Gobierno de Puerto Rico a través de la Junta de Calidad Ambiental endosa la alternativa propuesta por la Agencia de Protección Ambiental Federal, que es la alternativa número tres. Estamos en este momento en un periodo de comentario público de treinta días, termina en septiembre 11 donde eventualmente, aquí está, se está cumpliendo el criterio que, el criterio número nueve. La alternativa que está proponiendo, la que mencioné anteriormente, la alternativa número tres (*ver diapositiva número 29 de la presentación: Plan Propuesto*). Entiéndase los trabajos de investigación no terminan con la toma de esta decisión. La Agencia de Protección Ambiental Federal, la Junta de Calidad Ambiental continuamos investigando y tomando las acciones necesarias, las acciones necesarias para salvaguardar y proteger nuestro medio ambiente, y sobre todo la salud de quién, la salud de las personas, que eso es lo más importante. Recuérdense cuando hablamos de salud, le digo doy clase en la Escuela de Medicina de Ponce, Universidad de Ciencias de la Salud. El problema de la salud pública, cuando hablamos de salud no es simplemente ausencia de enfermedades, conlleva un espectro muchísimo mayor. Eso es lo que estamos buscando. El periodo de comentarios lo mencionamos anteriormente (*ver diapositiva número 30 de la presentación: Periodo de Comentarios*), aquí tienen la información mía, estamos a sus órdenes en la Agencia de Protección Ambiental Federal. Tenemos por aquí los lugares donde se encuentran los documentos, la alcaldía, la oficina de la alcaldía, la Agencia de Protección Ambiental Federal en Guaynabo, la Junta de Calidad Ambiental, la oficina en Nueva York (*ver diapositiva número 31 y 32 de la presentación: Repositorios*). Queremos agradecer al equipo completo de trabajo, cuando hablamos del municipio de San Germán, hablamos

completo, lo principal aquí son los residentes. Sin los residentes, el aporte de los residentes, no hubiese sido posible esta investigación. Miren, aquí yo me tomé cafecito, juguito, arroz con dulce, galletitas, etcétera, etcétera, porque uno va allí y vienen los residentes de aquí son buenísimos. Al Sr. Alcalde, a todo su personal, queremos agradecer. Queremos agradecer también a la Junta de Calidad Ambiental. A todo el personal de la Agencia de Protección Ambiental Federal por toda la ayuda, que hicieron posible la realización. Las compañías que nos ayudaron en la realización de esta investigación. ¿Preguntas?

Brenda Reyes: Les pido que para preguntas digan su nombre para el record, ya que tenemos aquí a la transcripción, así que si hay alguna pregunta pues este es el momento. Sí.

Cándido Rodríguez: Sí, buenas noches.

Brenda Reyes: Buenas noches.

Cándido Rodríguez: Mi nombre es Cándido Rodríguez. Fui residente de esta Urbanización unos años, luego me fui para la zona metropolitana y actualmente estoy cuidando a mi mamá en esta misma calle. Voy a decir que soy ingeniero industrial, porque por ahí va a partir mi pregunta. Cuando yo empecé la industria hace unos treinta años en el norte de la isla, trabajé con una compañía que se utilizaba este tipo de solvente para limpiar piezas electrónicas. Específicamente en el área de Vega Alta, esas piezas que se limpiaban con este solvente era para volverlas a utilizar y lamentablemente en esa época y en esa zona ese solvente una vez ya no se podía utilizar porque era reusable hasta que se llenaba de grasa y ya no podía utilizarse, se disponía de la siguiente manera. Los “drones” se sacaban al terreno, se tiraban a la

tierra y la tierra se encargaba de disponer de ella. En el área de Vega Alta lamentablemente para esa época, había cerca de nueve pozos que se utilizaban por Acueductos para extraer agua y procesarla y utilizarla en el pueblo. Lamentablemente se identificó con el tiempo que cinco de esos pozos tuvieron que ser cerrados porque estaban contaminados. Con los años la investigación determinó que tres de las compañías incluyendo la que yo trabajaba pues fue "liable", responsable por esta situación. Se hicieron estudios de suelo y se determinó cuáles fueron y se pusieron unas multas increíbles a las tres compañías, que solamente una de ellas está allí. El área de Vega Alta se identificó como con una alta incidencia de cáncer en las personas. Obviamente no sé si se ha dicho, porque llegué un poquito tarde, que estos solventes son carcinógenos. Una de las preguntas es: ¿se ha hecho algún estudio en el área de San Germán si la incidencia de cáncer ha aumentado en el período en que ocurrió esta situación? porque yo entiendo que esos tres pozos que están actualmente fuera de operación en algún momento se utilizó el agua por Acueducto. No sé si se trató o no se trató el agua, y si esa agua llegó hasta, hasta los seres humanos y fue consumida. Si ese estudio ustedes lo tienen contemplado mirar o si se miró y cuáles son los resultados, porque por lo que yo he podido ver la problemática va mucho más allá de lo que se está exponiendo aquí y no los estoy acusando de nada pero pienso que es un problema real, es un problema que va a afectar el futuro y está afectando el presente de esta urbanización, porque ustedes identificaron unos pozos que posiblemente las personas los han estado utilizando por años y podría haber estado causando a ellos o a sus vecinos, que algunos casos se sirvieron de esa agua, mayores problemas como cáncer o enfermedades mayores.

Adalberto Bosque: Bien. Gracias por su pregunta. La pregunta suya queda anotada en el documento y eventualmente se puede elaborar un poco más en la contestación. Nosotros en este momento no tenemos información con relación a prevalencia. Por lo menos yo no tengo, tendría que verificar eventualmente en la oficina de Nueva York, ¿no? Si hay información con relación a prevalencia de cáncer, lo que sí podemos decir es que cuando existen pozos que son utilizados para abastos de agua potable, independientemente que sea un pozo, que sea manejado por la Autoridad de Acueductos y Alcantarillados o sea un pozo de un sistema que se conoce como non-PRASA. El Departamento de Salud, que es utilizado para abastos de aguas potables, el Departamento de Salud interviene. Cuando digo interviene, el Departamento de Salud requiere por ley que se lleve a cabo cierto análisis, cierto muestreo de ese pozo. En este caso de los pozos que nosotros estamos mencionando, y estoy mencionando los pozos de Acueductos, bien. En el caso de Acueductos, los pozos Lola 1y Lola 2 y El Retiro, pues definitivamente tenían que cumplir y cumplían con el requisito del Departamento de Salud y se muestreaban, periódicamente se le toman muestras. Por eso la información cuando la Agencia de Protección Federal incluye un lugar en la Lista Nacional de Prioridad hay varias etapas. La primera etapa, la primera etapa es, es la etapa donde la Agencia de Sustancias Tóxicas y Registro de Enfermedades conocida como ATSDR. ATSDR lleva a cabo un estudio, como si fuera un avalúo de riesgo. Es cualitativo, no es cuantitativo, que dice pues mira cuál es la información, cuáles son las concentraciones. La información que nosotros recopilamos y obtuvimos a través de todas las agencias, todas las investigaciones que se realizaron, llevaron a cabo, indicaban que en ese momento la concentración mayor, entiéndase del 2001 al 2005

aproximadamente, un periodo de tiempo. Se había detectado la presencia de compuestos, se estaba detectando, ¿no? No fue hasta que llegó un momento que excedió ese límite donde el Departamento de Salud le indicó. Los resultados son enviados al Departamento de Salud y el Departamento de Salud qué le dice: “cierra el pozo”. Los pozos de Acueductos, la información que tengo y está en el documento que eran, creo que son aproximadamente, no sé si eran 8,000 o 16,000 personas, provee la cantidad de personas que eran servidas, que eran servidas, se discontinuó la operación de esos pozos. Estamos claros, estamos bien hasta el momento. Importante, hizo una pregunta, hizo una pregunta porque en este caso algo que nosotros hemos tratado de pasar la voz y seguimos en colaboración con el Municipio y con el Departamento de Salud y con el Departamento de Recursos Naturales, es que la información que nosotros tenemos. La información, por lo menos aquí tuvimos una reunión de disponibilidad con la ciudadanía, hemos tenido una o dos reuniones aquí en este lugar y hemos repartido información y hemos visitado algunas casas, de que para los años setenta, para los años setenta, setenta y pico hubo una situación que hubo una necesidad de agua, no sé si era con un huracán o una inundación... setenta y cinco, la tormenta Eloísa. Sucedió ese evento que hubo la necesidad de una necesidad de agua. Cuando digo necesidad de agua que Acueducto, el agua de Acueducto no venía, aparentemente se discontinuó, pasó algo que no había. Según la información que nosotros tenemos, un grupo de residentes no sé si fue que se unieron o algo así. Ellos hincaron unos pozos, hincaron unos pozos. Nosotros como parte de la investigación hemos tratado de determinar y de identificar pozos que existan en el área. Nosotros identificamos siete pozos, en las reuniones que nosotros hemos tenido

aquí, hemos identificado... bueno y tuvimos acceso. Tuvimos acceso a siete, a ocho pozos. El primer pozo que muestreamos, en un pozo de los que muestreamos que lo cerraron, que lo cerraron, se detectó contaminantes por encima de los 5 partes por billón. De los otros siete pozos que muestreamos, si mi mente no me falla, dos pozos detectaron por encima de los 5 partes por billón. Cuando dialogamos con las personas, las personas nos dicen, "yo no utilizo el pozo, el pozo para lo único que lo utilizo es para regar las matas, etcétera, etcétera". Como quiera que sea a las casas donde nosotros muestreamos los pozos le llevamos unas cartas, fuimos allá a las casas y les llevamos unas cartas donde le decíamos "estos son los resultados, su pozo excede este valor, por lo tanto le recomendamos que no lo utilice", y aunque no excediera le estamos diciendo "recomendamos que no lo utilice, que no lo utilice". Entiéndase también y con esto hago el otro punto, viene una parte y es bien importante que nosotros tenemos que seguir trabajando con el Municipio y con el Departamento de Recursos Naturales. No sabemos cuántos pozos hay. Hay veces que uno va a la casa, que uno va a la casa, y aquí hay personas de la compañía CDM que la compañía que le hace el trabajo de campo a la EPA, y van a las casas. Se va a la casa y le dice "mira yo vengo aquí a ver si tú tienes algún pozo privado, porque me gustaría si lo tienes te lo muestreo de una forma gratuita y te doy los resultados, o sea yo no te estoy penalizando porque ese no es el trabajo de la EPA". La EPA no le va a decir "cierra el pozo", no, la EPA lo que quiere decir es "te tomo muestra del pozo de una forma gratuita y te doy los resultados para que tú sepas la calidad". Hay personas que le dicen a uno "no, yo no tengo pozo". No estoy diciendo que tengan o no tengan, entendemos nosotros que hay más, posiblemente más de siete pozos. Nosotros

estamos en conversaciones, o nos hemos reunidos, nos reunimos ya con el Departamento de Salud, específicamente el Director del Programa de Agua Potable, el Ingeniero Javier Torres, ya nos reunimos con él y estamos haciendo otras reuniones. Yo creo que se lo había mencionado al Sr. Alcalde que tenemos que hacer ese tipo de reunión y con el Sr. Nelson Velázquez, subsecretario de Recursos Naturales de Permiso y Franquicia porque tenemos que ver de qué forma u otra se chequean. Hay personas que le dicen a uno “no tengo pozo” cuando en la realidad tienen. En la parte de aguas subterráneas se va a hacer el avalúo del riesgo, y eventualmente se dice si el riesgo excede el riesgo de cáncer es por encima de lo aceptado. Es de 1 en 10,000 a 1 en 1,000,000, lo aceptado, si se excede la probabilidad de exceso de cáncer, así se llama. Si se excede a la probabilidad de exceso de cáncer, si existe o no la prevalencia de cáncer eso entiendo yo que lo pudiéramos, yo entiendo que se puede conseguir porque yo entiendo que a través del Departamento de Salud, ellos tienen las estadísticas. Es buen punto, lo pudiéramos tratar de conseguir. Se le agradece su comentario, un comentario válido. Bien, ¿alguna otra pregunta?

Recuérdense como mencioné anteriormente la información de nosotros está en el documento. Cualquier información. Nosotros trajimos unas cartas que son unos sobrecitos amarillos que tienen los resultados de las casas donde tomamos el muestreo de los vapores. Para los que estuvieron aquí, si no mañana yo voy a venir aquí y los voy a entregar, y si no, pues coordinamos con el municipio de qué forma le podemos hacer llegar esas cartas y eventualmente pues seguiremos nosotros tratando de hacerles llegar este mensaje a la ciudadanía, que nosotros estamos aquí para ayudar. Entiéndase, para ayudar, para tratar de determinar si existe algún, no quiere

decir que porque haya un contaminante quiere decir que va a haber problemas. Puede haber una concentración no necesariamente va a haber un exceso de cáncer por encima de los límites. ¿Alguna otra pregunta? Sí, y después usted.

Cándido Rodríguez: ¿Quién va a asumir el costo de....?

Adalberto Bosque: El nombre, si me hace el favor.

Cándido Rodríguez: Cándido Rodríguez, nuevamente. ¿Quién va a asumir el costo? y si se le va a asignar alguna responsabilidad a estas compañías que algunas están todavía operando y otras no están operando, pero me imagino que se pueden contactar y si son responsables se les debe, deben asumir responsabilidad.

Adalberto Bosque: Bien, buena pregunta. El procedimiento que sigue la Agencia de Protección Ambiental Federal que está avalado por la ley, que le da la autoridad a la Agencia de Protección Ambiental Federal cuando tiene conocimiento de un lugar contaminado la Agencia trata de identificar partes responsables. Digo, partes responsables, pudiera ser la compañía que causó la contaminación, el que está operando, el dueño del lugar y entra en unas conversaciones, entra en unas conversaciones. No le estoy diciendo que todo eventualmente van a pagar, van a haber unas conversaciones y si se identifica antes de comenzar la investigación pues la Agencia va donde ella y le dice: "quiero que pagues". O un acuerdo por consentimiento a una orden unilateral, o pudiera ser que la Agencia diga "en esta etapa del proceso yo quiero recopilar un poco más de información para determinar exactamente hacia donde yo voy dirigida", y la Agencia eventualmente identifica, o sea la Agencia costea. Estos son trabajos que valen millones de dólares, son trabajos que valen millones de dólares. La Agencia lleva a cabo la investigación, recopila la información y después dice

“vénganse para aquí todas las compañías”. Recuérdense, cuando estamos hablando, en este caso mencionamos unas compañías, pero hicimos la salvedad de que aparte de estas compañías anteriormente había otras compañías. Quiere decir que la Agencia, su abogado o su personal está investigando y va a traer en un momento, notifica a todas, les envía cartas, recopila información suficiente para eventualmente sentarse a la mesa de negociación y decirle “aquí está el trabajo, yo he invertido equis cantidad de millones”, la limpieza de una parte, recuérdense que esto es solamente en la fuente, la fuente son siete, la remediación no la investigación. La remediación \$7.3 millones. “Vamos a sentarnos, tengo suficiente información, vamos a firmar”. Las compañías tienen dos opciones, por consentimiento o que la Agencia eventualmente vaya contra ella. La Agencia tiene la autoridad para cobrarle hasta tres veces la cantidad que la Agencia ha invertido. Tiene la autoridad, quiere decir que la Agencia cuando hay compañías. La Agencia va, va a buscar el que le pague lo invertido. Digo lo invertido, no dije lo gastado porque esto es inversión, porque es beneficio a la salud y eventualmente el dinero de la remediación, ¿qué estamos hablando? \$7.3 más lo invertido en la investigación, más el costo de la remediación que va a ser el agua subterránea, que yo asumiría que pudiera ser mucho mayor de que la remediación del agua, de la fuente de remediación.

Brenda Reyes: Yo voy a poner... Voy a intervenir aquí para contestar su pregunta. Recientemente terminamos trabajo en un lugar de Superfondo en el pueblo de Vega Baja, donde las compañías lo que se hizo fue un grupo donde estaban las partes potencialmente responsables que fueron identificadas luego de un largo proceso, eso incluyó agencias de gobierno, o sea no solamente son empresas. Hay agencias de

gobierno que pueden estar involucradas como partes potencialmente responsables. No vamos a adjudicar esto solamente a verdad, a un ente privado. En este caso el Departamento de la Vivienda, en ese caso específico en Vega Baja, el Departamento de la Vivienda y el Municipio porque era un antiguo vertedero. Se unieron juntos a empresas como fueron Motorola, Pfizer que ya no operaban y echaban los desperdicios en el lugar, pero pues nada, espero poder haber contestado su pregunta, porque mientras él hablaba recordé este caso que es tan reciente, que hace como un mes que cerramos operaciones allí. Incluyó unidad operable uno que era agua subterránea y unidad operable dos que era remoción de suelo. Nosotros recientemente culminamos con unidad operable de un proyecto, yo trabajé casi trece años en ese proyecto.

Adalberto Bosque: Como dijo Brenda, sabes, la Agencia tiene la autoridad para ir contra el que sea. Sea el gobierno o sea una industria privada, o contra todos, eso es bien importante. Si no hubiera partes responsables que tenga el dinero, o la capacidad financiera pues la Agencia pudiera estar costeándolo. Recuérdense estamos en un periodo de tiempo ahora que los chavos son un poco escasos, para el gobierno, estamos para el gobierno estatal y gobierno federal también. Si en un caso que la Agencia de Protección Ambiental Federal tuviera que pagar, la Agencia va por un 10% contra el gobierno, pudiera hasta un 50%, si es una facilidad que pertenece al gobierno pudiera ir hasta un 50%. Si no, hasta un 10%, pero en este caso nosotros entendemos que estamos en diálogo, estamos en diálogo y en evaluación para irnos hacia la implementación de la acción. Bien. Sr. Alcalde.

Isidro A. Negrón, Alcalde: Buenas noches a todos. Isidro Negrón el alcalde de San Germán. Primero que nada agradecer a la EPA por la intervención en este asunto y haber tenido siempre la deferencia desde el momento en que se aprobó en el Superfondo el que este estudio se hiciera me lo notificaran antes de que saliera a la prensa y nos dieron los datos para si la prensa preguntaba uno poder responder. Igual antes de traer esta información a la comunidad, pues también tuvieron la deferencia de reunirse conmigo, presentarme el informe y yo poderlo analizar antes de que se presentara aquí. Así que agradezco esa deferencia. A los residentes de esta comunidad que siempre estuvieron dispuestos a colaborar cuando se le pidió la colaboración de entrar a sus hogares, hacer monitoreo dentro de sus hogares, no todo el mundo está dispuesto a permitir que entren a sus casas, ¿verdad? Entienden que es un recinto sagrado. La pregunta que voy a hacer la voy a hacer para beneficio de los residentes que están aquí presentes. Yo conozco la respuesta pero como no se ha dicho y puede estar en la mente de ellos, la quiero hacer. Aquí no se ha adjudicado todavía quien es el responsable, podrían ser los que estuvieron antes, podrían ser los que están ahora, o podrían haber sido ambos. Si asumimos que los que fueron antes son los responsables y los que están ahora no lo son, pues ciertamente se adjudicará y ellos se harán responsables de la limpieza, pero si se encuentra que los responsables son los que están ahora se inicia un proceso de limpieza conforme aquí se ha establecido, ¿cuál es el mecanismo que se va a establecer para asegurarse que una vez se limpió los que han provocado la contaminación no lo van a volver a hacer?

Adalberto Bosque: Buena pregunta. La Agencia tiene, la Agencia de Protección Ambiental Federal tiene diferentes mecanismos, diferentes leyes. Cuando digo leyes,

diferentes programas que trabajan con aire, con desperdicios peligrosos, con descargas a un cuerpo de agua y así sucesivamente, y se le da seguimiento. Se le da seguimiento a las operaciones de las compañías, independientemente el tipo de reglamento para el cual tuvieran que estar cumpliendo. En el caso de aquí en San Germán, como en todos los demás sitios, la Agencia definitivamente de Protección Ambiental Federal le ha dado seguimiento, le ha dado seguimiento a estos lotes, ¿no?, a las compañías que están aquí envueltas, que están envueltos. Los abogados de la Agencia de Protección Ambiental Federal han estado en intercambio de información, pedido de información, intercambio de información y los inspectores de la Agencia de Protección Ambiental Federal han estado dándole seguimiento al cumplimiento de las normas establecidas por estas compañías. Cuando hay caso como este definitivamente la Agencia pues interviene, busca información y hace una investigación para determinar que no esté ocurriendo un derrame, digo un tipo de actividad que siga causando ese tipo de problema de contaminación. Entiéndase los accidentes pueden ocurrir, los accidentes pueden ocurrir, independientemente sean naturales o humanos, pero la Agencia de Protección Ambiental Federal, la Junta de Calidad Ambiental le dan seguimiento a estas compañías para tratar de evitar de que esto ocurra en el futuro, y las compañías definitivamente. Una compañía que tiene una situación como esta con más razón tiene que darle un seguimiento más de cerca para estar seguro de que esta situación no ocurra. Así también del dueño de, en este caso, el Gobierno de Puerto Rico, la compañía de Fomento Industrial es dueña de este y otros parques industriales, alrededor de toda la isla. Entiendo yo que cuando saben de que tienen un problema de contaminación, pues ellos tienen un personal en área de ambiental, área de

propiedades donde tienen que darle un seguimiento más de cerca para estar seguro de que esto no vuelva a ocurrir o minimizar de que pueda seguir ocurriendo, ¿bien? De que puede ocurrir, pues definitivamente un accidente pudiera estar ocurriendo. Bien. ¿Alguna otra pregunta?

Brenda, estamos entonces, ¿no? Bien pues entonces... Pregunta por allá. Licenciado.

Pedro Nieves: Muy buenas noches, Pedro Nieves de Fiddler, González y Rodríguez, en representación de Wallace quería hacer la aclaración que en la versión del documento que se les entregó hoy, y eso lo habíamos hablado, el nombre de la compañía está identificado incorrectamente. La compañía que opera actualmente es Wallace Silversmiths Puerto Rico, Ltd. Eso es todo. Buenas noches.

Adalberto Bosque: Gracias por la aclaración. Bien. Ese es el nombre y ese nombre va a estar debidamente corregido. Se piden las excusas, ¿no? Va a estar debidamente corregido. Bien. Si no hay ninguna otra pregunta les pedimos que por favor aquellas personas que no hayan firmado el registro de asistencia, así lo puedan hacer. Cualquier pregunta que puedan tener saben dónde pueden conseguirnos. Algún residente de aquí de San Germán si necesita que vengamos aquí en persona, nos reunamos aquí en su hogar, pues estamos en la mejor disposición de contestarle cualquier pregunta. Muchas gracias y buenas noches.

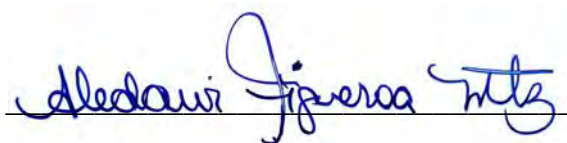
CERTIFICADO DE TRANSCRIPTORA

Yo, Aledawi Figueroa Martínez, transcriptor de Smile Again Learning Center, Corp. CERTIFICO:

Que la que antecede constituye la transcripción fiel y exacta de la grabación realizada durante la reunión celebrada en el sitio y la fecha que se indican en la página uno de esta transcripción.

Certifico además que no tengo interés en el resultado de ese asunto y que no tengo parentesco en ningún grado de consanguinidad con las partes involucradas en el mismo.

En Isabela, Puerto Rico, a 27 de agosto de 2015.

A handwritten signature in blue ink, reading "Aledawi Figueroa Martínez", written over a horizontal line.

Aledawi Figueroa Martínez
Smile Again Learning Center, Corp.

**APPENDIX VII
RESPONSIVENESS SUMMARY**

**San German Groundwater Contamination Superfund Site
OU-1**

**PUBLIC COMMENTS PREPARED IN SUPPORT
OF THE RESPONSIVENESS SUMMARY FOR THE
RECORD OF DECISION
SAN GERMAN GROUNDWATER CONTAMINATION SITE – OU1 SOIL
SAN GERMAN, PUERTO RICO**

On August 12, 2015, the U.S. Environmental Protection Agency (EPA) released for public comment the Proposed Plan for the San German Groundwater Contamination Site (Site) – Operable Unit 1 Soil. During the public comment period, EPA held a public meeting on August 19, 2015, to discuss and accept comments regarding the Proposed Plan. EPA received verbal comments at the public meeting as well as written comments during the public comment period, which lasted from August 12, 2015 through October 24, 2015. EPA's initial thirty (30) days comment period was extended in response to a request for an extension. This document summarizes comments from the public at the public meeting on August 19, 2015, and those submitted via mail. EPA's responses are provided following each comment.

The comments are grouped generally in the following categories:

- Background
- Remedial Investigation
- Risk Assessments
- Feasibility Study
- Preferred Alternative - Alternative S3
- Vapor
- Miscellaneous

Background

Comment 1: A representative of the current tenant of the CCL property (CCL Label) summarized the company's position with regard to the TCE source area found there. The representative indicated that the company did not arrive at the property until August 1995, and that previous tenants were likely users of TCE. Furthermore, the representative indicated studies at the time of occupancy showed that TCE was already present in soils, and that the company did not use TCE in its processes. Finally, the representative indicated that the CCL property does not contain septic systems (and did not in 1995), and instead uses the Puerto Rico Aqueduct and Sewer Authority (PRASA) sewer system.

Because of these conclusions, CCL asked EPA to delete references to the "CCL lot," "CCL label source area," "CCL Label," or similar terms, and that EPA identify the property by another term without making reference to the name CCL.

Response 1: The name designations "Wallace" and "CCL" for the source areas is made solely for the ease of reference and is not intended to infer a determination of liability on the part of the companies that currently occupy the property. While referring to the property, EPA cites it as the

property currently occupied by CCL, and that the lot is owned by the Puerto Rico Industrial Development Company (PRIDCO). As such, the Site reports will not be revised.

Comment 2: CCL further stated that EPA has failed to perform a full and complete search for potentially responsible parties (PRPs) at the Site. Other tenants of the Retiro Industrial Park, including former occupants of the CCL and Wallace lots, and the owners of additional area facilities may also be PRPs for the identified well field contamination. CCL alleges that EPA did not fully research the universe of PRPs and facts associated with 44 area facilities and only recently acknowledged potential contributions of other parties to the releases or threats of releases of hazardous substances affecting the Site by issuing notice letters and/or requests for information to six companies on September 16, 2015.

Response 2: The administrative record was developed to support EPA's findings about releases found at the Site and is not meant to be an exhaustive evaluation about potential enforcement actions that EPA may consider in response to those releases.

Remedial Investigation

Comment 3: Section 1.3.2.2 of the RI Report (CCL Label Section) - This section indicates that presently the CCL property does not have septic tanks, a conclusion that is consistent with PRIDCO's original drawings of the CCL building. In some documents found in the review of PRIDCO's files found references to a septic tank in the premises associated with earlier tenants.

Response 3: EPA notes the information provided in the comment.

Comment 4: Section 1.3.2.2 of the RI Report (Wallace Section, 5th paragraph) PRIDCO suggested that the following sentence, "Manufacturing operations at this facility indicate that prior tenants may have generated spent solvents including PCE, TCE, and 1,1,1 trichloroethane (1,1,1 TCA)" be modified as follows: "Manufacturing operations at this facility indicate that site tenants may have generated spent solvents including PCE, TCE, and 1,1,1 trichloroethane (1,1,1 TCA)."

PRIDCO indicated that, in the 4th paragraph of this section, the existing Wallace silverware casting process is described as washing silverware in TCE to remove oil and other surface contaminants. In addition, EPA documents state that in 2006, EPA and the Puerto Rico Environmental Quality Board (PREQB) found drums of waste TCE and oil.

Response 4: EPA notes the information provided in the comment. The final documents for the Site will not be modified, as the change would not change the environmental findings made by the RI Report.

Comment 5: Section 4.2.2.2 of the RI Report (Wallace Section, 1st paragraph) - This paragraph references sampling point WS-02 showing the highest concentrations of PCE (7,960 µg/L) and TCE (900 µg/L). However, Figure 4-1 indicates that the highest concentrations of PCE and TCE were recorded at WS-03, not at WS-02.

Response 5: The commenter is correct: the RI report references WS-02 with the highest groundwater grab sample result, whereas the correct boring reference is WS-03. If results are referenced in any future Site documents, the correction will be made.

Comment 6: Section 5.2 of the RI Report (Soil Saturation Limit)) - The PCE soil saturation limit is described in this paragraph as 166 mg/kg. However, RI Table 5-1 shows the soil saturation limit for PCE to be 145 mg/kg.

Response 6: The commenter is correct. If soil saturation is discussed in any future documents for the Site, the correct soil saturation limit of 145 mg/kg will be used.

Comment 7: The RI Report states that the groundwater flow is to the north-northwest. However, the Report also indicates that the straight alignment of the monitoring wells from the industrial park to the public supply wells makes it difficult to determine the exact flow direction. The north-northwest flow may have been also influenced by the PRASA pumping rate. The RI Report appears to suggest also that there might be a flow more northerly - towards the Guanajibo River - than reported. A representative for CCL further indicated that tributary streams to the river likely act as aquifer drains, and that there is a small creek or stream on the north-northeast side of the CCL property which may have a local influence in groundwater flow direction in a more northerly direction than EPA states.

Furthermore, the USGS Topographic Map from 1966 corresponding to the San German Quadrangle shows the small creek on the north-northeast side of the CCL property. This creek might have been relocated during construction of the industrial park. It is possible that the current creek or any previous water body in the area that might have been affected during construction of the industrial park could influence the groundwater in the area to a more northerly or northeast direction than EPA states.

Response 7: The RI Report supports the conclusion that when the three PRASA wells were pumping, these wells likely influenced the direction of groundwater flow. The RI Report further acknowledges that the direction of groundwater flow is probably shifting back to a more natural flow direction (toward the river), now that the three wells are no longer in service. Additional monitoring wells will be installed to more precisely define the current direction of groundwater flow and the impact of groundwater flow on the distribution of contamination as part of Operable Unit 2 for the Site.

Comment 8: A representative for CCL stated that EPA cannot conclude that the CCL property is a source of TCE without discarding the potential scenario that the TCE found at CCL originates from degradation of PCE that had migrated from the property currently occupied by Wallace. The RI Report indicates that PCE degrades into TCE, DCE, and Vinyl Chloride. Furthermore, according to the RI Report, except for PCE (where the highest concentrations in groundwater and soil were found at Wallace), most of the highest concentrations of TCE, *cis*-1,2-DCE, vinyl chloride and 1,1-DCE in soil and groundwater were found at the CCL. This might indicate that PCE is migrating from Wallace and degrading into the substances found at CCL, as the groundwater flows in a more northerly direction towards the small creek and other storm water

channels that may be acting as aquifer drains. This potential scenario is consistent with some of these contaminants of concern (COCs) being found in the surface water samples at the small creek and at the storm water channel adjacent to CCL. The RI Report also states that these COCs would rapidly volatilize based on half-lives of several hours to several days. Therefore, unless a discharge of these COCs into the small creek or storm water channel had occurred hours or several days before the sampling - keeping in mind that CCL does not use these COC- the presence of these substances in the creek could be an additional indication of degradation and migration through groundwater flow into these bodies of water acting as aquifer drains.

EPA states in the RI Report that separate plumes of PCE and TCE originate at Wallace and at CCL, respectively. It also mentions that PCE predominates at Wallace and TCE predominates at CCL. However, there is no documented evidence in the administrative record showing that the COCs were used or spilled at CCL by any of its tenants. Furthermore, higher TCE vapor concentrations at Wallace do not support EPA's theory of two separate plumes.

Response 8: TCE can be a degradation product of PCE under certain environmental conditions, though it is a common chemical for degreasing and cleaning purposes in many industrial operations. Based on the pattern of contamination observed at the two source areas, EPA believes that the TCE in both soil and groundwater in the vicinity of the building currently occupied by CCL does not originate at Wallace. TCE is observed at much higher levels than PCE in both soil and groundwater near the building currently occupied by CCL, whereas PCE is observed at much higher levels than TCE in both soil and groundwater in the vicinity of the other source area. In addition, TCE observed in soil samples above the water table in the vicinity of the building currently occupied by CCL cannot have plausibly originated at Wallace. The hydrological conditions and sampling results support that there are two separate source areas.

As stated in the response to comment number 7, additional groundwater investigations will be conducted at the Site for OU-2 to resolve the uncertainty in the groundwater flow direction.

Soil gas samples at Wallace and at other lots were not collected for the purpose of delineating the extent of the soil or groundwater source areas, and were not used in the RI for that purpose. Soil gas concentrations are influenced by a variety of factors, and it is not possible to use the RI soil gas data as a delineation tool to predict soil or groundwater transportation pathways, or to attribute the TCE contamination to one source or two, as the commenter suggests.

Comment 9: No subsurface soil and/or groundwater samples were collected in "Street 8" (Calle B) of the industrial park between CCL and Wallace. Samples in this area might have provided better technical data to determine potential sources and groundwater flow direction in the area.

Response 9: The commenter is correct that no soil or groundwater samples were collected in Calle B during the RI. As stated previously, additional monitoring wells will be installed for OU- 2 to resolve the uncertainty in the direction of groundwater flow and to fill other data gaps.

Comment 10: Surface water and sediment samples were collected in the storm water channel between the Property and the PRIDCO lot formerly leased by Baytex, and at the small creek

north/northeast of CCL. Samples, however, appear to have been collected downstream of other storm water discharge points from the remaining properties of the industrial park into the creek and into the channels that run adjacent to CCL. There are also storm water pipes or collection systems from other areas of the industrial park that discharge into the Property through its southwest and southeast sides and crossing CCL towards the small creek. Therefore, it is also possible that samples taken downstream of the storm water discharges point might be reflecting potential discharges of these COCs from other facilities in the industrial park. Also, the Administrative Record does not provide any information or documentation regarding depth and structural integrity of the storm water system of the industrial park, specifically, the segments of that system that crosses through CCL to the discharge point at the small creek.

Response 10: Surface water and sediment samples were collected at locations near the industrial buildings in Retiro Industrial Park that were identified during a Site reconnaissance visit to the area. Samples were collected both in catch basins and in channelized streams. Only a limited number of sample results exceeded the screening criteria used for the RI Report and the FS determined that remediation of surface water and sediment was not needed since the soil remedy is expected to reduce contaminants in these media in the future. Therefore, EPA concluded that the TCE and PCE source areas were the likely source of these surface water/sediment detections; no other source areas were identified in the RI.

Comment 11: CCL stated that EPA's theory is that waste solvents and or waste waters were likely discharged to the ground surface resulting in contamination of surface and subsurface soil at the two source areas. This theory, however, may be in conflict with soil sampling results at the CCL property, noting that, with few exceptions, were not found in surface soils, but at greater depths. Also, EPA provides no explanation as to why contaminants were found only at certain depths but not consistently at all depths. CCL suggests that this inconsistent pattern of contaminant distribution could indicate potential cross-contamination or “false positive” results.

Response 11: Data used in the RI was validated using the quality control/quality assurance plans included in the administrative record, following standard EPA protocols. Only data that passed EPA's validation protocols were used in the RI, and the results are considered valid and appropriate for use in the RI report, the risk assessments, and the FS report. Given that the releases may have occurred many years prior to the RI sampling, minimal detections of VOCs in shallow soils is not surprising, as the contaminants readily volatilize when exposed to air. The “intermittent” results in the subsurface could be related to the type of soil present, and the porosity and/or permeability of the soil in the unsaturated zone, or the sample frequency. None of these supposed anomalies disagree with EPA's assessment of the source area.

Comment 12: There is not enough information in the studies to discard the possibility that changes in groundwater levels during dry and wet seasons might have also contributed to the presence of the contaminants in soils at different depth levels, and at multiple locations within the industrial park. CCL understands that there might be a possibility that soil contamination may be related to changes in groundwater levels during dry or wet seasons.

Response 12: The selected remedy for OU-1 will address contamination above and below the water table, including contamination within the zone of water level fluctuation due to wet and dry season changes in the water table.

Comment 13: According to section 4.2.2.3 of the RI Report, EPA took 43 groundwater samples at 37 locations along 11 transects at the Site. Samples from transects T0-2 and T0-3 showed detections of TCE (2.53J, 1.32J) respectively, and *cis*-1,2-DCE (0.76J, 2.01J) respectively, below the EPA's screening criteria of 5 µg/L for TCE and 70 for *cis*-1,2-DCE. These transects are up-gradient of the CCL property and were installed at the PRIDCO lot immediately adjacent to the eastern boundary of the CCL property. CCL identified parties that are currently occupying up-gradient lots (GE Industrial of PR, LLC, and Pace Analytical del Caribe Inc.). Furthermore, CCL indicated that there had been violations of the Resource Conservation and Recovery Act by both these companies, and that at least GE Industrial handled solvents similar to the ones found at CCL, suggesting that there was an up-gradient source.

Response 13: Very low levels of TCE and *cis*-1,2-DCE were detected in groundwater screening samples from transect T0 as described in the comment. The detections in transects T1 and T2, located adjacent to the building occupied by CCL, were orders of magnitude higher than in transect T0. Since the screening samples from these transects were collected from the very top of the water table, contaminant migration from another source to transects T1 and T2 is unlikely, especially when the soil and groundwater “grab” sample results are also considered. Utilizing all of the data collected during the RI, it is clear that significant soil and groundwater contamination is present on the east side of the building currently occupied by CCL.

Comment 14: A representative for CCL noted that catch basins on the CCL property receive drainage from up-gradient properties in the industrial park, and indicated that these up-gradient properties could be sources of the contamination found on the CCL property. Furthermore, the CCL representative noted that catch basins on up-gradient properties were not sampled, suggesting that further investigations are needed into these properties.

Response 14: Data from multiple media collected during the RI were evaluated to determine the sources of contamination in the soil, and the connection between the soil contamination and the groundwater plumes that were identified. In the vicinity of the building occupied by CCL, elevated concentrations of TCE and other chlorinated compounds were observed in the soil and in the groundwater at the top of the water table, linking the two media. It is highly unlikely that the contamination identified in the unsaturated soil could be transported from some up-gradient location, and the clear link between the soil and groundwater contaminants indicates the groundwater plume was also unlikely to originate at a separate location.

As part of the supplemental groundwater investigations for OU-2, additional monitoring wells will be installed to confirm contaminant concentrations and to enhance the understanding of the groundwater flow direction.

Risk Assessments

Comment 15: The risk assessments prepared to evaluate the significance of contaminant exposures are misleading and exaggerate Site risks. The risks identified in the screening-level ecological risk assessment (SLERA) report are primarily based upon theoretical exposures to naturally occurring metals associated with the igneous geology of the area. After documenting excessive ecological risk through several exposure mechanisms, it was concluded in the SLERA that Site-related contaminants pose no risk to ecological receptors. The HHRA also identified various risks to human health due to the presence of naturally-occurring metals including vanadium and chromium (also, all chromium was assumed to have been present in its most toxic valence state, which is virtually never the case). Future risks attributable to the presence of chlorinated VOCs in groundwater were largely based upon the assumption that the Retiro Industrial Park would become a future residential development, which is to be specifically prohibited under institutional land use controls described in the Proposed Plan.

Response 15: The risk assessments performed for the Site fully complied with EPA protocols and procedures for conducting both human health and ecological risk assessments at Superfund sites.

Feasibility Study

Comment 16: Section 1.5.4 of the FS Report indicates that the hydraulic conductivity for the saprolite zone was estimated to be between 5 to 15 feet per day. It indicates that, with a hydraulic gradient of 0.022, the estimated groundwater flow velocity would be between 40 to 120 feet per year. Using the effective porosity included in Table 5-1 of the RI report (0.43), a representative for CCL computed groundwater flow velocities that are twice as much as the values shown in the FS Report. Also, it is not clear how the groundwater flow velocity in the saprolite will increase if the hydraulic gradient is reduced to 0.011. Since the reviewer did not find in the report the raw data used in the calculations presented in this section, it was not possible to assess whether or not they are accurate, but recommended that the groundwater flow velocity estimated values included in the FS be checked for accuracy.

Response 16: The groundwater flow conditions will be evaluated further as part of the additional work for OU-2. The OU-1 FS did not rely on these calculated values in preparing or assessing remedial alternatives.

Comment 17: Section 2.2.2 of the FS Report - Site Related ARARs and TBCs (1st paragraph) - This paragraph makes reference to Table 2-1 and Table 2-2. However, these tables make reference to the Cidra Ground Water Contamination Site.

Response 17: The commenter is correct; the Site name on the two tables referenced is incorrect. The information in the tables, however, is correct and applicable to the San German Groundwater Contamination Site.

Comment 18: Section 2.6.2.3 Groundwater Use Restrictions - This section indicates that groundwater use restrictions or well drilling restrictions are generally administrated by the

PREQB. However, it is our understanding that these restrictions in Puerto Rico are administered by the Department of Natural and Environmental Resources and not by the PREQB.

Response 18: The commenter is correct, groundwater use restrictions or well drilling restrictions would be administered by the Department of Natural and Environmental Resources.

Comment 19: Currently, the only identified source materials for potential groundwater contamination at the Wallace location consist of chlorinated VOC-impacted soils within the vadose zone, predominantly at one discrete area of the property. The purpose of the proposed remedy for OU-1 of the Site is to address soil contamination that acts as a continuing source of groundwater contamination, referred to in CERCLA practice as "source material" or "principal threats". Data from the RI demonstrate that elevated concentrations of chlorinated VOCs in the upper seven feet of soil within two primary source areas (SAs) of the Wallace lot (SA-2 and SA-3) rapidly decrease with depth to undetectable or relatively low "estimated" concentrations just above the shallow water table. Due to restriction of rainfall infiltration as a result of surface paving, chlorinated VOC source material from SA-3 has not migrated significantly to impact underlying groundwater. It also appears likely that chlorinated VOC contamination in the deepest vadose zone soils at SA-1 has occurred as a result of vapor migration from underlying groundwater constituents, and not from a surface source. In addition, contaminated groundwater is generally not considered source material under CERCLA, and chlorinated VOCs do not appreciably bond to soils in the saturated zone unless non-aqueous phase liquid (NAPL) is present. Contaminant transport is evident within the groundwater plume and no NAPL was identified or observed during RI investigations. Therefore, the only principal threat that has been shown to exist at the Wallace location in the Retiro Industrial Park is chlorinated VOC contamination in the soil vadose zone, principally from source area SA-2, and potentially due to future contaminant migration from SA-3.

Response 19: The contaminated soil identified during the RI is clearly linked to the extremely high concentrations of PCE and TCE in the groundwater beneath the building occupied by Wallace and is considered "source material" for the groundwater contamination. While concentrations in the soil column may be somewhat variable, the data clearly show the link between the identified contamination in the soil and the groundwater. It is, therefore, appropriate for EPA to select a remedy for OU-1 that addresses these high concentrations of contamination in the soil, and at the same time, using the same technology, address the extremely high concentrations in the very shallow groundwater.

Preferred Alternative - Alternative S3

Comment 20: The Plan states that EPA selected soil vapor extraction (SVE) and dual-phase extraction (DPE)/*in-situ* treatment as the preferred alternative for remediation at both sources. EPA identified five source areas to be remediated. SA-4 SA-5 are located at the CCL property. The Plan proposes *in-situ* treatment for SA-4 and DPE/*in-situ* treatment for SA-5. The Plan, however, does not provide enough information to determine whether excavation at SA-4 would be

less expensive and more effective than *in-situ* treatment, considering that contamination in that area appears to be localized at a depth of 5 to 7 feet. Regarding SA-5, the plan proposes the installation of 4 wells at CCL, versus 13 at SA-2 located at Wallace. However, it does not provide a breakdown of the costs for each of the properties when it is likely that costs at one property would be less than at the other. As previously stated, CCL understands based on the Administrative Record, that it is very likely that there is only one source of contamination at the Site. Notwithstanding, EPA should break down the costs of the different remedial alternatives by SAs and properties since the analytical data is vastly different in concentrations at each of the properties and costs would be different. Consequently, for purposes of the remedy selection costs, the two properties and its SAs should not be considered as one big site, with the same weight of importance and remedy.

Response 20: The cost details for Alternative S3, the preferred alternative, are provided in the FS report in Appendix A. The alternative was costed with the assumption that all of the identified areas targeted for remediation would be addressed simultaneously, not as individual remediation projects. EPA does not agree with the assessment that the contamination is from a single source. The soil contamination above the water table on the eastern side of the building occupied by CCL Label could not have originated at another location and the groundwater contamination in this area is clearly linked to the source area on the eastern side of the building. However, additional groundwater investigations will be conducted for Operable Unit 2, as discussed in responses to previous comments.

Comment 21: The remedial actions proposed for SA-2 are redundant and potentially counter-productive to achieve the remediation goals of the Proposed Plan. The conceptual remedy for SA-2 summarized in the Proposed Plan anticipates simultaneous operation of SVE and DPE systems, followed by *in-situ* treatment. Some form of active vapor intrusion mitigation would also ostensibly be initiated soon, and would continue until subsurface conditions preclude significant chlorinated VOC vapor generation and migration. The Wallace location is underlain by a vadose zone between 14 and 30 feet thick. For this relatively thin soil column, simultaneous operation of SVE and DPE technologies is redundant since both rely on reduced pressure extraction. If a third sub-slab vapor ventilation system were installed to address vapor intrusion, the redundancy would be further exaggerated. Additionally, operation of a DPE system in the shallow groundwater stratum would increase the dissolved oxygen concentration of the residual groundwater due to aspiration of atmosphere air. Since subsequent *in-situ* reductive dechlorination requires anaerobic (oxygen free) conditions, the sequential implementation of these two technologies would be counter-productive. Consequently, not only is DPE not necessary for response to Site risks, its application may even preclude the successful implementation of an otherwise viable remedial option for OU-2 groundwater.

Response 21: The purpose of the conceptual description of the remedy for SA-2 is to cover all the components that may be required to reduce the contaminant mass at the SA-2 area and meet the remedial action objectives. The selection and sequencing of these remedial technologies to achieve the maximum contaminant mass reduction would be completed as part of the remedial design. If pre-design investigations indicate the presence of dense non-aqueous phase liquids

(DNAPLs), the application of DPE could quickly and significantly reduce the contaminant mass prior to application of in situ treatment. The final selection and sequence of treatment for area SA-2 and all other treatment areas will be part of the remedial design for OU-1.

Comment 22: The optimum methodology for chlorinated VOC remediation at SA-2 of the Wallace location is SVE. For the same reasons SVE has been selected as the preferred technology for capturing and treating chlorinated VOC contamination at SA-1 and SA-3 of the Wallace location, SVE should be applied as the initial remedial technique for SA-2. Subject to development of design criteria during the pre-design investigation, a well-engineered SVE system could capture chlorinated VOCs from the subsurface, extending from the groundwater/vadose zone interface to sub-slab vapor accumulation areas. Additionally, the effectiveness of SVE could be established expeditiously, well before permitting of a DPE effluent discharge could be accomplished for mobilization of that technology. Finally, utilization of SVE to remove source material from the vadose zone would allow for simultaneous pilot testing of *in-situ* groundwater treatment technologies for the elevated chlorinated VOC groundwater concentration areas of OU-2.

Response 22: Based on currently available data at SA-1 and SA-3, the released contaminants may not have reached the groundwater and that is why only SVE has been proposed. As specified in the previous response, the pre-design field investigations will gather additional data that will allow the remedial design to select the final treatment technologies and their sequencing for each source area. EPA has concluded that SVE alone may not be sufficient to address SA-2. The final remedial components and sequencing for SA-2 will be addressed in remedial design.

Comment 23: From the limited data collected to date, reductive dechlorination appears to provide the most promising *in-situ* treatment technique for groundwater remediation. Even with current antagonistic conditions of dissolved oxygen and low organic carbon concentrations in the shallow groundwater, reductive dechlorination of PCE is occurring as evidenced by identified decomposition products. Observed ORP data and favorable Puerto Rico weather conditions should allow conditions to be optimized for chlorinated VOC degradation in areas of highest concentration, followed by monitored natural attenuation of the entire groundwater plume.

Response 23: EPA will thoroughly evaluate potential remedies for OU-2 (groundwater) in a separate feasibility study and present the results to the public in a Proposed Plan for OU-2.

Vapor Intrusion

Comment 24: Wallace has already initiated implementation of an appropriate vapor exposure mitigation technology to protect its employees, and no additional vapor intrusion removal action is necessary. At the Wallace location, elevated sub-slab VOC levels have been measured in the past, but no validated exceedances of OSHA's permissible exposure limits have been identified. Nevertheless, Wallace has implemented a vapor intrusion mitigation initiative consisting of sealing entryways (such as foundation cracks, utility penetrations and floor drains) and applying a seal coating to the floors in its manufacturing buildings; increasing natural building ventilation by installing fans and opening windows; and verifying the effectiveness of these programs through periodic workplace VOC monitoring.

Response 24: The high concentrations of vapors beneath the concrete foundation of the building occupied by Wallace represent a situation that, if conditions in the foundation were to change, concentrated vapors could migrate inside the work space of the building and affect the wellbeing of the employees. EPA expects to continue to work with Wallace through EPA's removal program to protect the health of workers in the future. The remedy selected for OU-1 is expected to remove the source areas that are the source of the vapors.

Comment 25: The subslab soil gas and indoor air sampling results at the former Baytex lot, downgradient from CCL, exhibited concentrations of TCE and PCE that are orders of magnitude higher than those detected at CCL. Therefore, it seems obvious that the presence of these substances at the former Baytex lot is either the result of releases at that lot or as a result from migration of substances from other neighboring properties, but not from CCL.

Response 25: The sub-slab soil gas and indoor air results at the former Baytex building originate from the groundwater contaminant plume that is associated with the building occupied by Wallace. The contamination associated with the building occupied by Wallace exhibits higher concentrations of PCE rather than TCE. The vapor results at the former Baytex building also follow this pattern. The soil and groundwater contamination associated with the building occupied by CCL has higher concentrations of TCE than PCE. This pattern was also observed in the vapor samples collected at the building occupied by CCL. The data appears to support that the elevated vapor levels collected from the former Baytex building originate from the plume associated with the source area identified at the building occupied by Wallace.

Miscellaneous

Comment 26: Has any study been performed in the San Germán area to see if the incidence of cancer has increased during the time the contamination in the three PRASA wells was used for drinking purposes? EPA has also identified some wells that may have been used by people for years and may have caused health problems such as cancer or more serious illnesses.

Response 26: A health study of the San Germán area has not been performed. However, PRASA samples and tests public supply wells on a quarterly basis, so the contamination in the supply wells was identified and verified to be below the federal maximum contaminant level (MCL) from 2001 to 2005. When the concentration of PCE approached the MCL in the Retiro well, PRASA stopped pumping at that location and eventually shut down all three supply wells in the area. At that point, the case was referred to EPA and resulted in the listing of the Site on the National Priorities List in 2008.

EPA is aware that some residents of the Santa Marta neighborhood have private wells. During the remedial investigation, EPA sampled the wells for which we could obtain access. EPA has communicated the sample results to the owners and has worked with the municipality to educate well owners regarding the risks of using well water that could be contaminated. EPA will continue to work with local officials to educate the local residents who could be impacted by the contamination.

Comment 27: Who will assume the cost for the work at the Site? Will companies that caused the problem be held liable? Some of them are still in operation, others are not, but they can be contacted and, if they are liable they must assume responsibility.

Response 27: EPA is evaluating the companies that currently occupy the properties where contamination has been identified and is also evaluating records of past tenants of the properties to determine liability for the contamination.

Comment 28: What mechanism will be established to ensure that once the Site is cleaned up the companies will not re-contaminate the properties?

Response 28: The businesses that currently occupy the industrial park do not currently use the industrial solvents that are associated with the Site. EPA and PREQB have established programs that inspect and evaluate environmental issues at industrial facilities. The facilities in the industrial park will continue to be monitored and inspected to insure that good and lawful waste management procedures are followed.

Comment 29: The version of the Proposed Plan EPA provided contains a misstated name for Wallace. The company currently operating there is Wallace Silversmiths of Puerto Rico, Ltd.

Response 29: EPA regrets the error and will ensure that the correct name will be used in future documents.

**APPENDIX VIII
FIGURES**

**San German Groundwater Contamination Superfund Site
OU-1**

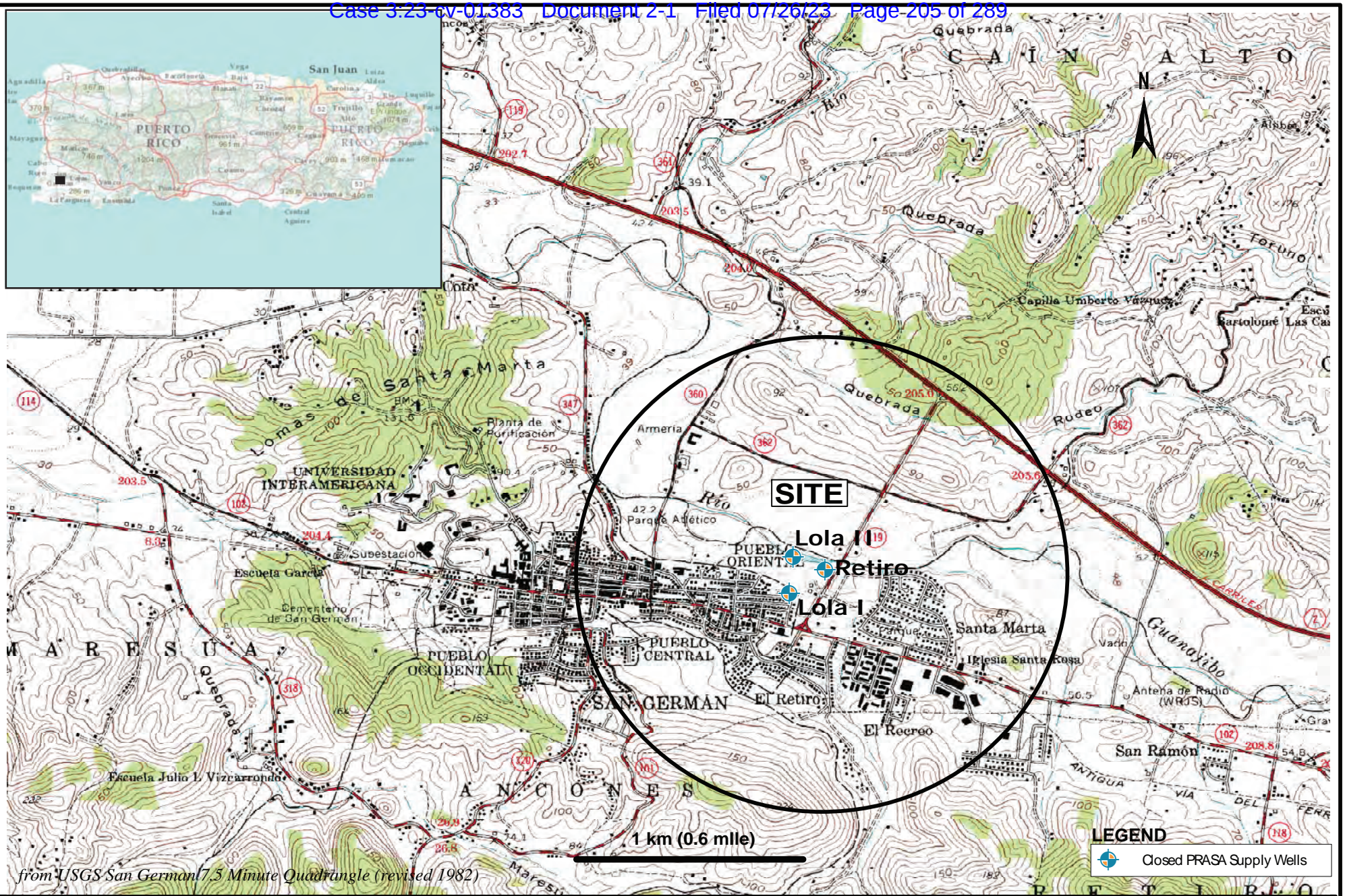


Figure 1
Site Location Map
San German Groundwater Contamination Site
San German, Puerto Rico

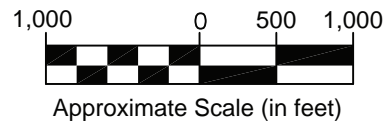
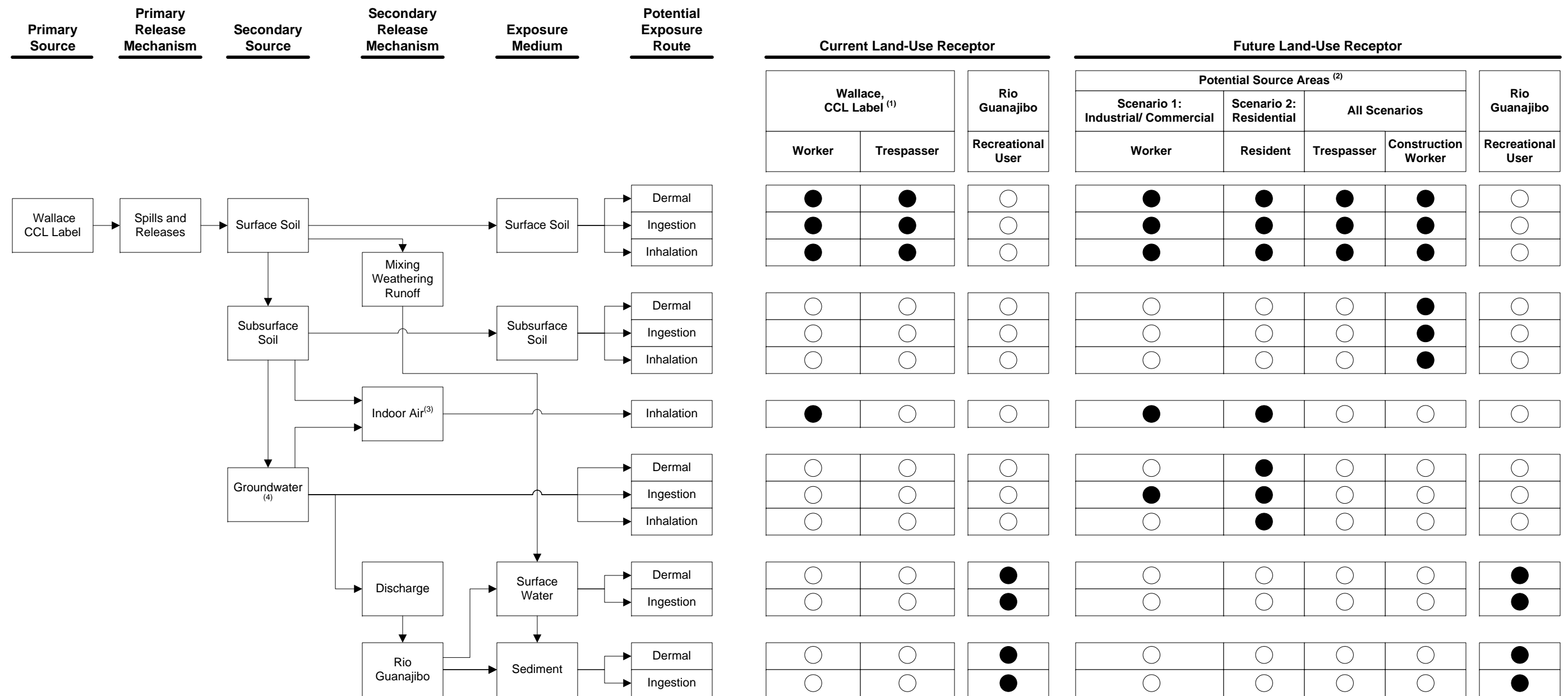
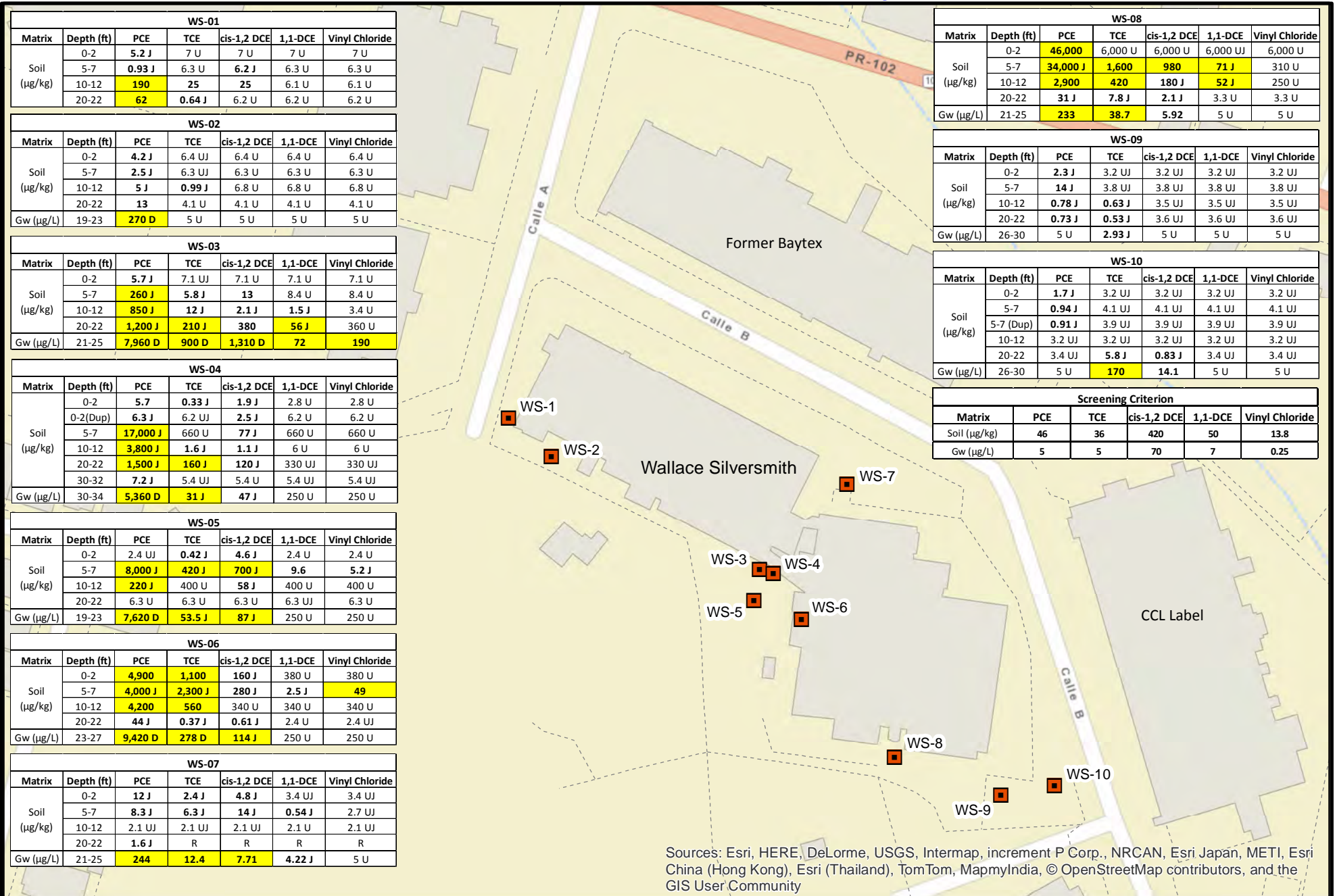


Figure 2
Site Map
San German Groundwater Contamination Site
San German, Puerto Rico



Legend:
 ● complete exposure pathway
 ○ incomplete/insignificant exposure pathway

Note:
⁽¹⁾ Samples collected from Acorn Dry Cleaners, Pitusa-National Lumber, and Former Baytex were under pavement, so they are not evaluated under current land-use scenario. Same receptors are evaluated for each exposure area separately.
⁽²⁾ Potential Source Areas are Acorn Dry Cleaners, Wallace, Pitusa-National Lumber, Former Baytex, and CCL Label. Same receptors are evaluated for each exposure area separately.
⁽³⁾ Indoor air is evaluated qualitatively.
⁽⁴⁾ Groundwater is evaluated as one plume using all monitoring well samples.
 Trespasser and Recreational User: Adolescents (12 to <18 years old)
 Resident: Adults and Children (birth to <6 years old)



LEGEND

■ Soil/Groundwater Screening Location

Notes:
 PCE- tetrachloroethene
 TCE- trichloroethene
 DCE - dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

D - diluted
 J - estimated
 U - not detected
 ft - feet

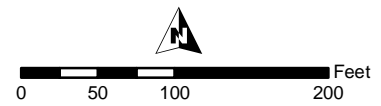
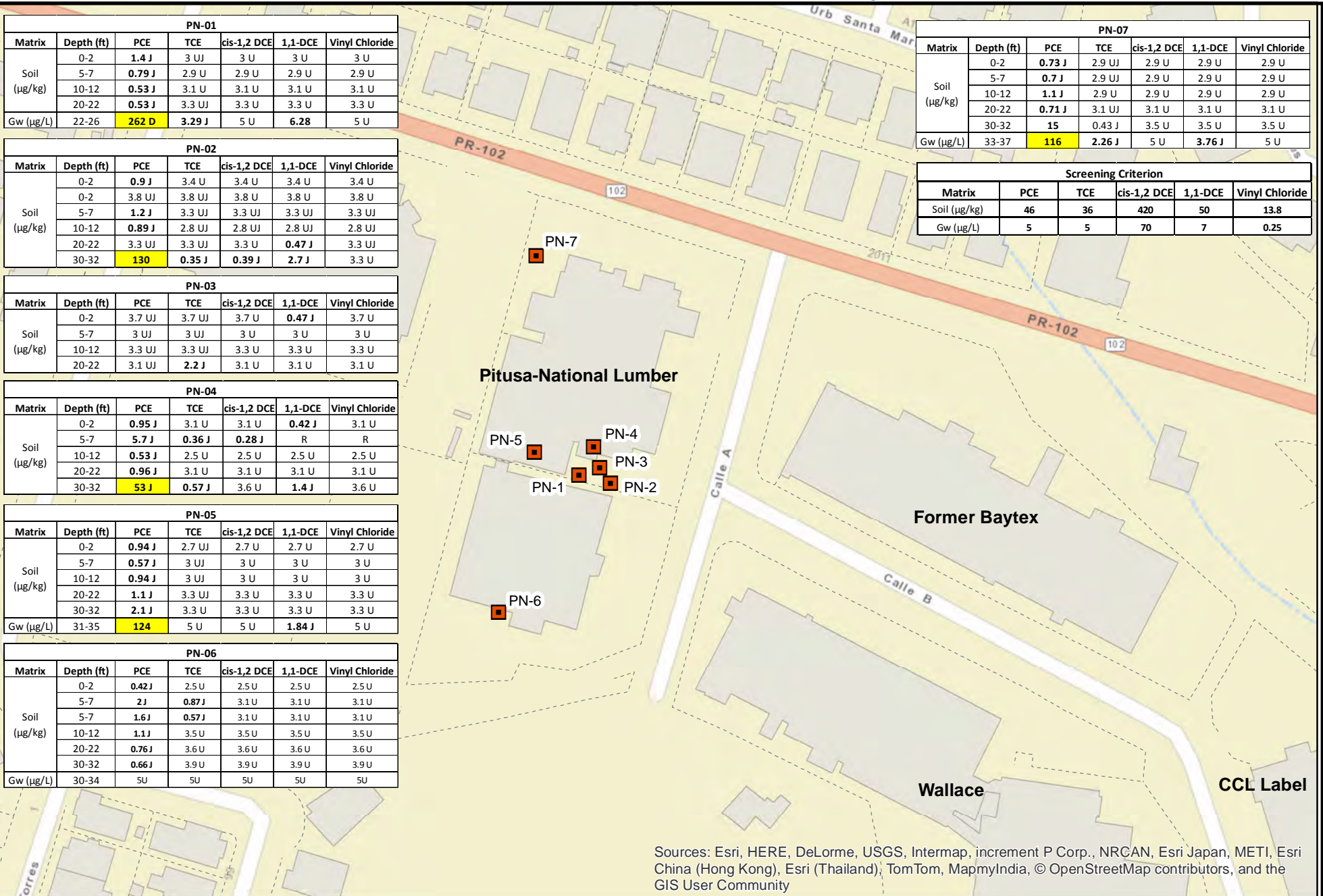


Figure 5
Wallace Soil and Groundwater Screening Sampling Results
San German Groundwater Contamination Site
San German, Puerto Rico



LEGEND
 Soil/Groundwater Screening Location

Notes:
 PCE- tetrachloroethene
 TCE- trichloroethene
 DCE - dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

D - diluted
 J - estimated
 U - not detected
 ft - feet

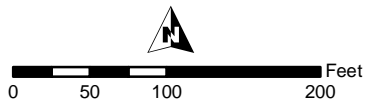
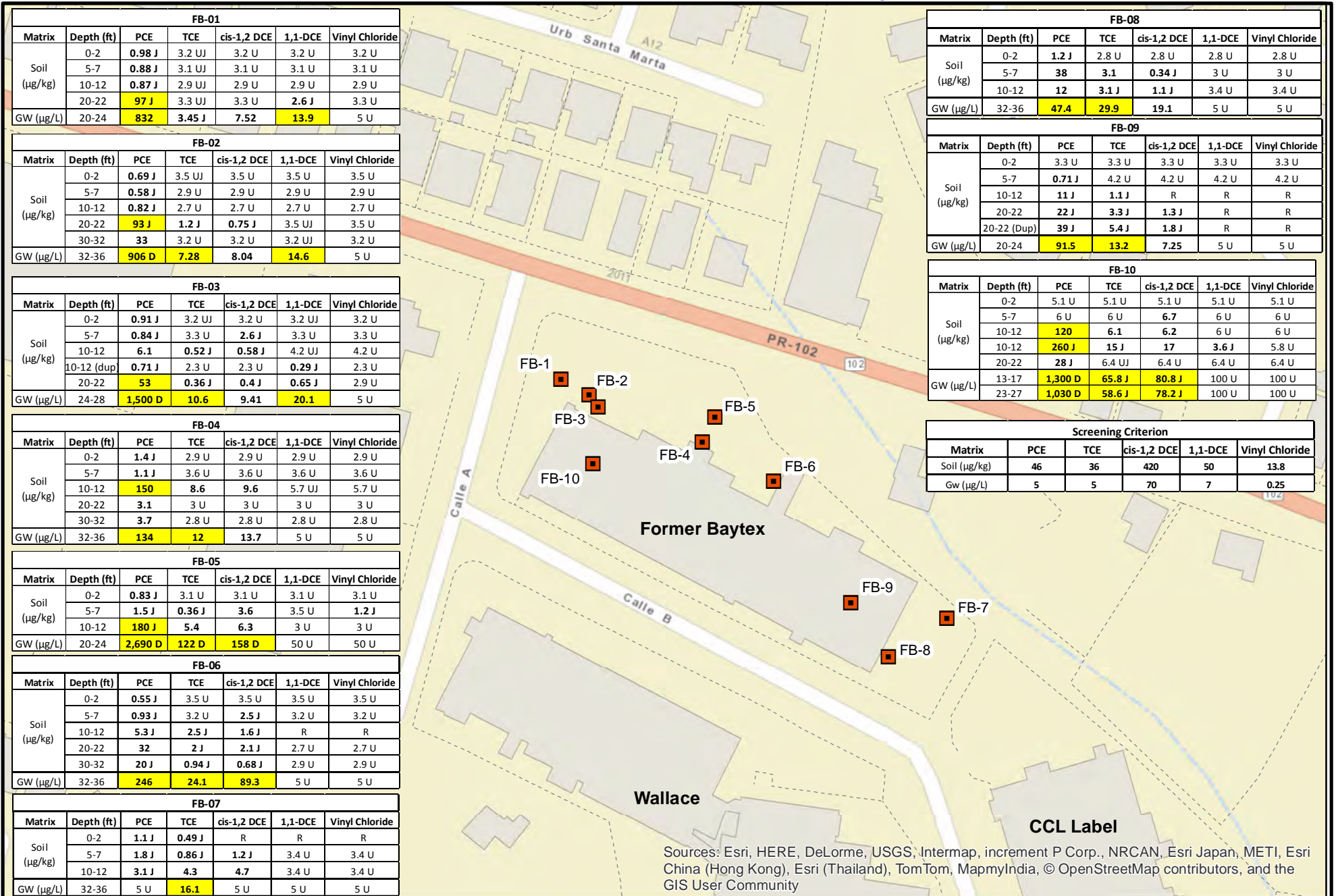


Figure 6
Pitusa Soil and Groundwater Screening Sampling Results
San German Groundwater Contamination Site
San German, Puerto Rico



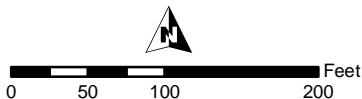
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



LEGEND
 Soil/Groundwater Screening Location

Notes:
 PCE- tetrachloroethene
 TCE- trichloroethene
 DCE - dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

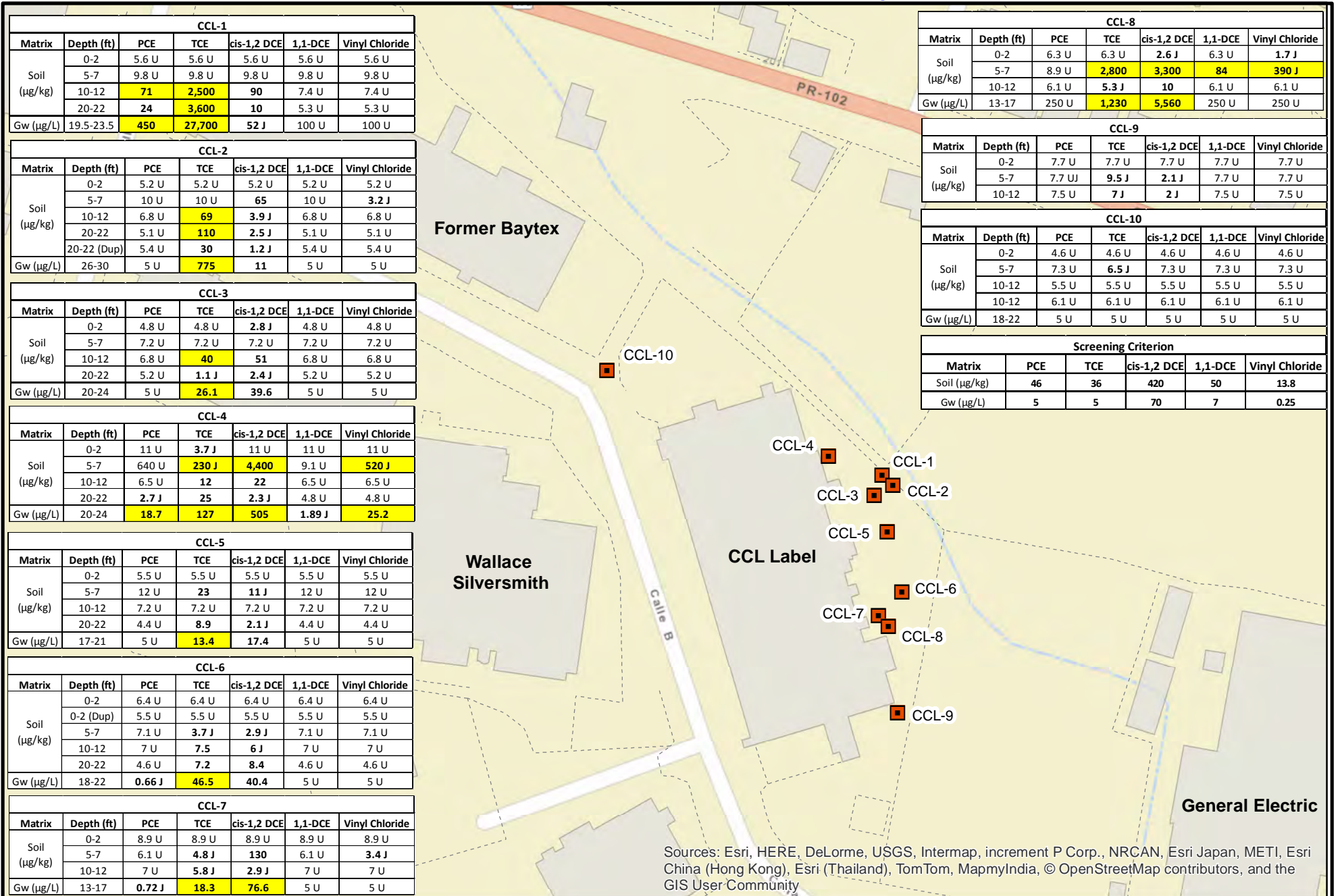
D - diluted
 J - estimated
 U - not detected
 ft - feet



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Figure 7
Former Baytex Soil and Groundwater Screening Sampling Results
San German Groundwater Contamination Site
San German, Puerto Rico





Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

LEGEND
 Soil/Groundwater Screening Location

Notes:
 PCE- tetrachloroethene
 TCE- trichloroethene
 DCE - dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

D - diluted
 J - estimated
 U - not detected
 ft - feet

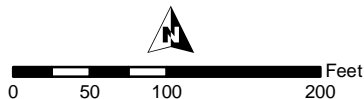


Figure 8
CCL Label Soil and Groundwater Screening Sampling Results
San German Groundwater Contamination Site
San German, Puerto Rico



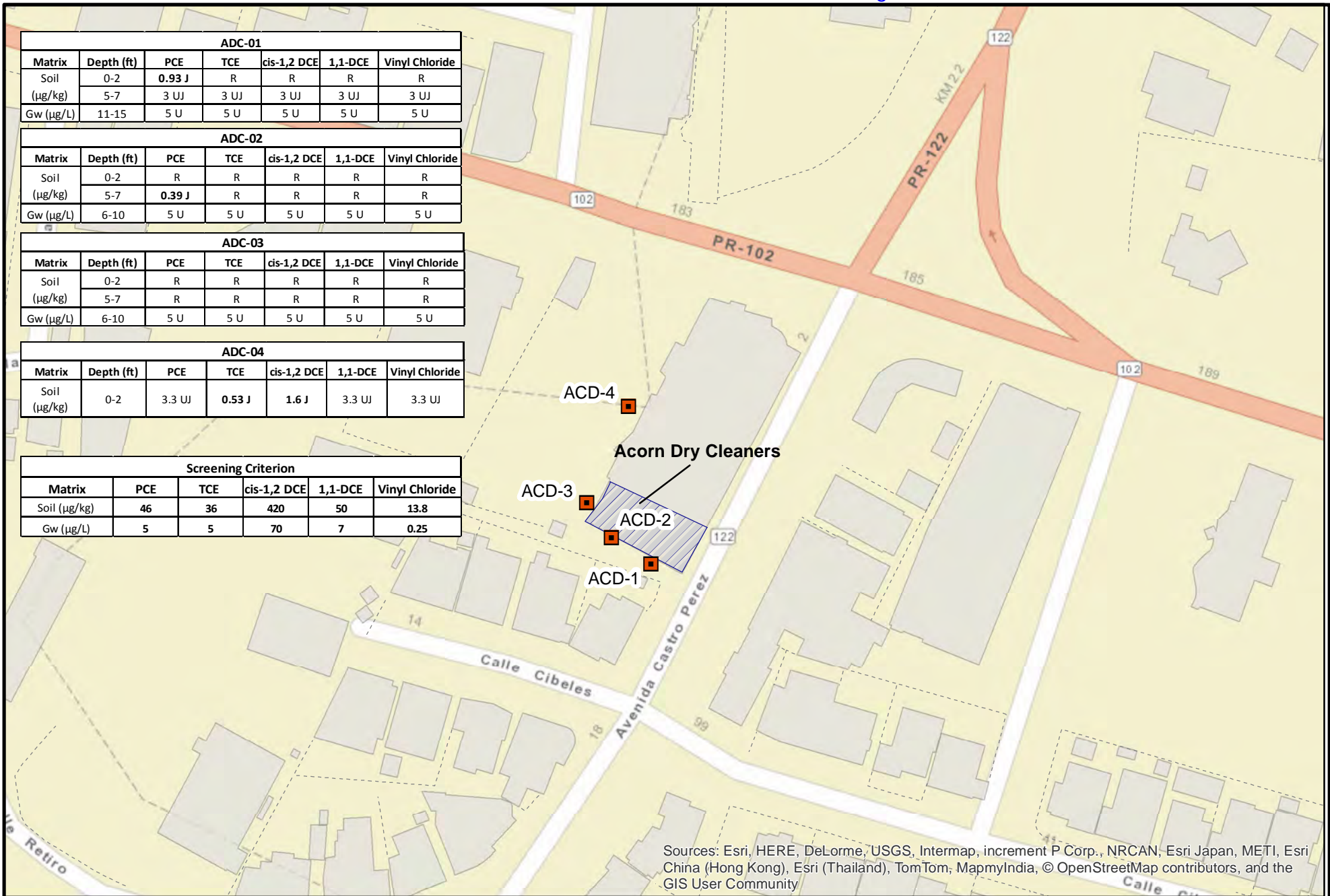
ADC-01						
Matrix	Depth (ft)	PCE	TCE	cis-1,2 DCE	1,1-DCE	Vinyl Chloride
Soil	0-2	0.93 J	R	R	R	R
(µg/kg)	5-7	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Gw (µg/L)	11-15	5 U	5 U	5 U	5 U	5 U

ADC-02						
Matrix	Depth (ft)	PCE	TCE	cis-1,2 DCE	1,1-DCE	Vinyl Chloride
Soil	0-2	R	R	R	R	R
(µg/kg)	5-7	0.39 J	R	R	R	R
Gw (µg/L)	6-10	5 U	5 U	5 U	5 U	5 U

ADC-03						
Matrix	Depth (ft)	PCE	TCE	cis-1,2 DCE	1,1-DCE	Vinyl Chloride
Soil	0-2	R	R	R	R	R
(µg/kg)	5-7	R	R	R	R	R
Gw (µg/L)	6-10	5 U	5 U	5 U	5 U	5 U

ADC-04						
Matrix	Depth (ft)	PCE	TCE	cis-1,2 DCE	1,1-DCE	Vinyl Chloride
Soil	0-2	3.3 UJ	0.53 J	1.6 J	3.3 UJ	3.3 UJ
(µg/kg)						

Screening Criterion					
Matrix	PCE	TCE	cis-1,2 DCE	1,1-DCE	Vinyl Chloride
Soil (µg/kg)	46	36	420	50	13.8
Gw (µg/L)	5	5	70	7	0.25



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

LEGEND
 Soil/Groundwater Screening Location

Notes:
 PCE - tetrachloroethene
 TCE - trichloroethene
 DCE - dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

D - diluted
 J - estimated
 U - not detected
 ft - feet

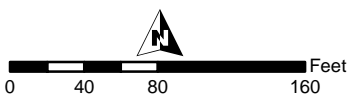
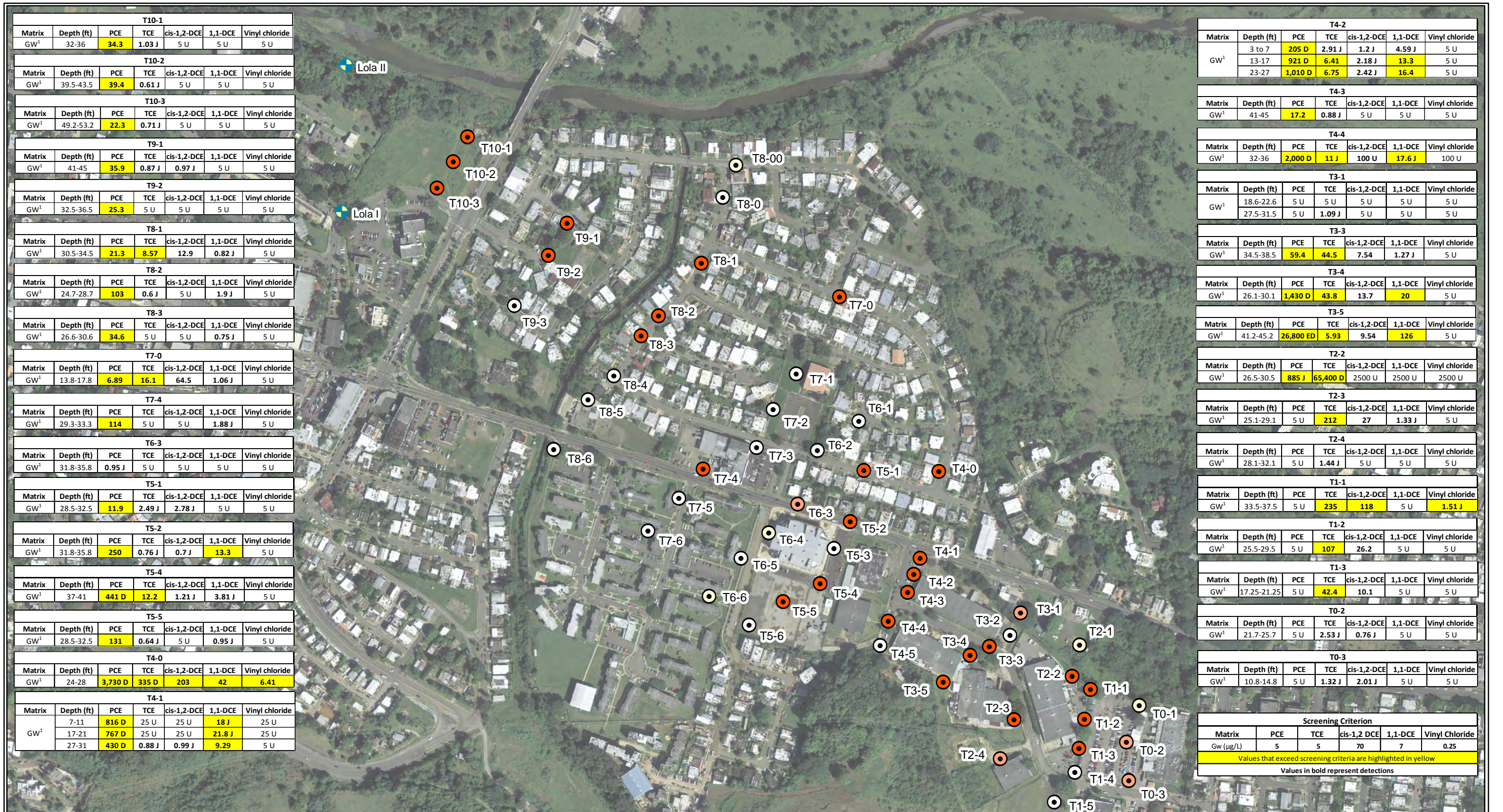





Figure 9
Acorn Dry Cleaners Soil and Groundwater Screening Sampling Results
San German Groundwater Contamination Site
San German, Puerto Rico





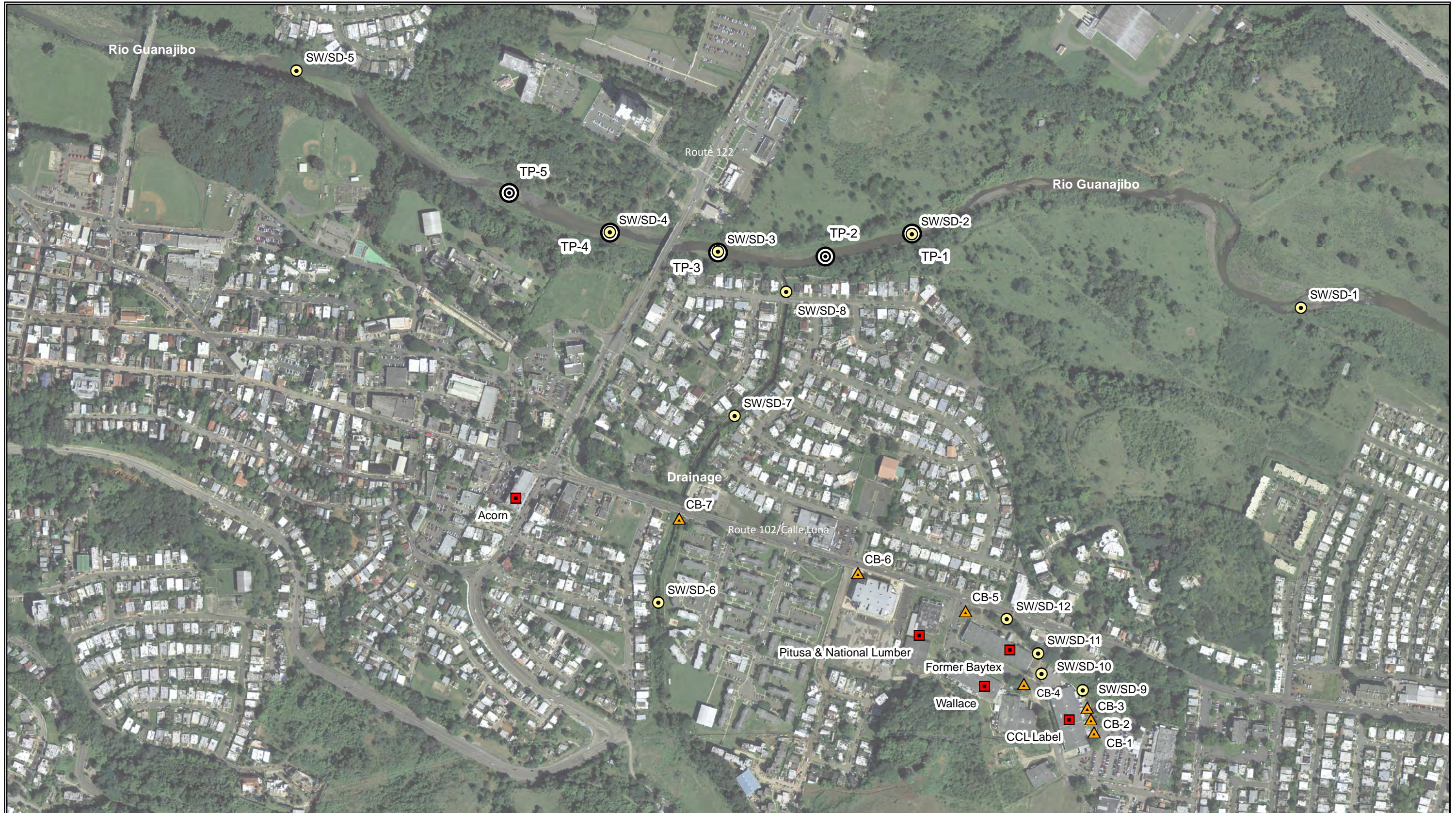


- Legend**
-  Monitoring Well Location
 -  Temporary Piezometer Location
 -  Staff Gauge

- Acronyms:**
- MW-2S - Shallow Monitoring Well
 - MPW-7 - Multiport Bedrock Monitoring Well
 - MW-4C - Bedrock Monitoring Well with Screen



Figure 11
Monitoring Well and Piezometer Locations
San German Groundwater Contamination Site
San German, Puerto Rico



- Legend**
- Surface Water and Sediment Sampling Location
 - Potential Source Areas
 - ⊙ Pore Water/Temporary Piezometer Location
 - ▲ Catch Basin Sampling Location

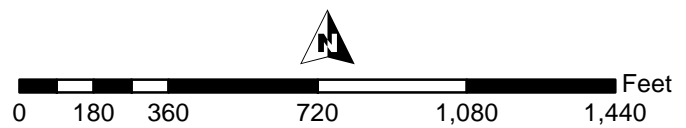
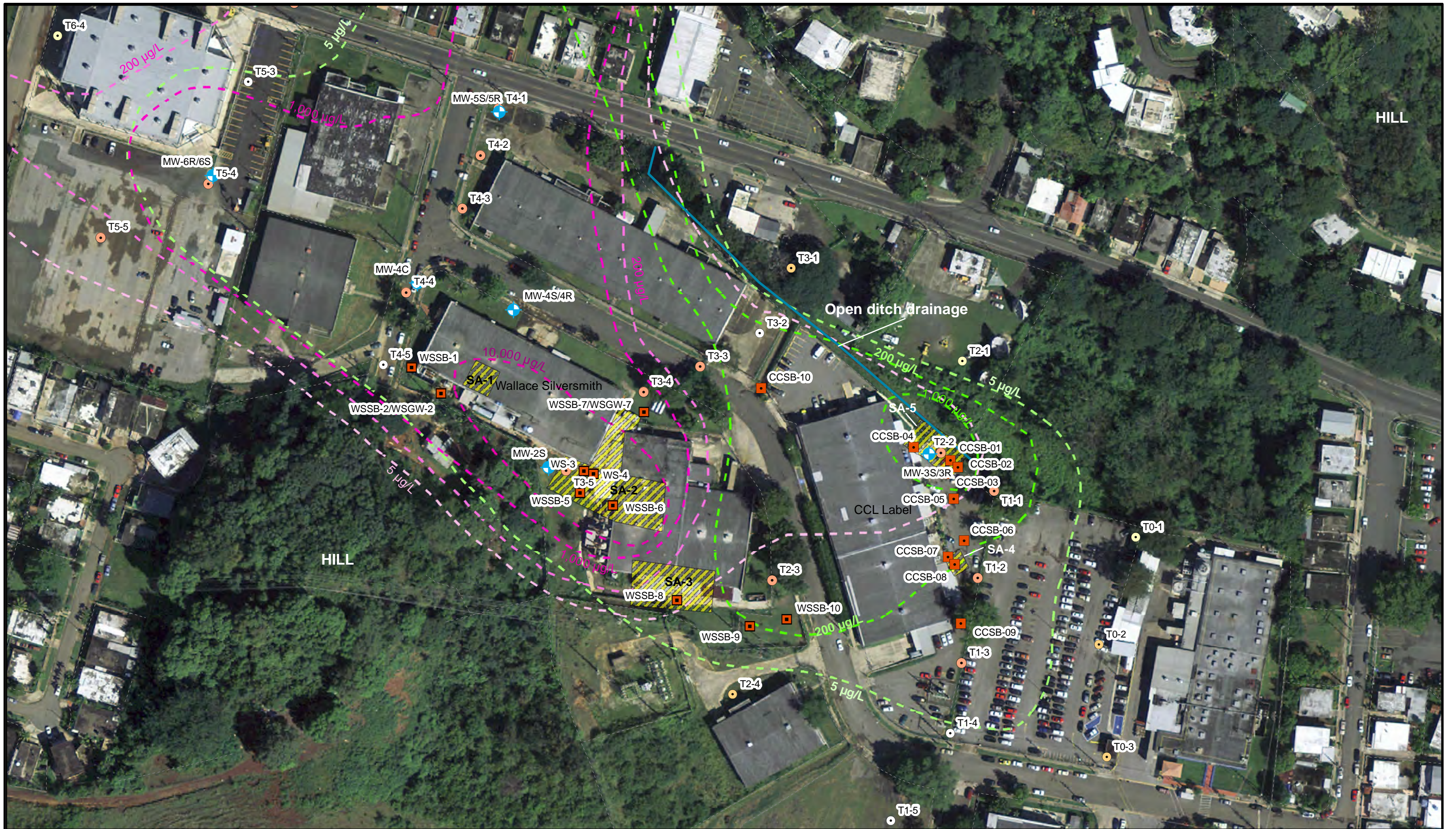


Figure 12
Surface Water, Sediment and Pore Water Sampling Locations
San German Groundwater Contamination Site
San German, Puerto Rico



LEGEND

- Soil Screening Location
- Monitoring well
- Groundwater Screening
- SA-1 - Source area 1, estimated
- PCE isoconcentration contour
- TCE isoconcentration contour
- Drainage ditch

Notes:
 PCE- tetrachloroethene
 TCE- trichloroethene
 DCE- dichloroethene
 Gw - groundwater
 µg/kg - micrograms per kilogram
 µg/L - micrograms per liter

D - diluted
 J - estimated
 U - not detected
 ft - feet

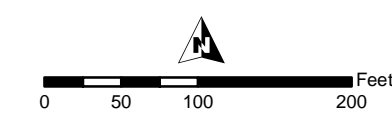


Figure 13
Contamination Source Areas
San German Groundwater Contamination Site
San German, Puerto Rico

**APPENDIX IX
TABLES**

**San German Groundwater Contamination Superfund Site
OU-1**

TABLE 1
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water	Trichloroethene	0.6	1,700	ug/l	33/104	182	ug/l	97.5% KM (Chebyshev) UCL
	Tetrachloroethene	0.82	13,00	ug/l	33/104	1,198	ug/l	97.5% KM (Chebyshev) UCL
	Vinyl chloride	0.27	84	ug/l	14/104	5.5	ug/l	95% Approximate Gamma KM-UCL

UCL – upper-confidence limit

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs in groundwater. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived. A qualitative analysis also identified trichloroethene and tetrachloroethene as COCs in soil due to elevated soil gas concentrations.

TABLE 2. Selection of Exposure Scenarios

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Current	Soil	Surface soil	Acorn, Former Baytex, Pitusa	Worker	Adult	Ing/Der/Inh	Quantitative
				Trespasser	Adolescent (12-18)	Ing/Der/Inh	Quantitative
			CCL Label, Wallace	Worker	Adult	Ing/Der/Inh	Quantitative
				Trespasser	Adolescent (12-18)	Ing/Der/Inh	Quantitative
	Groundwater	Groundwater	Groundwater	Worker	Adult	Ing	None
				Indoor air	Indoor air	Worker	Adult
	Surface water	Surface water	Rio Guanajibo	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative
Sediment	Sediment	Rio Guanajibo	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative	
Future	Soil	Surface soil	Acorn, Former Baytex, Pitusa, CCL Label, and Wallace	Worker	Adult	Ing/Der/Inh	Quantitative
				Trespasser	Adolescent (12-18)	Ing/Der/Inh	Quantitative
				Resident	Adult/Child	Ing/Der/Inh	Quantitative
	Groundwater	Groundwater	Groundwater	Construction worker	Adult	Ing/Der/Inh	Quantitative
				Worker	Adult	Ing	Quantitative
				Resident	Adult/Child	Ing/Der/Inh	Quantitative
				Worker	Adult	Inh	Qualitative
	Surface water	Surface Water	Rio Guanajibo	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative
				Resident	Adult/Child	Inh	Qualitative
	Sediment	Sediment	Rio Guanajibo	Recreational user	Adolescent (12-18)	Ing/Der	Quantitative

Ing – Ingestion

Der – Dermal

Inh - Inhalation

Summary of Selection of Exposure Pathways

The table describes the exposure pathways that were evaluated for the risk assessment. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3**Non-Cancer Toxicity Data Summary****Pathway: Oral/Dermal**

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Trichloroethene	Chronic	5E-04	mg/kg-day	1	5E-04	mg/kg-day	Heart	10 to 1000	IRIS	02/24/15
Tetrachloroethene	Chronic	6E-03	mg/kg-day	1	6E-03	mg/kg-day	CNS	1000	IRIS	02/24/15
Vinyl chloride	Chronic	3E-03	mg/kg-day	1	3E-03	mg/kg-day	Liver	30	IRIS	02/24/15

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Trichloroethene	Chronic	2E-03	mg/m ³	-----	-----	Heart	10 to 100	IRIS	02/24/15
Tetrachloroethene	Chronic	4E-02	mg/m ³	-----	-----	CNS	1000	IRIS	02/24/15
Vinyl chloride	Chronic	1E-01	mg/m ³	-----	-----	Liver	30	IRIS	02/24/15

Key

-----: No information available

CNS – Central Nervous System

IRIS: Integrated Risk Information System, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in soil, indoor air and groundwater. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4**Cancer Toxicity Data Summary****Pathway: Oral/Dermal**

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Trichloroethene	4.6E-02	(mg/kg/day) ⁻¹	4.6E-02	(mg/kg/day) ⁻¹	Carcinogenic to humans	IRIS	02/24/15
Tetrachloroethene	2.1E-03	(mg/kg/day) ⁻¹	2.1E-03	(mg/kg/day) ⁻¹	Likely to be carcinogenic to humans	IRIS	02/24/15
Vinyl chloride	7.2E-01	(mg/kg/day) ⁻¹	7.2E-01	(mg/kg/day) ⁻¹	A	IRIS	02/24/15

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Trichloroethene	4.1E-06	1(ug/m ³)	-----	-----	Carcinogenic to humans	IRIS	02/24/15
Tetrachloroethene	2.6E-07	1(ug/m ³)	-----	-----	Likely to be carcinogenic to humans	IRIS	02/24/15
Vinyl chloride	4.4E-06	1(ug/m ³)	-----	-----	A	IRIS	02/24/15

Key:

IRIS: Integrated Risk Information System. U.S. EPA
 -----: No information available

EPA Weight of Evidence:

A – Known human carcinogen

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in soil, indoor air and groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe:		Future						
Receptor Population:		Resident						
Receptor Age:		Adult/Child						
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Trichloroethene	Heart	10/18	1.9/3	74/56	87/77
			Tetrachloroethene	CNS	6/10	3.5/5.8	23/17.7	33/33.5
			Vinyl chloride	Liver	-----	-----	-----	-----
Hazard Index Total=								120/110.5
CNS – central nervous system								
Summary of Risk Characterization - Non-Carcinogens								
<p>The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects. A qualitative analysis also identified trichloroethene and tetrachloroethene as COCs in soil due to elevated soil gas concentrations.</p>								

TABLE 6
Risk Characterization Summary - Carcinogens

Scenario Timeframe:		Future					
Receptor Population:		Resident					
Receptor Age:		Adult/Child					
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Trichloroethene	2E-04	3E-05	3E-04	5E-04
			Tetrachloroethene	3E-05	2E-05	9E-05	1E-04
			Vinyl chloride	3E-04	1E-05	8E-04	1E-03
Total Risk =						1.6E-03	
Summary of Risk Characterization – Carcinogens							
<p>The table presents cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. A qualitative analysis also identified trichloroethene and tetrachloroethene as COCs in soil due to elevated soil gas concentrations.</p>							

Table 7
Chemical-specific ARARs, Criteria, and Guidance
San German Groundwater Contamination Site
San German, Puerto Rico

Regulatory Level	ARAR	Status	Requirement Synopsis	Feasibility Study Consideration
Federal	National Primary Drinking Water Standards (40 CFR 141) - MCLs	Relevant and Appropriate	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety. Groundwater at the site is currently not used as a source of drinking water.	The standards were used to develop the PRGs to accommodate any future use of site groundwater as a source of drinking water supply.
Federal	Soil Screening Guidance	To Be Considered	Presents a framework for developing risk-based, soil screening levels (SSLs) for protection of human health.	The guidance document was used to develop PRGs for soil to protect the groundwater as a future source of drinking water supply.

Acronyms:

ARARs - Applicable or Relevant and Appropriate Requirements

CFR - Code of Federal Regulations

MCL - Maximum Contaminant Limit

PRGs - Preliminary Remediation Goals

SSL - Soil Screening Level

Table 8
Action-specific ARARs, Criteria, and Guidance
San German Groundwater Contamination Site
San German, Puerto Rico

Regulatory Level	ARARs	Status	Requirement Synopsis	Feasibility Study Consideration
<i>General - Site Remediation</i>				
Federal	OSHA Recording and Reporting Occupational Injuries and Illnesses (29 CFR 1904)	Applicable	This regulation outlines the record keeping and reporting requirements for an employer under OSHA.	These regulations apply to the companies contracted to implement the remedy. All applicable requirements will be met.
Federal	OSHA Occupational Safety and Health Standards (29 CFR 1910)	Applicable	These regulations specify an 8-hour time-weighted average concentration for worker exposure to various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below the 8-hour time-weighted average at these specified concentrations.
Federal	OSHA Safety and Health Regulations for Construction (29 CFR 1926)	Applicable	This regulation specifies the type of safety equipment and procedures to be followed during site remediation.	All appropriate safety equipment will be on-site, and appropriate procedures will be followed during remediation activities.
Federal	RCRA Identification and Listing of Hazardous Wastes (40 CFR 261)	Applicable	This regulation describes methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation is applicable to the identification of hazardous wastes that are generated, treated, stored, or disposed during remedial activities.

Regulatory Level	ARARs	Status	Requirement Synopsis	Feasibility Study Consideration
Federal	RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)	Applicable	Describes standards applicable to generators of hazardous wastes.	Standards will be followed if any hazardous wastes are generated on-site.
Federal	RCRA Standards for Owners/Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – General Facility Standards (40 CFR 264.10 – 264.19)	Relevant and Appropriate	This regulation lists general facility requirements including general waste analysis, security measures, inspections, and training requirements.	Facility will be designed, constructed, and operated in accordance with this requirement. All workers will be properly trained.
Commonwealth of Puerto Rico	Regulation of the Puerto Rico Environmental Quality Board (PREQB) for the Prevention and Control of Noise Pollution	Applicable	This standard provides the standards and requirements for noise control.	This standard will be applied to any remediation activities performed at the site.
<i>Waste Transportation</i>				
Federal	Department of Transportation (DOT) Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171, 172, 177 to 179)	Applicable	This regulation outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials.	Any company contracted to transport hazardous material from the site will be required to comply with this regulation.
Federal	RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)	Applicable	Establishes standards for hazardous waste transporters.	Any company contracted to transport hazardous material from the site will be required to comply with this regulation.

<i>Waste Disposal</i>				
Federal	RCRA Land Disposal Restrictions (40 CFR 268)	Applicable	This regulation identifies hazardous wastes restricted for land disposal and provides treatment standards for land disposal.	Hazardous wastes will be treated to meet disposal requirements.
Federal	RCRA Hazardous Waste Permit Program (40 CFR 270)	Applicable	This regulation establishes provisions covering basic EPA permitting requirements.	All permitting requirements of EPA must be complied with.
Commonwealth of Puerto Rico	PREQB Regulation for the Control of Non-Hazardous Solid Waste (November 1997)	Applicable	This regulation establishes standards for the generation, management, transportation, recovery, disposal and management of non-hazardous solid waste.	Control activities for the non-hazardous wastes must comply with the treatment and disposal standards.
Commonwealth of Puerto Rico	PREQB Regulation for the Control of Hazardous Solid Waste (September 1998)	Applicable	This regulation establishes standards for management and disposal of hazardous wastes.	All remedial activities must adhere to these regulations while handling hazardous waste during remedial operations.
<i>Stormwater Management</i>				
Federal	Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under section 438 of the Energy Independence and Security Act	Applicable	This regulation establishes standards for stormwater management.	If site activities require development of more than 5,000 square feet, project will take the guidance into consideration.

<i>Water Discharge or Subsurface Injection</i>				
Federal	National Pollutant Discharge Elimination System (NPDES) (40 CFR 100 et seq.)	Applicable	NPDES permit requirements for point source discharges must be met, including the NPDES Best Management Practice (BMP) Program. These regulations include, but are not limited to, requirements for compliance with water quality standards, a discharge monitoring system, and records maintenance.	Project will meet NPDES permit requirements for point source discharges.
Federal	Safe Drinking Water Act – Underground Injection Control (UIC) Program (40 CFR 144, 146)	Relevant and Appropriate	Establish performance standards, well requirements, and permitting requirements for groundwater re-injection wells.	Project will evaluate the requirement for injection of reagent for in situ treatment.
Commonwealth of Puerto Rico	Puerto Rico Water Quality Standards (PRWQS) Regulation, March 2010	Applicable	This regulation is to preserve, maintain and enhance the quality of the waters of Puerto Rico and regulate any discharge of any pollutant to the waters of Puerto Rico by establishing water quality standards. Water quality standards and use classifications are promulgated for the protection of the uses assigned to coastal, surface, estuarine, wetlands, and groundwaters of Puerto Rico.	Project will meet PRWQS requirements for point source discharges.

**APPENDIX X
EQB CONCURRENCE**

**San German Groundwater Contamination Superfund Site
OU-1**



COMMONWEALTH OF
PUERTO RICO
Environmental Quality Board

July 14, 2015

Dr. Adalberto Bosque, Remedial Project Manager
US Environmental Protection Agency (USEPA)
Caribbean Environmental Protection Division (CEPD)
City View Plaza II-Suite 7000
48 Road 165 km 1.2
Guaynabo, P.R. 00968-8069

RE: SAN GERMAN GROUNDWATER CONTAMINATION SITE PROPOSED PLAN
CONCURRENCE LETTER

Dear Mr. Bosque:

The Puerto Rico Environmental Quality Board (PREQB) has completed its review of the aforementioned document. This Proposed Plan (PP) dated July, 2015, identifies the preferred alternative to address soil source contamination areas subject of the OU-1 action at the San Germán Groundwater Contamination Site. All PREQB's comments and concerns were addressed through several meetings with USEPA and CDM Smith (USEPA contractor) representatives held on February 10, 2015 at CEPD facilities, on April 27, 2015 at San Germán and on June 15 at CEPD facilities. The preferred remedy, which is Alternative S3 (Soil Vapor Extraction/Dual Phase Extraction/ In-Situ Treatment) fulfills the requirement of protecting the public health and the environment from potential risk at the site. Therefore, PREQB concurs with the remedial technology selected in the PP.

If you have any questions, please feel free to contact the undersigned at (787) 767-8181 ext. 3234 or 3236 or Mr. Pascual E. Velázquez, State Remedial Project Manager assigned to this case at (787) 767-8181 ext. 3253 or by email at juanbaba@jca.pr.gov or pascualvelazquez@jca.pr.gov respectively.

Cordially,

Juan J. Babá Peebles

Manager

Superfund Program

Environmental Emergencies Response Area

Puerto Rico Environmental Quality Board

APPENDIX B

REMEDIAL DESIGN/REMEDIAL ACTION

STATEMENT OF WORK

Operable Unit 1

CCL Lot

San German Groundwater Contamination Superfund Site

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1. INTRODUCTION

- 1.1 Purpose of SOW.** This SOW sets forth the procedures and requirements for implementing the Work at the CCL Lot consistent with Section V of the Consent Decree (“Decree”).
- 1.2 Structure of the SOW**
- Section 2 (Community Involvement) sets forth EPA’s and HP and PRIDCO’s responsibilities for community involvement.
 - Section 3 (Coordination and Supervision) contains the provisions for selecting the Supervising Contractor and Project Coordinators regarding the Work.
 - Section 4 (Remedial Design) sets forth the process for developing the Remedial Design, which includes the submission of specified primary deliverables.
 - Section 5 (Remedial Action) sets forth requirements regarding the completion of the Remedial Action, including primary deliverables related to completion of the Remedial Action.
 - Section 6 (Reporting) sets forth HP and PRIDCO’s reporting obligations.
 - Section 7 (Deliverables) describes the contents of the supporting deliverables and the general requirements regarding HP and PRIDCO’s submission of, and EPA’s review of, approval of, comment on, and/or modification of, the deliverables.
 - Section 8 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the Remedial Action.
 - Section 9 (Commonwealth Participation) addresses Commonwealth participation.
 - Section 10 (References) provides a list of references, including URLs.
- 1.3** The scope of the remedy includes the actions described in the OUI Record of Decision, including soil vapor extraction for the vadose zone, and dual-phase extraction and/or *in-situ* treatment for the shallow saprolite zone (*e.g.*, enhanced anaerobic biodegradation), as applicable to the CCL Lot. The extent to which each of these components of the remedy will be implemented will be based on the outcomes of pre-design investigations and/or treatability and pilot testing.
- 1.4** The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Decree, have the meanings assigned to them in CERCLA, in such regulations, or in the Decree, except that the term “Paragraph” or “¶” means a paragraph of the SOW, and the term “Section” means a section of the SOW, unless otherwise stated.

2. COMMUNITY INVOLVEMENT

2.1 As requested by EPA, HP and PRIDCO shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with this Section. Such activities may include designation of a Community Involvement Coordinator ("CI Coordinator").

2.2 Community Involvement Responsibilities

- (a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. EPA will develop a Community Involvement Plan ("CIP") for the Site in accordance with 40 C.F.R. § 300.435(c), to describe public involvement activities during the Work.
- (b) **HP and PRIDCO's CI Coordinator.** If requested by EPA, HP and PRIDCO shall, within 30 days, designate and notify EPA of HP and PRIDCO's CI Coordinator (HP and PRIDCO's CI Coordinator). HP and PRIDCO may hire a contractor for this purpose. HP and PRIDCO's notice must include the name, title, and qualifications of HP and PRIDCO's CI Coordinator. HP and PRIDCO's CI Coordinator shall coordinate his/her activities with EPA's CI Coordinator, provide support regarding EPA's community involvement activities, and, as requested by EPA's CI Coordinator, provide draft responses to the public's inquiries including requests for information or data about the Site. HP and PRIDCO and their CI Coordinator have the responsibility to ensure that when they communicate with the public, HP and PRIDCO protect any "Personally Identifiable Information" ("PII") (e.g. sample results from residential properties) in accordance with "EPA Policy 2151.0: Privacy Policy."
- (c) As requested by EPA, HP and PRIDCO shall participate in community involvement activities, including participation in: (1) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site (with interpreters present for community members with limited English proficiency). HP and PRIDCO's support of EPA's community involvement activities will be addressed in the forthcoming CIP for the Site. All community involvement activities conducted by HP and PRIDCO at EPA's request are subject to EPA's oversight. Upon EPA's request, HP and PRIDCO shall support EPA in establishing, as early as is feasible, a community information repository at or near the Site, or online, to house one copy of the administrative record.
- (d) **Information for the Community.** As requested by EPA, HP and PRIDCO shall develop and provide to EPA information about the design and implementation of the remedy including: (1) any validated data from monitoring of impacts to communities as provided in the Community Impacts Mitigation Plan under ¶ 7.7(f); (2) results from unvalidated sampling as provided under ¶ 7.7(e)(7); (3) a copy of the Community Impacts Mitigation Plan required under ¶ 7.7(f); (4) schedules prepared under Section 8; (5) dates that HP and PRIDCO completed

each task listed in the schedules; and (6) representative digital photographs of the Work being performed, together with descriptions of the Work depicted in the photographs, the purpose of the Work, the equipment being used, and the location of the Work. The EPA Project Coordinator may use this information for communication to the public via EPA's website, social media, or local and mass media. The information provided to EPA should be suitable for sharing with the public and the education levels of the community as indicated in EJ Screen. Translations should be in the dominant language(s) of community members with limited English proficiency.

3. COORDINATION AND SUPERVISION

3.1 Project Coordinators

- (a) HP and PRIDCO's Project Coordinator must have sufficient technical expertise to coordinate the Work. HP and PRIDCO's Project Coordinator may not be an attorney representing Settling Defendant in this matter and may not act as the Supervising Contractor. HP and PRIDCO's Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.
- (b) EPA shall designate and notify HP and PRIDCO of EPA's Project Coordinator and Alternate Project Coordinator. EPA may designate other representatives, which may include its employees, contractors, and/or consultants, to oversee the Work. EPA's Project Coordinator/Alternate Project Coordinator will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This includes the authority to halt the Work and/or to conduct or direct any necessary response action when it is determined that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.
- (c) HP and PRIDCO's Project Coordinator shall communicate with EPA's Project Coordinator at least monthly.

3.2 Supervising Contractor. HP and PRIDCO's proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with the most recent version of *Quality Systems for Environmental Data and Technology Programs -- Requirements with Guidance for Use* (American National Standard), ANSI/ASQC E4 (Feb. 2014).

3.3 Procedures for Disapproval/Notice to Proceed

- (a) HP and PRIDCO shall designate, and notify EPA, within 30 days after the Effective Date of the Decree, of the name, title, contact information, and

qualifications of HP and PRIDCO's proposed Project Coordinator and Supervising Contractor, whose qualifications shall be subject to EPA's review.

- (b) EPA shall issue notices of disapproval and/or authorizations to proceed regarding any proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, HP and PRIDCO shall, within 30 days, submit to EPA a list of supplemental proposed Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. HP and PRIDCO may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of HP and PRIDCO's selection.
- (c) EPA may disapprove the proposed Project Coordinator, the Supervising Contractor, or both, based on objective assessment criteria (*e.g.*, experience, capacity, technical expertise), if they have a conflict of interest regarding the project, or any combination of these factors.
- (d) HP and PRIDCO may change their Project Coordinator and/or Supervising Contractor, or both, by following the procedures of ¶¶ 3.3(a) and 3.3(b).

4. REMEDIAL DESIGN

4.1 Remedial Design Work Plan ("RDWP"). HP and PRIDCO shall submit a RDWP for EPA approval. The RDWP must include:

- (a) Plans for implementing all Remedial Design activities identified in this SOW, in the RDWP, or required by EPA to be conducted to develop the Remedial Design;
- (b) A description of the overall management strategy for performing the Remedial Design, including a proposal for phasing of design and construction, if applicable;
- (c) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring of the Remedial Action as necessary to implement the Work;
- (d) A description of the responsibility and authority of all organizations and key personnel involved with the development of the Remedial Design;
- (e) Descriptions of any areas requiring clarification and/or anticipated problems (*e.g.*, data gaps);
- (f) Description of any proposed pre-design investigation, which might include:
 - (1) EISB bench scale study;
 - (2) Collection of soil/groundwater data to assess DPE;

- (3) TCE plume core, i.e., TCE concentrations greater than 100 ppb and TCE fringe, i.e., TCE concentrations between 5 ppb and 100 ppb, evaluation;
- (4) Vapor intrusion sampling;
- (g) Description of any proposed treatability study for EISB;
- (h) Descriptions of any applicable permitting requirements and other regulatory requirements;
- (i) Description of plans for obtaining access in connection with the Work, such as property acquisition, property leases, and/or easements; and
- (j) The following supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Health and Safety Plan (HASP), Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Emergency Response Plan.

4.2 Institutional Controls Implementation and Assurance Plan (“ICIAP”). HP and PRIDCO shall submit a proposed ICIAP for EPA approval. The ICIAP should describe plans to implement, maintain, monitor, and enforce the Institutional Controls (“ICs”) at the Site. The ICIAP shall include plans to commence implementing ICs as early as is feasible, including before EPA approval of the 100% design under ¶ 4.9. The ICIAP also should include procedures for effective and comprehensive review of implemented ICs, procedures for the solicitation of input from affected communities regarding the implementation of ICs, procedures to periodically review and determine if the ICs are having their intended effect, and if not, procedures for the development, approval and implementation of alternative, more effective ICs. HP and PRIDCO shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). HP and PRIDCO also shall consider including in the ICIAP the establishment of effective Long-Term Stewardship procedures including those described in EPA Memorandum: *Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship* (July 20, 2018). The ICIAP must include the following additional requirements:

- (a) Locations of recorded real property interests (*e.g.*, easements, liens) and resource interests in the property that may affect ICs (*e.g.*, surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and
- (b) Legal descriptions and survey maps that are prepared according to current American Land Title Association (“ALTA”) survey guidelines and certified by a licensed surveyor.

4.3 HP and PRIDCO shall communicate regularly with EPA to discuss design issues as necessary, as directed or determined by EPA.

4.4 Pre-Design Investigation (“PDI”). The purpose of the PDI is to address data gaps by conducting additional field investigations.

(a) **PDI Work Plan.** HP and PRIDCO shall submit a PDI Work Plan (“PDIWP”) for EPA approval. The PDIWP must include:

- (1) An evaluation and summary of existing data and description of data gaps;
- (2) A sampling plan including media to be sampled, contaminants or parameters for which sampling will be conducted, location (areal extent and depths), and number of samples; and
- (3) Cross references to quality assurance/quality control (“QA/QC”) requirements set forth in the Quality Assurance Project Plan (“QAPP”) as described in ¶ 7.7(d).

(b) Following the PDI, HP and PRIDCO shall submit a PDI Evaluation Report for approval. This report must include:

- (1) Summary of the investigations performed;
- (2) Summary of investigation results;
- (3) Summary of validated data (*i.e.*, tables and graphics);
- (4) Data validation reports and laboratory data reports;
- (5) Narrative interpretation of data and results;
- (6) Results of statistical and modeling analyses;
- (7) Photographs documenting the work conducted; and
- (8) Conclusions and recommendations for Remedial Design, including design parameters and criteria.

(c) EPA may require HP and PRIDCO to supplement the PDI Evaluation Report and/or to perform additional pre-design studies.

4.5 Treatability Study (“TS”).

(a) HP and PRIDCO shall perform a TS for the purpose of evaluating the efficacy of EISB. The TS will include a bench scale EISB/ DPE evaluation and an EISB pilot test. The EISB remedy will be considered effective at achieving the RAOs if the saturated saprolite zone parent VOC concentrations in select monitoring wells

show a decreasing trend over time using a Mann-Kendall or similar statistical analysis.

- (b) HP and PRIDCO shall submit a TS Work Plan (“TSWP”) for EPA approval. HP and PRIDCO shall prepare the TSWP in accordance with EPA’s *Guide for Conducting Treatability Studies under CERCLA, Final* (Oct. 1992), as supplemented for Remedial Design by the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). The TSWP may be combined with the PDIWP.
- (c) Following completion of the TS, HP and PRIDCO shall submit a TS Evaluation Report for EPA comment.
- (d) EPA may require HP and PRIDCO to supplement the TS Evaluation Report and/or to perform additional treatability studies.

4.6 Preliminary (30%) Remedial Design. HP and PRIDCO shall submit a Preliminary (30%) Remedial Design for EPA’s comment. The Preliminary Remedial Design must include:

- (a) A design criteria report, as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995);
- (b) Preliminary drawings and specifications;
- (c) Descriptions of permit requirements, if applicable;
- (d) Preliminary Operation and Maintenance (“O&M”) Plan and O&M Manual;
- (e) A description of how the Remedial Action will be implemented in a manner that minimizes environmental impacts in accordance with EPA’s *Principles for Greener Cleanups* (Aug. 2009);
- (f) A description of monitoring and control measures to protect human health and the environment, such as air monitoring, and measures to reduce and manage traffic, noise, odors, and dust, during the Remedial Action in accordance with the *Community Involvement Handbook* pp. 53-66 (text box on p. 55) to minimize community impacts;
- (g) Any proposed revisions to the Remedial Action Schedule that is set forth in ¶ 8.3 (Remedial Action Schedule); and
- (h) Updates of all supporting deliverables required to accompany the RDWP and the following additional supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Monitoring Plan; Community Impacts Mitigation Plan, Construction Quality Assurance/Quality Control Plan; Transportation and Off-Site Disposal Plan; O&M Plan; and O&M Manual.

- 4.7 Intermediate (60%) Remedial Design.** HP and PRIDCO shall submit the Intermediate (60%) Remedial Design for EPA’s comment. The Intermediate Remedial Design must: (a) be a continuation and expansion of the Preliminary Remedial Design; (b) address EPA’s comments regarding the Preliminary Remedial Design; and (c) include the same elements as are required for the Preliminary (30%) Remedial Design.
- 4.8 Pre-final (95%) Remedial Design.** HP and PRIDCO shall submit the Pre-final (95%) Remedial Design for EPA’s comment. The Pre-final Remedial Design must be a continuation and expansion of the previous design submittal and must address EPA’s comments regarding the Intermediate Remedial Design. The Pre-final Remedial Design will serve as the approved Final (100%) Remedial Design if EPA approves the Pre-final Remedial Design without comments. The Pre-final Remedial Design must include:
- (a) A complete set of construction drawings and specifications, if applicable, that are: (1) certified by a professional engineer registered in Puerto Rico; (2) suitable for procurement; and (3) follow the Construction Specifications Institute’s MasterFormat (2020);
 - (b) A survey and engineering drawings showing existing Site features, such as elements, property borders, easements, and Site conditions;
 - (c) Pre-final versions of the same elements and deliverables as are required for the Preliminary/Intermediate Remedial Design;
 - (d) A specification for photographic documentation of the Remedial Action; and
 - (e) Updates of all supporting deliverables required to accompany the Preliminary (30%) Remedial Design.
- 4.9 Final (100%) Remedial Design.** HP and PRIDCO shall submit the Final (100%) Remedial Design for EPA approval. The Final Remedial Design must address EPA’s comments on the Pre-final Remedial Design and must include final versions of all Pre-final Remedial Design deliverables.

5. REMEDIAL ACTION

- 5.1 Remedial Action Work Plan (“RAWP”).** HP and PRIDCO shall submit a RAWP for EPA approval that includes:
- (a) A proposed Remedial Action Construction Schedule in Gantt chart format that shows the critical path for the RA;
 - (b) An updated health and safety plan that covers activities during the Remedial Action; and

- (c) Plans for satisfying permitting requirements, including obtaining permits for off-site activity and for satisfying substantive requirements of permits for on-site activity.

5.2 Independent Quality Assurance Team (“IQAT”). HP and PRIDCO shall notify EPA of HP and PRIDCO’s designated IQAT. The IQAT must be independent of, and cannot include the Supervising Contractor. HP and PRIDCO may hire a third party for this purpose. HP and PRIDCO’ notice must include the names, titles, contact information, and qualifications of the members of the IQAT. The IQAT will have the responsibility to determine whether Work is of expected quality and conforms to applicable plans and specifications. The IQAT will have the responsibilities as described in ¶ 2.1.3 of the *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties*, EPA/540/G-90/001 (Apr. 1990).

5.3 Meetings and Inspections

- (a) **Preconstruction Conference.** HP and PRIDCO shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). HP and PRIDCO shall prepare minutes of the conference and shall distribute the minutes to all Parties.
- (b) **Periodic Communications.** During the construction portion of the Remedial Action (Remedial Action Construction), HP and PRIDCO shall communicate regularly (on a weekly basis) with EPA, and others as directed or determined by EPA, to discuss construction issues. HP and PRIDCO shall distribute an agenda and list of attendees to all Parties prior to each meeting or telephone call. HP and PRIDCO shall prepare minutes of the meetings or calls and shall distribute the minutes to all Parties.
- (c) **Inspections**
 - (1) EPA or its representative may conduct periodic inspections of or have an on-site presence during the Work. At EPA’s request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.
 - (2) PRIDCO shall provide office space within the Retiro Industrial Park for EPA personnel to perform their oversight duties. The minimum office requirements are a private lockable office with at least 150 square feet of floor space, electricity and water connection, air conditioning, an office desk with chair, a four-drawer file cabinet, wireless internet access, and sanitation facilities. PRIDCO may provide a single office space for oversight of both the Wallace Lot Work and CCL Lot Work unless an additional space is requested by EPA.

- (3) Upon notification by EPA of any deficiencies in the Remedial Action Construction, HP and PRIDCO shall take all necessary steps to correct the deficiencies and/or bring the Remedial Action Construction into compliance with the approved Final Remedial Design, any approved design changes, and/or the approved RAWP. If applicable, HP and PRIDCO shall comply with any schedule provided by EPA in its notice of deficiency.

5.4 Permits

- (a) As provided in CERCLA § 121(e), and Section 300.400(e) of the NCP, no permit is required for any portion of the Work conducted entirely on-site (*i.e.*, within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or Commonwealth permit or approval, HP and PRIDCO shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.
- (b) HP and PRIDCO may seek relief under the provisions of Section X (Force Majeure) of the Decree for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 5.4(a) and required for the Work, provided that submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.
- (c) Nothing in the Decree or this SOW constitutes a permit issued under any federal or Commonwealth statute or regulation.

5.5 Emergency Response and Reporting

- (a) **Emergency Action.** 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 and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, HP and PRIDCO shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 5.5(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under the SOW.
- (b) **Release Reporting.** Upon the occurrence of any event during performance of the Work that HP and PRIDCO are required to report under CERCLA § 103 or Section 304 of the Emergency Planning and Community Right-to-Know Act (“EPCRA”), HP and PRIDCO shall immediately notify the authorized EPA officer orally.

- (c) The “authorized EPA officer” for purposes of immediate oral notifications and consultations under ¶ 5.5(a) and ¶ 5.5(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or the EPA Region 2 Emergency Operations Center at 732-906-6850 (if neither EPA Project Coordinator is available), or the EPA Emergency Spill Reporting Hotline at (800) 424-8802 (if neither the Regional Duty Officer nor the EPA Project Coordinators are available).
- (d) For any event covered by ¶ 5.5(a) and ¶ 5.5(b), HP and PRIDCO shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.
- (e) The reporting requirements under ¶ 5.5 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

5.6 Off-Site Shipments

- (a) HP and PRIDCO may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with CERCLA § 121(d)(3), and 40 C.F.R. § 300.440. HP and PRIDCO will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if HP and PRIDCO obtain 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).
- (b) HP and PRIDCO may ship Waste Material from the Site to an out-of-Commonwealth waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility’s state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must 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. HP and PRIDCO also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-Commonwealth facility. HP and PRIDCO shall provide the notice after the award of the contract for Remedial Action construction and before the Waste Material is shipped.
- (c) HP and PRIDCO may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with CERCLA § 121(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

Record of Decision. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

5.7 Certification of Remedial Action Completion

- (a) **Remedial Action Completion Inspection.** The Remedial Action is “Complete” for purposes of this ¶ 5.7 when it has been fully performed and the Performance Standards have been achieved. HP and PRIDCO shall schedule a pre-certification inspection for the purpose of obtaining EPA’s Certification of Remedial Action Completion. The inspection must be attended by HP and PRIDCO and EPA and/or their representatives.
- (b) **Remedial Action Report.** Following the inspection, HP and PRIDCO shall submit a Remedial Action Report to EPA requesting EPA’s Certification of Remedial Action Completion. The report must: (1) include certifications by a registered professional engineer and by HP and PRIDCO’s Project Coordinator that the Remedial Action is complete; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA’s *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017); and (3) be certified in accordance with ¶ 7.5 (Certification).
- (c) If EPA concludes that the Remedial Action is not Complete, EPA shall so notify HP and PRIDCO in writing. EPA’s notice must include a description of any deficiencies. EPA’s notice may include a schedule for addressing such deficiencies or may require HP and PRIDCO to submit a schedule for EPA approval. HP and PRIDCO shall perform all activities described in the notice in accordance with the schedule.
- (d) If EPA concludes, based on the initial or any subsequent Remedial Action Report requesting Certification of Remedial Action Completion, that the Remedial Action is Complete, EPA shall so certify to HP and PRIDCO. This certification will constitute the Certification of Remedial Action Completion for purposes of the Decree, including Section XIII of the Decree (Covenants by Plaintiff). Certification of Remedial Action Completion will not affect HP and PRIDCO’s remaining obligations under the Decree.

- 5.8 **Periodic Review Support Plan (“PRSP”).** HP and PRIDCO shall submit the PRSP for EPA approval. The PRSP addresses the studies and investigations that HP and PRIDCO shall conduct to support EPA’s reviews of whether the Remedial Action is protective of human health and the environment in accordance with CERCLA § 121(c) (also known as “Five-Year Reviews”). HP and PRIDCO shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances.

5.9 Certification of Work Completion

- (a) **Work Completion Inspection.** HP and PRIDCO shall schedule an inspection for the purpose of obtaining EPA's Certification of Work Completion. The inspection must be attended by HP and PRIDCO and EPA and/or their representatives.
- (b) **Work Completion Report.** Following the inspection, HP and PRIDCO shall submit a report to EPA requesting EPA's Certification of Work Completion. The report must: (1) include certifications by a registered professional engineer and by HP and PRIDCO's Project Coordinator that the Work, including all O&M activities, is complete; and (2) be certified in accordance with ¶ 7.5 (Certification). If the Remedial Action Report submitted under ¶ 5.7(b) includes all elements required under this ¶ 5.9(b), then the Remedial Action Report suffices to satisfy all requirements under this ¶ 5.9(b).
- (c) If EPA concludes that the Work is not complete, EPA shall so notify HP and PRIDCO in writing. EPA's notice must include a description of the activities that HP and PRIDCO must perform to complete the Work. EPA's notice must include specifications and a schedule for such activities or must require HP and PRIDCO to submit specifications and a schedule for EPA approval. HP and PRIDCO shall perform all activities described in the notice or in the EPA-approved specifications and schedule.
- (d) If EPA concludes, based on the initial or any subsequent report requesting Certification of Work Completion, that the Work is complete, EPA shall so certify in writing to HP and PRIDCO. Issuance of the Certification of Work Completion does not affect the following continuing obligations: (1) activities under the Periodic Review Support Plan; (2) obligations under Sections VI (Property Requirements), and XVI (Records) of the Decree; (3) Institutional Controls obligations as provided in the ICIAP; and (4) reimbursement of EPA's Future Response Costs under Section IX (Payments for Response Costs) of the Decree.

6. REPORTING

6.1 Progress Reports. Commencing with the first month following lodging of the Decree and until EPA approves the Remedial Action Completion, HP and PRIDCO shall submit progress reports to EPA on a monthly basis, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:

- (a) The actions that have been taken toward achieving compliance with the Decree;
- (b) A summary of all results of sampling, tests, and all other data received or generated by HP and PRIDCO;
- (c) A description of all deliverables that HP and PRIDCO submitted to EPA;

- (d) A description of all activities relating to Remedial Action Construction that are scheduled for the next six weeks;
- (e) An updated Remedial Action Construction Schedule, together with information regarding percentage of completion, delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays;
- (f) A description of any modifications to the work plans or other schedules that HP and PRIDCO proposed or that have been approved by EPA; and
- (g) A description of all activities undertaken in support of the Community Involvement Plan (“CIP”) during the reporting period and those to be undertaken in the next six weeks.

6.2 Notice of Progress Report Schedule Changes. If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 6.1(d), changes, HP and PRIDCO shall notify EPA of such change at least seven days before performance of the activity.

7. DELIVERABLES

7.1 Applicability. HP and PRIDCO shall submit deliverables for EPA approval or for EPA comment as specified in the SOW. If neither is specified, the deliverable does not require EPA’s approval or comment. Paragraphs 7.2 (In Writing) through 7.4 (Technical Specifications) apply to all deliverables. Paragraph 7.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 7.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

7.2 In Writing. As provided in ¶ 64 of the Decree, all deliverables under this SOW must be in writing unless otherwise specified.

7.3 General Requirements for Deliverables. All deliverables must be submitted by the deadlines in the Remedial Design Schedule or Remedial Action Schedule, as applicable. HP and PRIDCO shall submit all deliverables to EPA in electronic form and two hard copies of final documents unless the Parties agree otherwise. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 7.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 7.5” by 11”, HP and PRIDCO shall also provide EPA with paper copies of such exhibits.

7.4 Technical Specifications

- (a) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (“EDD”) format. (EPA Region 2 EDD Format Version 4.) Electronic Data Submission (EDD) requirements can be found at

<https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission>. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

- (b) Spatial data, including spatially referenced data and geospatial data, should be submitted: (1) in either ESRI shapefile or computer-aided design (CAD) file format; and (2) 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/>.
- (c) 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.
- (d) Spatial data submitted by HP and PRIDCO does not, and is not intended to, define the boundaries of the Site.

7.5 Certification. All deliverables that require compliance with this paragraph must be signed by HP and PRIDCO’s Project Coordinator, or other responsible official of HP and PRIDCO, and must contain the following statement:

I certify under penalty of perjury 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.

7.6 Approval of Deliverables

(a) **Initial Submissions**

- (1) After review of any deliverable that is required to be submitted for EPA approval under the Decree or the 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 substantial disruption to the Work; 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 ¶ 7.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 7.6(a), HP and PRIDCO shall, within 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: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring HP and PRIDCO to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation.** Upon approval, approval upon conditions, or modification by EPA under ¶ 7.6(a) (Initial Submissions) or ¶ 7.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Decree; and (2) HP and PRIDCO shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted under ¶ 7.6(a) or ¶ 7.6(b) does not relieve HP and PRIDCO of any liability for stipulated penalties under Section XII (Stipulated Penalties) of the Decree.

(d) If: (1) an initially submitted deliverable contains a material defect and the conditions are met for modifying the deliverable under ¶ 7.6(a)(2); or (2) a resubmitted deliverable contains a material defect; then the material defect constitutes a lack of compliance for purposes of this Paragraph.

7.7 Supporting Deliverables. HP and PRIDCO shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. HP and PRIDCO shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 10 (References)). HP and PRIDCO shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

(a) **Health and Safety Plan (“HASP”).** The HASP describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. HP and PRIDCO shall develop the

HASP in accordance with EPA's *Emergency Responder Health and Safety Manual* and Occupational Safety and Health Administration ("OSHA") requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover Remedial Design activities and should be, as appropriate, updated to cover activities during the Remedial Action and updated to cover activities after Remedial Action completion. EPA does not approve the HASP but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

- (b) **Emergency Response Plan ("ERP").** The ERP must describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure, etc.). The ERP must include:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
 - (2) Plan and date(s) for meeting(s) with the local community, including local, Commonwealth, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
 - (3) Spill Prevention, Control, and Countermeasures ("SPCC") Plan (if applicable), consistent with the regulations under 40 C.F.R. part 112, describing measures to prevent, and contingency plans for, spills and discharges;
 - (4) Notification activities in accordance with ¶ 5.5(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under CERCLA § 103 or EPCRA § 304; and
 - (5) A description of all necessary actions to ensure compliance with ¶ 5.5 of the SOW in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.
- (c) **Field Sampling Plan ("FSP").** The FSP addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. HP and PRIDCO shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).
- (d) **Quality Assurance Project Plan ("QAPP").** The QAPP must include a detailed explanation of HP and PRIDCO's quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. HP and PRIDCO shall develop the QAPP in accordance with EPA

Directive CIO 2105.1 (Environmental Information Quality Policy, 2021), the most recent version of *Quality Management Systems for Environmental Information and Technology Programs – Requirements with Guidance for Use*, ASQ/ANSI E-4 (Feb. 2014, and *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002). HP and PRIDCO shall collect, produce, and evaluate all environmental information at the Site in accordance with the approved QAPP.

- (e) **Monitoring Plan (“MP”).** The purpose of the MP is to obtain baseline information regarding the extent of contamination in affected media at the Site (including the CCL Lot); to obtain information, through short- and long- term monitoring, about the movement of and changes in contamination throughout the Site, before and during implementation of the Remedial Action; to obtain information regarding contamination levels to determine whether Performance Standards are achieved; and to obtain information to determine whether to perform additional actions, including further Site monitoring. The MP must include:
- (1) Description of the environmental media to be monitored;
 - (2) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;
 - (3) Description of how performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;
 - (4) Description of verification sampling procedures;
 - (5) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, and monthly and annual reports to EPA and Commonwealth agencies;
 - (6) Description of proposed additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) in the event that results from monitoring devices indicate changed conditions (such as higher than expected concentrations of the contaminants of concern or groundwater contaminant plume movement);
 - (7) A plan to immediately provide to EPA any unvalidated sampling data from Community Areas as defined in ¶ 7.7(f) affected by the remedy that exceed removal management levels or three times remedial cleanup levels, whichever is lower; and

- (8) A plan to expedite sampling and analysis in Community Areas as defined in ¶ 7.7(f) affected by the remedy (particularly in situations where EPA determines that unvalidated sampling data indicates substantial exceedances of cleanup standards), including procedures for expedited analysis, validation, and communication of sampling results to affected communities.
- (f) **Community Impacts Mitigation Plan (“CIMP”).** The CIMP describes all activities to be performed: (1) to reduce and manage the impacts from remedy implementation (*e.g.*, air emissions, traffic, noise, odor, temporary or permanent relocation) on residential areas, schools, playgrounds, healthcare facilities, or recreational or impacted public areas (“Community Areas”) from and during remedy implementation, (2) to conduct monitoring, as needed, in Community Areas of impacts from remedy implementation, (3) to expeditiously communicate validated remedy implementation monitoring data, (4) to make adjustments during remedy implementation in order to further reduce and manage impacts from remedy implementation to affected Community Areas, (5) to expeditiously restore community resources damaged during remediation such as roads and culverts, and (6) to mitigate the economic effects that the Remedial Action will have on the community by structuring remediation contracts to allow more local business participation, if appropriate. The CIMP should contain information about impacts to Community Areas that is sufficient to assist EPA’s Project Coordinator in performing the evaluations recommended under the *Superfund Community Involvement Handbook*, OLEM 9230.0-51 (March 2020), pp. 53-56.
- (g) **Construction Quality Assurance Plan (“CQAP”) and Construction Quality Control Plan (“CQCP”).** The purpose of the CQAP is to describe planned and systemic activities that provide confidence that the Remedial Action construction will satisfy all plans, specifications, and related requirements, including quality objectives. The purpose of the CQCP is to describe the activities to verify that Remedial Action construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQAP/CQCP (“CQA/CP”) must:
- (1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/CP;
 - (2) Describe the Performance Standards required to be met to achieve Completion of the Remedial Action;
 - (3) Describe the activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;
 - (4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/CP;

- (5) Describe industry standards and technical specifications used in implementing the CQA/CP;
 - (6) Describe procedures for tracking construction deficiencies from identification through corrective action;
 - (7) Describe procedures for documenting all CQA/CP activities; and
 - (8) Describe procedures for retention of documents and for final storage of documents.
- (h) **O&M Plan.** The O&M Plan describes the requirements for inspecting, operating, and maintaining the Remedial Action. HP and PRIDCO shall develop the O&M Plan in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017). The O&M Plan must include the following additional requirements:
- (1) Description of Performance Standards required to be met to implement the Record of Decision;
 - (2) Description of activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;
 - (3) **O&M Reporting.** Description of records and reports that will be generated during O&M, such as daily operating logs, laboratory records, records of operating costs, reports regarding emergencies, personnel and maintenance records, monitoring reports, and monthly and annual reports to EPA and Commonwealth agencies;
 - (4) Description of corrective action in case of systems failure, including:
 - (i) alternative procedures to prevent the release or threatened release of Waste Material which may endanger public health and the environment or may cause a failure to achieve Performance Standards;
 - (ii) analysis of vulnerability and additional resource requirements should a failure occur;
 - (iii) notification and reporting requirements should O&M systems fail or be in danger of imminent failure; and
 - (iv) community notification requirements; and
 - (5) Description of corrective action to be implemented in the event that Performance Standards are not achieved; and a schedule for implementing these corrective actions.
- (i) **O&M Manual.** The O&M Manual serves as a guide to the purpose and function of the equipment and systems that make up the remedy. HP and PRIDCO shall develop the O&M Manual in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017).

8. SCHEDULES

8.1 Applicability and Revisions. All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Remedial Design and Remedial Action Schedules set forth below. HP and PRIDCO may submit proposed revised Remedial Design Schedules or Remedial Action Schedules for EPA approval. Upon EPA's approval, the revised Remedial Design and/or Remedial Action Schedules supersede the Remedial Design and Remedial Action Schedules set forth below, and any previously approved Remedial Design and/or Remedial Action Schedules.

8.2 Remedial Design Schedule

	Description of Deliverable, Task	¶ Ref.	Deadline
1	RDWP	4.1	120 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3).
2	ICIAP	4.2	120 days after EPA Authorization to Proceed regarding Supervising Contractor (¶ 3.3).
3	PDIWP	4.4(a)	120 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3).
4	TSWP	4.5(b)	120 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3).
5	PDI Evaluation Report	4.4(b)	60 days from last set of validated data
6	TS Evaluation Report	4.5(c)	60 days after completion of the TS
7	Preliminary (30%) Remedial Design	4.6	60 days after EPA approval of the PDI and TS Evaluation Report
8	Intermediate (60%) Remedial Design	4.7	60 days after EPA comments on Preliminary Remedial Design
9	Pre-final (90/95%) Remedial Design	4.8	30 days after EPA comments on Preliminary or Intermediate Remedial Design
10	Final (100%) Remedial Design	4.9	30 days after EPA comments on Pre-final Remedial Design

8.3 Remedial Action Schedule

	Description of Deliverable / Task	¶ Ref.	Deadline
1	Commence to Implement ICIAP	4.2	60 days after EPA Notice of Authorization to Proceed with ICIAP
2	Award Remedial Action contract		120 days after EPA Notice of Authorization to Proceed with Remedial Action
3	RAWP	5.1	210 days after EPA Notice of Authorization to Proceed with Remedial Action
4	Designate IQAT	5.2	210 days after EPA Notice of Authorization to Proceed with Remedial Action
5	Pre-Construction Conference	5.3(a)	15 days after Approval of RAWP
6	Start of Construction		90 days after Approval of RAWP
7	Completion of Construction		As defined in the RAWP
8	Remedial Action Completion Inspection	5.7(a)	30 days after Performance Standards have been fully achieved
9	Remedial Action Report	5.7(b)	30 days after the Remedial Action Completion Inspection
10	Periodic Review Support Plan	5.8	Five years after Start of Remedial Action Construction
11	Work Completion Report	5.9(b)	90 days after completion of all O&M work.

9. COMMONWEALTH PARTICIPATION

9.1 Copies. HP and PRIDCO shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the Commonwealth. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to HP and PRIDCO, send a copy of such document to the Commonwealth.

9.2 Review and Comment. The Commonwealth will have a reasonable opportunity for review and comment prior to:

- (a) Any EPA notice to proceed under ¶ 3.3 (Procedures for Disapproval/Notice to Proceed);
- (b) Any EPA approval or disapproval under ¶ 7.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and
- (c) Any disapproval of, or Certification of Remedial Action Completion under ¶ 5.7 (Certification of Remedial Action Completion), and any disapproval of, or

Certification of Work Completion under ¶ 5.9 (Certification of Work Completion).

10. REFERENCES

- 10.1** The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the three EPA web pages listed in ¶ 10.2:
- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).
 - (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
 - (c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).
 - (d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
 - (e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G90/001 (Apr. 1990).
 - (f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
 - (g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
 - (h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
 - (i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).
 - (j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. part 300 (Oct. 1994).
 - (k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).
 - (l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).

- (m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (n) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, EPA/540-R-01-007 (June 2001).
- (o) Guidance for Quality Assurance Project Plans, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002) <https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5>.
- (p) Institutional Controls: Third-Party Beneficiary Rights in Proprietary Controls, OECA (Apr. 2004).
- (q) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).
- (r) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).
- (s) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2005), <https://www.epa.gov/geospatial/epa-national-geospatial-data-policy>.
- (t) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).
- (u) Principles for Greener Cleanups (Aug. 2009), <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- (v) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).
- (w) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).
- (x) Recommended Evaluation of Institutional Controls: Supplement to the “Comprehensive Five-Year Review Guidance,” OSWER 9355.7-18 (Sep. 2011).
- (y) Plan EJ 2014: Legal Tools, EPA Office of General Counsel (Dec. 2011), <https://www.epa.gov/environmentaljustice/plan-ej-2014-legal-tools>.
- (z) Construction Specifications Institute’s MasterFormat (2020 edition), available from the Construction Specifications Institute, <http://www.csinet.org/masterformat>.
- (aa) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012)

- (bb) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), <https://semspub.epa.gov/work/HQ/175446.pdf>.
- (cc) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012), <https://semspub.epa.gov/work/HQ/175449.pdf>.
- (dd) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), <https://www.epaosc.org/HealthSafetyManual/manual-index.htm>.
- (ee) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).
- (ff) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).
- (gg) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).
- (hh) Quality Management Systems for Environmental Information and Technology Programs -- Requirements with Guidance for Use, ASQ/ANSI E-4 (February 2014), available at <https://webstore.ansi.org/>.
- (ii) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), <https://www.epa.gov/superfund/superfund-post-construction-completion>.
- (jj) Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship (July 20, 2018), <https://www.epa.gov/enforcement/use-advanced-monitoring-technologies-and-approaches-support-long-term-stewardship>.
- (kk) Superfund Community Involvement Handbook, OLEM 9230.0-51 (March 2020). More information on Superfund community involvement is available on the Agency's Superfund Community Involvement Tools and Resources web page at <https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources>.
- (ll) EPA directive CIO 2105.1 (Environmental Information Quality Policy, 2021), https://www.epa.gov/sites/production/files/2021-04/documents/environmental_information_quality_policy.pdf.

10.2 A more complete list may be found on the following EPA web pages:

- (a) Laws, Policy, and Guidance at <https://www.epa.gov/superfund/superfund-policy-guidance-and-laws>;

- (b) Search Superfund Documents at <https://www.epa.gov/superfund/search-superfund-documents>; and
- (c) Test Methods Collections at: <https://www.epa.gov/measurements/collection-methods>.

10.3 For any regulation or guidance referenced in the Decree or SOW, 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 HP and PRIDCO receive notification from EPA of the modification, amendment, or replacement.

APPENDIX C

REMEDIAL DESIGN/REMEDIAL ACTION

STATEMENT OF WORK

Operable Unit 1

Wallace Lot

San German Groundwater Contamination Superfund Site

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1. INTRODUCTION

- 1.1 Purpose of SOW.** This SOW sets forth the procedures and requirements for implementing the Work at the Wallace Lot consistent with Section V of the Consent Decree (“Decree”).
- 1.2 Structure of the SOW**
- Section 2 (Community Involvement) sets forth EPA’s and Wallace and PRIDCO’s responsibilities for community involvement.
 - Section 3 (Coordination and Supervision) contains the provisions for selecting the Supervising Contractor and Project Coordinators regarding the Work.
 - Section 4 (Remedial Design) sets forth the process for developing the Remedial Design, which includes the submission of specified primary deliverables.
 - Section 5 (Remedial Action) sets forth requirements regarding the completion of the Remedial Action, including primary deliverables related to completion of the Remedial Action.
 - Section 6 (Reporting) sets forth Wallace and PRIDCO’s reporting obligations.
 - Section 7 (Deliverables) describes the contents of the supporting deliverables and the general requirements regarding Wallace and PRIDCO’s submission of, and EPA’s review of, approval of, comment on, and/or modification of, the deliverables.
 - Section 8 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the Remedial Action.
 - Section 9 (Commonwealth Participation) addresses Commonwealth participation.
 - Section 10 (References) provides a list of references, including URLs.
- 1.3** The scope of the remedy includes the actions described in the OU1 Record of Decision, including soil vapor extraction for the vadose zone, and dual-phase extraction and/or *in-situ* treatment for the shallow saprolite zone (*e.g.*, enhanced anaerobic biodegradation), as applicable to the Wallace Lot. The extent to which each of these components of the remedy will be implemented will be based on the outcomes of pre-design investigations and/or treatability and pilot testing. It is understood that the vapor intrusion data already being collected by Wallace will be evaluated in the context of the OU1 remedy implementation.
- 1.4** The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Decree, have the meanings assigned to them in CERCLA, in such regulations, or in the Decree, except that the term “Paragraph” or “¶” means a paragraph of the SOW, and the term “Section” means a section of the SOW, unless otherwise stated.

2. COMMUNITY INVOLVEMENT

2.1 As requested by EPA, Wallace and PRIDCO shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with this Section. Such activities may include designation of a Community Involvement Coordinator ("CI Coordinator").

2.2 Community Involvement Responsibilities

- (a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. EPA will develop a Community Involvement Plan ("CIP") for the Site in accordance with 40 C.F.R. § 300.435(c), to describe public involvement activities during the Work.
- (b) **Wallace and PRIDCO's CI Coordinator.** If requested by EPA, Wallace and PRIDCO shall, within 30 days, designate and notify EPA of Wallace and PRIDCO's CI Coordinator (Wallace and PRIDCO's CI Coordinator). Wallace and PRIDCO may hire a contractor for this purpose. Wallace and PRIDCO's notice must include the name, title, and qualifications of Wallace and PRIDCO's CI Coordinator. Wallace and PRIDCO's CI Coordinator shall coordinate his/her activities with EPA's CI Coordinator, provide support regarding EPA's community involvement activities, and, as requested by EPA's CI Coordinator, provide draft responses to the public's inquiries including requests for information or data about the Site. Wallace and PRIDCO and their CI Coordinator have the responsibility to ensure that when they communicate with the public, Wallace and PRIDCO protect any "Personally Identifiable Information" ("PII") (e.g. sample results from residential properties) in accordance with "EPA Policy 2151.0: Privacy Policy."
- (c) As requested by EPA, Wallace and PRIDCO shall participate in community involvement activities, including participation in public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site (with interpreters present for community members with limited English proficiency). Wallace and PRIDCO's support of EPA's community involvement activities will be addressed in the forthcoming CIP for the Site. All community involvement activities conducted by Wallace and PRIDCO at EPA's request are subject to EPA's oversight. Upon EPA's request, Wallace and PRIDCO shall support EPA in establishing, as early as is feasible, a community information repository at or near the Site or online, to house one copy of the administrative record.
- (d) **Information for the Community.** As requested by EPA, Wallace and PRIDCO shall develop and provide to EPA information about the design and implementation of the remedy including: (1) any validated data from monitoring of impacts to communities as provided in the Community Impacts Mitigation Plan under ¶ 7.7(f); (2) results from unvalidated sampling as provided under ¶ 7.7(e)(7); (3) a copy of the Community Impacts Mitigation Plan required under ¶ 7.7(f); (4) schedules prepared under Section 8; (5) dates that Wallace and

PRIDCO completed each task listed in the schedules; and (6) representative digital photographs of the Work being performed, together with descriptions of the Work depicted in the photographs, the purpose of the Work, the equipment being used, and the location of the Work. The EPA Project Coordinator may use this information for communication to the public via EPA's website, social media, or local and mass media. The information provided to EPA should be suitable for sharing with the public and the education levels of the community as indicated in EJ Screen. Translations should be in the dominant language(s) of community members with limited English proficiency.

3. COORDINATION AND SUPERVISION

3.1 Project Coordinators

- (a) Wallace and PRIDCO's Project Coordinator must have sufficient technical expertise to coordinate the Work. Wallace and PRIDCO's Project Coordinator may not be an attorney representing any Settling Defendant in this matter and may not act as the Supervising Contractor. Wallace and PRIDCO's Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.
- (b) EPA shall designate and notify Wallace and PRIDCO of EPA's Project Coordinator and Alternate Project Coordinator. EPA may designate other representatives, which may include its employees, contractors, and/or consultants, to oversee the Work. EPA's Project Coordinator/Alternate Project Coordinator will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This includes the authority to halt the Work and/or to conduct or direct any necessary response action when it is determined that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.
- (c) Wallace and PRIDCO's Project Coordinator shall communicate with EPA's Project Coordinator at least monthly.

3.2 Supervising Contractor. Wallace and PRIDCO's proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with the most recent version of *Quality Systems for Environmental Data and Technology Programs -- Requirements with Guidance for Use* (American National Standard), ANSI/ASQC E4 (Feb. 2014).

3.3 Procedures for Disapproval/Notice to Proceed

- (a) Wallace and PRIDCO shall designate, and notify EPA, within 30 days after the Effective Date of the Decree, of the name, title, contact information, and qualifications of Wallace and PRIDCO's proposed Project Coordinator and Supervising Contractor, whose qualifications shall be subject to EPA's review.

- (b) EPA shall issue notices of disapproval and/or authorizations to proceed regarding any proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, Wallace and PRIDCO shall, within 30 days, submit to EPA a list of supplemental proposed Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. Wallace and PRIDCO may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of Wallace and PRIDCO's selection.
- (c) EPA may disapprove the proposed Project Coordinator, the Supervising Contractor, or both, based on objective assessment criteria (*e.g.*, experience, capacity, technical expertise), if they have a conflict of interest regarding the project, or any combination of these factors.
- (d) Wallace and PRIDCO may change their Project Coordinator and/or Supervising Contractor, or both, by following the procedures of ¶¶ 3.3(a) and 3.3(b).

4. REMEDIAL DESIGN

4.1 Remedial Design Work Plan ("RDWP"). Wallace and PRIDCO shall submit a RDWP for EPA approval. The RDWP must include:

- (a) Plans for implementing all Remedial Design activities identified in this SOW, in the RDWP, or required by EPA to be conducted to develop the Remedial Design;
- (b) A description of the overall management strategy for performing the Remedial Design, including a proposal for phasing of design and construction, if applicable;
- (c) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring of the Remedial Action as necessary to implement the Work;
- (d) A description of the responsibility and authority of all organizations and key personnel involved with the development of the Remedial Design;
- (e) Descriptions of any areas requiring clarification and/or anticipated problems (*e.g.*, data gaps);
- (f) Descriptions of any applicable permitting requirements and other regulatory requirements;
- (g) Description of plans for obtaining access in connection with the Work, such as property acquisition, property leases, and/or easements; and
- (h) The following supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Health and Safety Plan, Emergency Response Plan, Field Sampling Plan, and Quality Assurance Project Plan.

4.2 Institutional Controls Implementation and Assurance Plan (“ICIAP”). Wallace and PRIDCO shall submit a proposed ICIAP for EPA approval. The ICIAP should describe plans to implement, maintain, monitor, and enforce the Institutional Controls (“ICs”) at the Site. The ICIAP shall include plans to commence implementing ICs as early as is feasible, including before EPA approval of the 100% design under ¶ 4.9. The ICIAP also should include procedures for effective and comprehensive review of implemented ICs, procedures for the solicitation of input from affected communities regarding the implementation of ICs, procedures to periodically review and determine if the ICs are having their intended effect, and if not, procedures for the development, approval and implementation of alternative, more effective ICs. Wallace and PRIDCO shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). Wallace and PRIDCO also shall consider including in the ICIAP the establishment of effective Long-Term Stewardship procedures including those described in EPA Memorandum: *Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship* (July 20, 2018). The ICIAP must include the following additional requirements:

- (a) Locations of recorded real property interests (*e.g.*, easements, liens) and resource interests in the property that may affect ICs (*e.g.*, surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and
- (b) Legal descriptions and survey maps that are prepared according to current American Land Title Association (“ALTA”) Survey guidelines and certified by a licensed surveyor.

4.3 Wallace and PRIDCO shall communicate regularly with EPA to discuss design issues as necessary, as directed or determined by EPA.

4.4 Supplemental Pre-Design Investigation (“SPDI”). The purpose of the SPDI is to address data gaps by conducting additional field investigations.

- (a) **SPDI Work Plan.** Wallace and PRIDCO shall submit an SPDI Work Plan (“SPDIWP”) for EPA approval. The SPDIWP could be combined with the Pilot Study Work Plan. The SPDIWP must include:
 - (1) An evaluation and summary of existing data and description of data gaps;
 - (2) A sampling plan including media to be sampled related to contamination from the Wallace Lot, including soil vapor and indoor air, contaminants or parameters for which sampling will be conducted, location (areal extent and depths), and number of samples; and

- (3) Cross references to quality assurance/quality control (“QA/QC”) requirements set forth in the Quality Assurance Project Plan (“QAPP”) as described in ¶7.7(d).
- (b) Following the SPDI, Wallace and PRIDCO shall submit an SPDI Evaluation Report for approval. The SPDI Evaluation Report could be combined with the Pilot Study Evaluation Report. This report must include:
 - (1) Summary of the investigations performed;
 - (2) Summary of investigation results;
 - (3) Summary of validated data (i.e., tables and graphics);
 - (4) Data validation reports and laboratory data reports;
 - (5) Narrative interpretation of data and results;
 - (6) Results of statistical and modeling analyses;
 - (7) Photographs documenting the work conducted; and
 - (8) Conclusions and recommendations for Remedial Design, including design parameters and criteria and need for additional vapor intrusion sampling.
 - (c) EPA may require Wallace and PRIDCO to supplement the SPDI Evaluation Report and/or to perform additional pre-design studies.

4.5 Pilot Study (“PS”).

- (a) Wallace and PRIDCO will revise the existing Pilot Study Work Plan to address subsurface characteristics and the distribution of contaminants. The pilot test will include on-site pilot testing and may be supplemented by bench-scale treatability testing.
- (b) Wallace and PRIDCO shall submit a Pilot Study Work Plan (“PSWP”) for EPA review and approval. The PSWP could be combined with the SPDIWP.
- (c) Following completion of the PS, Wallace and PRIDCO shall submit a PS evaluation report for EPA comment. The PS Report could be combined with the SPDI Report.
- (d) EPA may require Wallace and PRIDCO to supplement the PS Evaluation Report and/or to perform additional pilot studies.

4.6 Preliminary (30%) Remedial Design. Wallace and PRIDCO shall submit a Preliminary (30%) Remedial Design for EPA’s comment. The Preliminary Remedial Design must include:

- (a) A design criteria report, as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995);
- (b) Preliminary drawings and specifications;
- (c) Descriptions of permit requirements, if applicable;
- (d) Preliminary Operation and Maintenance (“O&M”) Plan and O&M Manual;
- (e) A description of how the Remedial Action will be implemented in a manner that minimizes environmental impacts in accordance with EPA’s *Principles for Greener Cleanups* (Aug. 2009);
- (f) A description of monitoring and control measures to protect human health and the environment, such as indoor and outdoor air monitoring related to contamination from the Wallace Lot, and measures to reduce and manage traffic, noise, odors, and dust, during the Remedial Action in accordance with the Community Involvement Handbook pp. 53-66 (text box on p. 55) to minimize community impacts to the extent practicable;
- (g) Any proposed revisions to the Remedial Action Schedule that is set forth in ¶ 8.3 (Remedial Action Schedule); and
- (h) Updates of all supporting deliverables required to accompany the RDWP and the following additional supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Field Sampling Plan; Quality Assurance Project Plan; Monitoring Plan; Community Impacts Mitigation Plan; and O&M Plan.

4.7 Intermediate (60%) Remedial Design. Wallace and PRIDCO shall submit the Intermediate (60%) Remedial Design for EPA’s comment. The Intermediate Remedial Design must: (a) be a continuation and expansion of the Preliminary Remedial Design; (b) address EPA’s comments regarding the Preliminary Remedial Design; and (c) include the same elements as are required for the Preliminary (30%) Remedial Design.

4.8 Pre-final (95%) Remedial Design. Wallace and PRIDCO shall submit the Pre-final (95%) Remedial Design for EPA’s comment. The Pre-final Remedial Design must be a continuation and expansion of the previous design submittal and must address EPA’s comments regarding the Intermediate Remedial Design. The Pre-final Remedial Design will serve as the approved Final (100%) Remedial Design if EPA approves the Pre-final Remedial Design without comments. The Pre-final Remedial Design must include:

- (a) A complete set of construction drawings and specifications, if applicable, that are: (1) certified by a professional engineer registered in Puerto Rico; (2) suitable for procurement; and (3) follow the Construction Specifications Institute’s MasterFormat (2020 edition);
- (b) A survey and engineering drawings showing existing Site features, such as elements, property borders, easements, and Site conditions;

- (c) Pre-final versions of the same elements and deliverables as are required for the Preliminary/Intermediate Remedial Design;
- (d) A specification for photographic documentation of the Remedial Action; and
- (e) Updates of all supporting deliverables required to accompany the Preliminary (30%) Remedial Design.

4.9 Final (100%) Remedial Design. Wallace and PRIDCO shall submit the Final (100%) Remedial Design for EPA approval. The Final Remedial Design must address EPA's comments on the Pre-final Remedial Design and must include final versions of all Pre-final Remedial Design deliverables.

5. REMEDIAL ACTION

5.1 Remedial Action Work Plan ("RAWP"). Wallace and PRIDCO shall submit a RAWP for EPA approval that includes:

- (a) A proposed Remedial Action Construction Schedule in Gantt chart format that shows the critical path for the RA; and
- (b) An updated health and safety plan that covers activities during the Remedial Action.
- (c) Plans for satisfying permitting requirements, including obtaining permits for off-site activity and for satisfying substantive requirements of permits for on-site activity.

5.2 Independent Quality Assurance Team ("IQAT"). Wallace and PRIDCO shall notify EPA of Wallace and PRIDCO's designated IQAT. The IQAT must be independent of, and cannot include the Supervising Contractor. Wallace and PRIDCO may hire a third party for this purpose. Wallace and PRIDCO's notice must include the names, titles, contact information, and qualifications of the members of the IQAT. The IQAT will have the responsibility to determine whether Work is of expected quality and conforms to applicable plans and specifications. The IQAT will have the responsibilities as described in ¶ 2.1.3 of the Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, EPA/540/G-90/001 (Apr. 1990).

5.3 Meetings and Inspections

- (a) **Preconstruction Conference.** Wallace and PRIDCO shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). Wallace and PRIDCO shall prepare minutes of the conference and shall distribute the minutes to all Parties.
- (b) **Periodic Communications.** During the construction portion of the Remedial Action (Remedial Action Construction), Wallace and PRIDCO shall

communicate regularly (on a weekly basis) with EPA, and others as directed or determined by EPA, to discuss construction issues. Wallace and PRIDCO shall distribute an agenda and list of attendees to all Parties prior to each meeting or telephone call. Wallace and PRIDCO shall prepare minutes of the meetings or calls and shall distribute the minutes to all Parties.

(c) **Inspections**

- (1) EPA or its representative may conduct periodic inspections of or have an on-site presence during the Work. At EPA's request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.
- (2) PRIDCO shall provide office space within the Retiro Industrial Park for EPA personnel to perform their oversight duties. The minimum office requirements are a private lockable office with at least 150 square feet of floor space, electricity and water connection, air conditioning, an office desk with chair, a four-drawer file cabinet, wireless internet access, and sanitation facilities. PRIDCO may provide a single office space for oversight of both the Wallace Lot Work and CCL Lot Work unless an additional space is requested by EPA.
- (3) Upon notification by EPA of any deficiencies in the Remedial Action Construction, Wallace and PRIDCO shall take all necessary steps to correct the deficiencies and/or bring the Remedial Action Construction into compliance with the approved Final Remedial Design, any approved design changes, and/or the approved RAWP. If applicable, Wallace and PRIDCO shall comply with any schedule provided by EPA in its notice of deficiency.

5.4 Permits

- (a) As provided in CERCLA § 121(e), and Section 300.400(e) of the NCP, no permit is required for any portion of the Work conducted entirely on-site (*i.e.*, within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or Commonwealth permit or approval, Wallace and PRIDCO shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.
- (b) Wallace and PRIDCO may seek relief under the provisions of Section X (Force Majeure) of the Decree for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 5.4(a) and required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

- (c) Nothing in the Decree or this SOW constitutes a permit issued under any federal or Commonwealth statute or regulation.

5.5 Emergency Response and Reporting

- (a) **Emergency Action.** 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 and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Wallace and PRIDCO shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 5.5(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under the SOW.
- (b) **Release Reporting.** Upon the occurrence of any event during performance of the Work that Wallace and PRIDCO are required to report under CERCLA § 103 or Section 304 of the Emergency Planning and Community Right-to-Know Act (“EPCRA”), Wallace and PRIDCO shall immediately notify the authorized EPA officer orally.
- (c) The “authorized EPA officer” for purposes of immediate oral notifications and consultations under ¶ 5.5(a) and ¶ 5.5(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or the EPA Region 2 Emergency Operations Center at (732) 906-6850 (if neither EPA Project Coordinator is available), or the EPA Emergency Spill Reporting Hotline at (800) 424-8802 (if neither the Regional Duty Officer nor the EPA Project Coordinators are available).
- (d) For any event covered by ¶ 5.5(a) and ¶ 5.5(b), Wallace and PRIDCO shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.
- (e) The reporting requirements under ¶ 5.5 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

5.6 Off-Site Shipments

- (a) Wallace and PRIDCO may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with CERCLA § 121(d)(3), and 40 C.F.R. § 300.440. Wallace and PRIDCO will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Wallace and PRIDCO obtain 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).

- (b) Wallace and PRIDCO may ship Waste Material from the Site to an out-of-Commonwealth waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must 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. Wallace and PRIDCO also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-Commonwealth facility. Wallace and PRIDCO shall provide the notice after the award of the contract for Remedial Action construction and before the Waste Material is shipped.
- (c) Wallace and PRIDCO may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with CERCLA § 121(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 Record of Decision. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

5.7 Certification of Remedial Action Completion

- (a) **Remedial Action Completion Inspection.** The Remedial Action is "Complete" for purposes of this ¶ 5.7 when it has been fully performed and the Performance Standards have been achieved. Wallace and PRIDCO shall schedule a pre-certification inspection for the purpose of obtaining EPA's Certification of Remedial Action Completion. The inspection must be attended by Wallace and PRIDCO and EPA and/or their representatives.
- (b) **Remedial Action Report.** Following the inspection, Wallace and PRIDCO shall submit a Remedial Action Report to EPA requesting EPA's Certification of Remedial Action Completion. The report must: (1) include certifications by a registered professional engineer and by Wallace and PRIDCO's Project Coordinator that the Remedial Action is complete; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017); and (3) be certified in accordance with ¶ 7.5 (Certification).
- (c) If EPA concludes that the Remedial Action is not Complete, EPA shall so notify Wallace and PRIDCO in writing. EPA's notice must include a description of any deficiencies. EPA's notice may include a schedule for addressing such deficiencies or may require Wallace and PRIDCO to submit a schedule for EPA

approval. Wallace and PRIDCO shall perform all activities described in the notice in accordance with the schedule.

- (d) If EPA concludes, based on the initial or any subsequent Remedial Action Report requesting Certification of Remedial Action Completion, that the Remedial Action is Complete, EPA shall so certify to Wallace and PRIDCO. This certification will constitute the Certification of Remedial Action Completion for purposes of the Decree, including Section **XIII** of the Decree (Covenants by Plaintiff). Certification of Remedial Action Completion will not affect Wallace and PRIDCO's remaining obligations under the Decree.

5.8 Periodic Review Support Plan ("PRSP"). Wallace and PRIDCO shall submit the PRSP for EPA approval. The PRSP addresses the studies and investigations that Wallace and PRIDCO shall conduct to support EPA's reviews of whether the Remedial Action is protective of human health and the environment in accordance with CERCLA § 121(c) (also known as "Five-Year Reviews"). Wallace and PRIDCO shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances.

5.9 Certification of Work Completion

- (a) **Work Completion Inspection.** Wallace and PRIDCO shall schedule an inspection for the purpose of obtaining EPA's Certification of Work Completion. The inspection must be attended by Wallace and PRIDCO and EPA and/or their representatives.
- (b) **Work Completion Report.** Following the inspection, Wallace and PRIDCO shall submit a report to EPA requesting EPA's Certification of Work Completion. The report must: (1) include certifications by a registered professional engineer and by Wallace and PRIDCO's Project Coordinator that the Work, including all O&M activities, is complete; and (2) be certified in accordance with ¶ 7.5 (Certification). If the Remedial Action Report submitted under ¶ 5.7(b) includes all elements required under this ¶ 5.9(b), then the Remedial Action Report suffices to satisfy all requirements under this ¶ 5.9(b).
- (c) If EPA concludes that the Work is not complete, EPA shall so notify Wallace and PRIDCO in writing. EPA's notice must include a description of the activities that Wallace and PRIDCO must perform to complete the Work. EPA's notice must include specifications and a schedule for such activities or must require Wallace and PRIDCO to submit specifications and a schedule for EPA approval. Wallace and PRIDCO shall perform all activities described in the notice or in the EPA-approved specifications and schedule.
- (d) If EPA concludes, based on the initial or any subsequent report requesting Certification of Work Completion, that the Work is complete, EPA shall so certify in writing to Wallace and PRIDCO. Issuance of the Certification of Work Completion does not affect the following continuing obligations: (1) activities

under the Periodic Review Support Plan; (2) obligations under Sections **VI** (Property Requirements), and **XVI** (Records) of the Decree; (3) Institutional Controls obligations as provided in the ICIAP; and (4) reimbursement of EPA's Future Response Costs under Section **IX** (Payments for Response Costs) of the Decree.

6. REPORTING

- 6.1 Progress Reports.** Commencing with the first month following lodging of the Decree and until EPA approves the Remedial Action Completion, Wallace and PRIDCO shall submit progress reports to EPA on a monthly basis, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:
- (a) The actions that have been taken toward achieving compliance with the Decree;
 - (b) A summary of all results of sampling, tests, and all other data received or generated by Wallace and PRIDCO;
 - (c) A description of all deliverables that Wallace and PRIDCO submitted to EPA;
 - (d) A description of all activities relating to Remedial Action Construction that are scheduled for the next six weeks;
 - (e) An updated Remedial Action Construction Schedule, together with information regarding percentage of completion, delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays;
 - (f) A description of any modifications to the work plans or other schedules that Wallace and PRIDCO have proposed or that have been approved by EPA; and
 - (g) A description of all activities undertaken in support of the Community Involvement Plan ("CIP") during the reporting period and those to be undertaken in the next six weeks.
- 6.2 Notice of Progress Report Schedule Changes.** If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 6.1(d), changes, Wallace and PRIDCO shall notify EPA of such change at least seven days before performance of the activity.

7. DELIVERABLES

- 7.1 Applicability.** Wallace and PRIDCO shall submit deliverables for EPA approval or for EPA comment as specified in the SOW. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 7.2 (In Writing) through 7.4 (Technical Specifications) apply to all deliverables. Paragraph 7.5 (Certification) applies to any

deliverable that is required to be certified. Paragraph 7.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

7.2 In Writing. As provided in ¶ 64 of the Decree, all deliverables under this SOW must be in writing unless otherwise specified.

7.3 General Requirements for Deliverables. All deliverables must be submitted by the deadlines in the Remedial Design Schedule or Remedial Action Schedule, as applicable. Wallace and PRIDCO shall submit all deliverables to EPA in electronic form and two hard copies of final documents unless the Parties agree otherwise. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 7.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5” by 11”, Wallace and PRIDCO shall also provide EPA with paper copies of such exhibits.

7.4 Technical Specifications

- (a) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (“EDD”) format. (EPA Region 2 EDD Format Version 4.) Electronic Data Submission (EDD) requirements can be found at <https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission>. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.
- (b) Spatial data, including spatially referenced data and geospatial data, should be submitted: (1) in either ESRI shapefile or computer-aided design (CAD) file format, and (2) 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/>.
- (c) 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.
- (d) Spatial data submitted by Wallace and PRIDCO does not, and is not intended to, define the boundaries of the Site.

7.5 Certification. All deliverables that require compliance with this paragraph must be signed by Wallace and PRIDCO’s Project Coordinator, or other responsible official of Wallace and PRIDCO, and must contain the following statement:

I certify under penalty of perjury 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.

7.6 Approval of Deliverables

(a) Initial Submissions

- (1) After review of any deliverable that is required to be submitted for EPA approval under the Decree or the 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 substantial disruption to the Work; 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 ¶ 7.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 7.6(a), Wallace and PRIDCO shall, within 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: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring Wallace and PRIDCO to correct the deficiencies; or (5) any combination of the foregoing.

- (c) **Implementation.** Upon approval, approval upon conditions, or modification by EPA under ¶ 7.6(a) (Initial Submissions) or ¶ 7.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Decree; and (2) Wallace and PRIDCO shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted under ¶ 7.6(a) or ¶ 7.6(b) does not relieve Wallace and PRIDCO of

any liability for stipulated penalties under Section **XII** (Stipulated Penalties) of the Decree.

- (d) If: (1) an initially submitted deliverable contains a material defect and the conditions are met for modifying the deliverable under ¶ 7.6(a)(2); or (2) a resubmitted deliverable contains a material defect; then the material defect constitutes a lack of compliance for purposes of this Paragraph.

7.7 Supporting Deliverables. Wallace and PRIDCO shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. Wallace and PRIDCO shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 10 (References)). Wallace and PRIDCO shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

- (a) **Health and Safety Plan (“HASP”).** The HASP describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. Wallace and PRIDCO shall develop the HASP in accordance with EPA’s *Emergency Responder Health and Safety Manual* and Occupational Safety and Health Administration (“OSHA”) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover Remedial Design activities and should be, as appropriate, updated to cover activities during the Remedial Action and updated to cover activities after Remedial Action completion. EPA does not approve the HASP but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.
- (b) **Emergency Response Plan (“ERP”).** The ERP must describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure, etc.). The ERP must include:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
 - (2) Plan and date(s) for meeting(s) with the local community, including local, Commonwealth, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
 - (3) Spill Prevention, Control, and Countermeasures (“SPCC”) Plan (if applicable), consistent with the regulations under 40 C.F.R. part 112, describing measures to prevent, and contingency plans for, spills and discharges;
 - (4) Notification activities in accordance with ¶ 5.5(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under CERCLA § 103 or EPCRA § 304; and

- (5) A description of all necessary actions to ensure compliance with ¶ 5.5 of the SOW in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.
- (c) **Field Sampling Plan (“FSP”).** The FSP addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. Wallace and PRIDCO shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).
- (d) **Quality Assurance Project Plan (“QAPP”).** The QAPP must include a detailed explanation of Wallace and PRIDCO’s quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. Wallace and PRIDCO shall develop the QAPP in accordance with EPA Directive CIO 2105.1 (Environmental Information Quality Policy, 2021), the most recent version of *Quality Management Systems for Environmental Information and Technology Programs – Requirements with Guidance for Use*, ASQ/ANSI E-4 (Feb. 2014, and *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002). Wallace and PRIDCO shall collect, produce, and evaluate all environmental information at the Site in accordance with the approved QAPP.
- (e) **Monitoring Plan (“MP”).** The purpose of the MP is to obtain baseline information regarding the extent of contamination in affected media at the Site (including the Wallace Lot); to obtain information, through short- and long- term monitoring, about the movement of and changes in contamination throughout the Wallace Lot, before and during implementation of the Remedial Action; to obtain information regarding contamination levels to determine whether Performance Standards are achieved; and to obtain information to determine whether to perform additional actions, including further Wallace Lot monitoring. The MP must include:
 - (1) Description of the environmental media to be monitored;
 - (2) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;
 - (3) Description of how performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;
 - (4) Description of verification sampling procedures;

- (5) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, and monthly and annual reports to EPA and Commonwealth agencies;
 - (6) Description of proposed additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) in the event that results from monitoring devices indicate changed conditions (such as higher than expected concentrations of the contaminants of concern or groundwater contaminant plume movement);
 - (7) A plan to immediately provide to EPA any unvalidated sampling data from Community Areas as defined in ¶ 7.7(f) affected by the remedy that exceed removal management levels or three times remedial cleanup levels, whichever is lower; and
 - (8) A plan to expedite sampling and analysis in Community Areas as defined in ¶ 7.7(f) affected by the remedy (particularly in situations where EPA determines that unvalidated sampling data indicates substantial exceedances of cleanup standards), including procedures for expedited analysis, validation, and communication of sampling results to affected communities.
- (f) **Community Impacts Mitigation Plan (“CIMP”).** The CIMP describes all activities to be performed: (1) to reduce and manage the impacts from remedy implementation (*e.g.*, air emissions, traffic, noise, odor, temporary or permanent relocation) on residential areas, schools, playgrounds, healthcare facilities, or recreational or impacted public areas (“Community Areas”) from and during remedy implementation, (2) to conduct monitoring, as needed, in Community Areas of impacts from remedy implementation, (3) to expeditiously communicate validated remedy implementation monitoring data, (4) to make adjustments during remedy implementation in order to further reduce and manage impacts from remedy implementation to affected Community Areas, (5) to expeditiously restore community resources damaged during remediation such as roads and culverts, if any, and (6) to mitigate the economic effects that the Remedial Action will have on the community by structuring remediation contracts to allow more local business participation, if appropriate. The CIMP should contain information about impacts to Community Areas that is sufficient to assist EPA’s Project Coordinator in performing the evaluations recommended under the *Superfund Community Involvement Handbook*, OLEM 9230.0-51 (March 2020), pp. 53-56.
- (g) **Construction Quality Assurance Plan (“CQAP”) and Construction Quality Control Plan (“CQCP”).** The purpose of the CQAP is to describe planned and systemic activities that provide confidence that the Remedial Action construction will satisfy all plans, specifications, and related requirements, including quality objectives. The purpose of the CQCP is to describe the activities to verify that

Remedial Action construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQAP/CQCP (“CQA/CP”) must:

- (1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/CP;
 - (2) Describe the Performance Standards required to be met to achieve Completion of the Remedial Action;
 - (3) Describe the activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;
 - (4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/CP;
 - (5) Describe industry standards and technical specifications used in implementing the CQA/CP;
 - (6) Describe procedures for tracking construction deficiencies from identification through corrective action;
 - (7) Describe procedures for documenting all CQA/CP activities; and
 - (8) Describe procedures for retention of documents and for final storage of documents.
- (h) **O&M Plan.** The O&M Plan describes the requirements for inspecting, operating, and maintaining the Remedial Action. Wallace and PRIDCO shall develop the O&M Plan in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017). The O&M Plan must include the following additional requirements:
- (1) Description of Performance Standards required to be met to implement the Record of Decision;
 - (2) Description of activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;
 - (3) **O&M Reporting.** Description of records and reports that will be generated during O&M, such as daily operating logs, laboratory records, records of operating costs, reports regarding emergencies, personnel and maintenance records, monitoring reports, and monthly and annual reports to EPA and Commonwealth agencies;

- (4) Description of corrective action in case of systems failure, including:
 - (i) alternative procedures to prevent the release or threatened release of Waste Material which may endanger public health and the environment or may cause a failure to achieve Performance Standards; (ii) analysis of vulnerability and additional resource requirements should a failure occur; (iii) notification and reporting requirements should O&M systems fail or be in danger of imminent failure; and (iv) community notification requirements; and
 - (5) Description of corrective action to be implemented in the event that Performance Standards are not achieved; and a schedule for implementing these corrective actions.
- (i) **O&M Manual.** The O&M Manual serves as a guide to the purpose and function of the equipment and systems that make up the remedy. Wallace and PRIDCO shall develop the O&M Manual in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017).

8. SCHEDULES

- 8.1 Applicability and Revisions.** All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Remedial Design and Remedial Action Schedules set forth below. Wallace and PRIDCO may submit proposed revised Remedial Design Schedules or Remedial Action Schedules for EPA approval. Upon EPA's approval, the revised Remedial Design and/or Remedial Action Schedules supersede the Remedial Design and Remedial Action Schedules set forth below, and any previously approved Remedial Design and/or Remedial Action Schedules.

8.2 Remedial Design Schedule

	Description of Deliverable, Task	¶ Ref.	Deadline
1	RDWP	4.1	120 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3)
2	ICIAP	4.2	120 days after receipt of validated analytical data from the Pilot Study and Supplemental PDI
3	Supplemental PDI and Revised Pilot Study Work Plan	4.1 4.4(b)	90 days after EPA's approval of the RDWP
4	SPDI Evaluation Report and Pilot Study Evaluation Report	4.4(b) 4.5(c)	90 days after receipt of validated analytical data from the Pilot Study and Supplemental PDI
5	Preliminary (30%) Remedial Design	4.6	90 days after approval of Supplemental PDI and the Revised Pilot Study report
6	Intermediate (60%) Remedial Design	4.7	60 days after receipt of EPA comments on Preliminary Remedial Design
7	Pre-final (95%) Remedial Design	4.8	60 days after receipt of EPA comments on Intermediate Remedial Design
8	Final (100%) Remedial Design	4.9	30 days after receipt of EPA comments on Pre-final Remedial Design

8.3 Remedial Action Schedule

	Description of Deliverable / Task	¶ Ref.	Deadline
1	Commence to Implement ICIAP	4.2	60 days after EPA Notice of Authorization to Proceed with ICIAP
2	Award Remedial Action contract		120 days after EPA Notice of Authorization to Proceed with Remedial Action
3	RAWP	5.1	240 days after EPA Notice of Authorization to Proceed with Remedial Action
4	Designate IQAT	5.2	240 days after EPA Notice of Authorization to Proceed with Remedial Action
5	Pre-Construction Conference	5.3(a)	30 days after Approval of RAWP
6	Start of Construction		90 days after Approval of RAWP
7	Completion of Construction		As defined in the RAWP
8	Remedial Action Completion Inspection	5.7(a)	30 days after Performance Standards have been fully achieved
9	Remedial Action Report	5.7(b)	30 days after the Remedial Action Completion Inspection
10	Periodic Review Support Plan	5.8	Five years after Start of Remedial Action Construction
11	Work Completion Report	5.9(b)	90 days after completion of all O&M work.

9. COMMONWEALTH PARTICIPATION

- 9.1 Copies.** Wallace and PRIDCO shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the Commonwealth. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to Wallace and PRIDCO, send a copy of such document to the Commonwealth.
- 9.2 Review and Comment.** The Commonwealth will have a reasonable opportunity for review and comment prior to:
- (a) Any EPA notice to proceed under ¶ 3.3 (Procedures for Disapproval/Notice to Proceed);
 - (b) Any EPA approval or disapproval under ¶ 7.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and
 - (c) Any disapproval of, or Certification of Remedial Action Completion under ¶ 5.7 (Certification of Remedial Action Completion), and any disapproval of, or Certification of Work Completion under ¶ 5.9 (Certification of Work Completion).

10. REFERENCES

10.1 The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the three EPA web pages listed in ¶ 10.2:

- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).
- (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
- (c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).
- (d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
- (e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G90/001 (Apr.1990).
- (f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
- (g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
- (h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
- (i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).
- (j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. part 300 (Oct. 1994).
- (k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).
- (l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).
- (m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (n) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, EPA/540-R-01-007 (June 2001).

- (o) Guidance for Quality Assurance Project Plans, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002) <https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5>.
- (p) Institutional Controls: Third-Party Beneficiary Rights in Proprietary Controls, OECA (Apr. 2004).
- (q) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).
- (r) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).
- (s) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2005), <https://www.epa.gov/geospatial/epa-national-geospatial-data-policy>.
- (t) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).
- (u) Principles for Greener Cleanups (Aug. 2009), <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- (v) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).
- (w) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).
- (x) Recommended Evaluation of Institutional Controls: Supplement to the “Comprehensive Five-Year Review Guidance,” OSWER 9355.7-18 (Sep. 2011).
- (y) Plan EJ 2014: Legal Tools, EPA Office of General Counsel (Dec. 2011), <https://www.epa.gov/environmentaljustice/plan-ej-2014-legal-tools>.
- (z) Construction Specifications Institute’s MasterFormat (2020 edition), available from the Construction Specifications Institute, <http://www.csinet.org/masterformat>.
- (aa) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012)
- (bb) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), <https://semspub.epa.gov/work/HQ/175446.pdf>.
- (cc) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012), <https://semspub.epa.gov/work/HQ/175449.pdf>.

- (dd) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), <https://www.epaosc.org/HealthSafetyManual/manual-index.htm>.
- (ee) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).
- (ff) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).
- (gg) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).
- (hh) Quality Management Systems for Environmental Information and Technology Programs -- Requirements with Guidance for Use, ASQ/ANSI E-4 (February 2014), available at <https://webstore.ansi.org/>.
- (ii) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), <https://www.epa.gov/superfund/superfund-post-construction-completion>.
- (jj) Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship (July 20, 2018), <https://www.epa.gov/enforcement/use-advanced-monitoring-technologies-and-approaches-support-long-term-stewardship>.
- (kk) Superfund Community Involvement Handbook, OLEM 9230.0-51 (March 2020). More information on Superfund community involvement is available on the Agency's Superfund Community Involvement Tools and Resources web page at <https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources>.
- (ll) EPA directive CIO 2105.1 (Environmental Information Quality Policy, 2021), https://www.epa.gov/sites/production/files/2021-04/documents/environmental_information_quality_policy.pdf.
- (mm) Electronic Data Deliverable (EDD) Comprehensive Specification Manual 6 (May 2019), https://www.epa.gov/sites/default/files/2019-05/documents/r2comprehensivemanual_may2019.pdf.

10.2 A more complete list may be found on the following EPA web pages:

- (a) Laws, Policy, and Guidance at <https://www.epa.gov/superfund/superfund-policy-guidance-and-laws>;
- (b) Search Superfund Documents at <https://www.epa.gov/superfund/search-superfund-documents>; and

(c) Test Methods Collections at: <https://www.epa.gov/measurements/collection-methods>

10.3 For any regulation or guidance referenced in the Decree or SOW, 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 Wallace and PRIDCO receive notification from EPA of the modification, amendment, or replacement.