UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

IN THE MATTER OF:	
Foster Wheeler Energy Corporation/ Church Road TCE Site Mountain Top, Pennsylvania	CERCLA Docket No. CERC-03-2019-0051DC
Foster Wheeler Energy Corporation	
Respondent	
Proceeding Under Sections 104, 107, and 122 of the Comprehensive, Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9604, 9607 and 9622	**ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR INTERIM REMEDIAL DESIGN**

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement") is entered into voluntarily by the United States Environmental Protection Agency (EPA) and Foster Wheeler Energy Corporation ("FWEC" or "Respondent"). This Settlement provides for the performance of an Interim Remedial Design ("Interim RD") by Respondent and the payment of certain Future Response Costs incurred by the United States at or in connection with the Foster Wheeler Energy Corporation/Church Road TCE Superfund Alternative Site (the "Site") generally located at and near 348 Crestwood Drive in the Crestwood Industrial Park, Mountain Top, Luzerne County, Pennsylvania.

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

3. The objectives of EPA and Respondents (the "Parties") in entering into this Settlement are to protect public health or welfare or the environment at the Site by the design of interim remedial action at the Site by Respondent, for Respondent to pay certain Future Response Costs to EPA, and to resolve the claims of EPA against Respondent as provided in this Settlement. The Parties also intend, by entering into this Settlement, to later enter into a proposed Consent Decree for Interim Remedial Design/Remedial Action. If the Parties later enter into such a Consent Decree, this Settlement shall terminate upon that Consent Decree's entry by the U.S. District Court for the Middle District of Pennsylvania, according to the terms of Section XXV (Effective Date and Termination).

4. In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("NCP") and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the Commonwealth of Pennsylvania, Department of Environmental Protection (the "State") on March 6, 2018, of negotiations with the Respondent, a potentially responsible party, regarding the implementation of an interim remedial design and remedial action for the Site, and EPA has provided the State with an opportunity to participate in such negotiations.

5. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the Department of the Interior on March 1, 2018, of negotiations with Respondent 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 Settlement.

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

II. PARTIES BOUND

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

8. Respondent certifies that it is fully authorized to enter into the terms and conditions of this Settlement and to execute and legally bind Respondent to this Settlement.

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

III. DEFINITIONS

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

a. "Affected Area" shall mean the area located south and southwest of the Former FWEC Facility, encompassing approximately 295 acres, extending from east to west along Church Road and Watering Run, as depicted generally on the map attached as Appendix C.

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

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

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

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

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

g. "Former FWEC Facility," shall mean the area located in the northeastern portion of the Site, encompassing approximately 105 acres, at and near 348 Crestwood Road, in the Crestwood Industrial Park, Mountain Top, Luzerne County, Pennsylvania, as depicted generally on the map attached as Appendix C.

h. "Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing deliverables submitted pursuant to this Settlement, in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Settlement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Section VIII (Property Requirements) (including, but not limited to, cost of attorney time and any monies paid to secure or enforce access or land, water, or other resource use restrictions, including, but not limited to, the amount of just compensation), ¶ 59 (Work Takeover), ¶ 16 (Emergencies and Releases), ¶ 17 (Community Involvement Plan (including the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e))], and the costs incurred by the United States in enforcing the terms of this Settlement, including all costs incurred in connection with Dispute Resolution pursuant to Section XIII (Dispute Resolution) and all litigation costs.

i. "FWEC/Church Road TCE Special Account" shall mean the special account, within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3), and established pursuant the 2009 Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, Docket No. CERC-03-2009-0061DC.

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

k. "Interim Remedial Action" or "Interim RA" shall mean the remedial action selected in the IROD.

l. "Interim Remedial Design" or "Interim RD" shall mean those activities to be undertaken by Respondent to develop final plans and specifications for the Interim Remedial Action as stated in the SOW.

m. "IROD" shall mean the (1) EPA Interim Record of Decision relating to the Site signed on September 25, 2018, by the Director of the Hazardous Site Cleanup Division, EPA Region III, and all attachments thereto, and (2) any Explanations of Significant Differences EPA subsequently issues in connection therewith. The IROD is attached as Appendix A.

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

o. "Non-Settling Owner" shall mean, for purposes of this Settlement only, Westinghouse Air Brake Technologies Corporation, which owns or controls the Former FWEC Facility.

p. "PADEP" shall mean the Pennsylvania Department of Environmental Protection and any successor departments or agencies of the State.

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

r. "Parties" shall mean EPA and Respondent.

s. "Performance Standards" or "PS" shall mean the cleanup levels and other measures of achievement of the remedial action objectives, as set forth in the IROD.

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

u. "Respondent" shall mean Foster Wheeler Energy Corporation or FWEC.

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

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

x. "Site" shall mean the Foster Wheeler Energy Corporation /Church Road TCE Superfund Alternative Site, which collectively includes the Former FWEC Facility, the Affected Area, and the Surrounding Industrial Properties, as depicted generally on the map attached as Appendix C.

y. "State" shall mean the Commonwealth of Pennsylvania.

z. "Statement of Work" or "SOW" shall mean the document describing the activities Respondent must perform to implement the Interim RD, which is attached as Appendix B.

aa. "Supervising Contractor" shall mean the principal contractor retained by Respondent to supervise and direct the implementation of the Work under this Settlement.

bb. "Surrounding Industrial Properties," shall mean the eight separate properties located immediately south and west of the Former FWEC Facility, as depicted generally on the map attached as Appendix C.

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

dd. "United States" shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA and any federal natural resource trustee.

ee. "Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (4) any "hazardous material" under Section 261a.3, Title 25 of the Pennsylvania Code, 25 Pa. Code § 261a.3.

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

IV. FINDINGS OF FACT

11. Based on available information and investigation, EPA has found:

a. FWEC is incorporated in the State of Delaware.

b. FWEC is the former owner of approximately 105 acres of property located in the Crestwood Industrial Park complex, in Mountain Top, Wright Township, Luzerne County, Pennsylvania ("Former FWEC Facility").

c. FWEC's parent company, Foster Wheeler Corporation, owned the Former FWEC Facility from 1953 through 1974. In 1974, Foster Wheeler Corporation assigned all of the assets of the Former FWEC Facility to FWEC. FWEC operated the Former FWEC Facility as a pressure vessel manufacturing plant from 1974 through 1984, at which time the Former FWEC Facility was closed and offered for sale.

d. FWEC used trichloroethene ("TCE") in a sealed vapor degreaser, located outside and adjacent to its main plant building. The degreaser was reportedly removed during the closure of the Former FWEC Facility between 1984 and 1985.

e. Soil samples collected in November and December 1985 near the former sealed vapor degreaser at the Former FWEC Facility indicated the presence of TCE at concentrations ranging from 0.08 milligrams per kilogram ("mg/kg") to 13.1 mg/kg.

f. Groundwater samples collected in April 1986 from monitoring wells near the former vapor degreaser indicated the presence of TCE at concentrations ranging from 101 micrograms per liter ("µg/L") to 151,000 µg/L. Samples collected from the same wells in May 1986 indicated the presence of TCE at concentrations ranging from 15 µg/L to 42,000 µg/L.

g. On February 29, 1988, EPA, the Pennsylvania Department of Environmental Resources ("PADER") and FWEC entered into a Consent Agreement and Order, Docket No.III-88-08-DC ("1988 Order"). The 1988 Order, among other things, required the installation of a pump and treat system to remove and contain TCE groundwater contamination at the Former FWEC Facility.

h. The treatment system began operation in October 1993. Groundwater samples were collected from extraction and monitoring wells on a monthly basis throughout 1994, on a quarterly basis from 1995 through 1997, and on an annual basis from 1998 through the present.

i. On September 14, 2004, FWEC sampled 16 residential wells on Church Road, located approximately 3,000 feet or more from the southwest boundary of the Former FWEC Facility, in an area not suspected to be impacted by TCE.

j. On October 13, 2004, FWEC notified EPA and the Pennsylvania Department of Environmental Protection ("PADEP") that the sample results indicated the presence of TCE at concentrations exceeding the Safe Drinking Water Maximum Contaminant Level ("MCL") of 5 µg/L in 14 of the 16 residential wells described in Paragraph 9.i, above. Concentrations exceeding the MCL ranged from 7.6 µg/L to 160 µg/L.

k. On October 14 and 15, 2004, EPA, PADEP, and FWEC notified the impacted homeowners and Wright Township officials of the detection of TCE. Additionally, EPA collected samples from some of the 16 initial sample locations to confirm the results and sampled additional residential wells in the area. FWEC provided bottled water to all residents who requested it and to residents whose wells were potentially impacted by TCE.

l. From approximately November 2004 through April 2005, FWEC, under EPA's supervision, installed carbon filtration units in approximately thirty-eight impacted or potentially impacted residential wells to eliminate exposure to groundwater impacted or potentially impacted by Site-related TCE.

m. On August 29, 2005, EPA and FWEC entered into an Administrative Settlement Agreement and Order By Consent For Removal Response Action ("2005 Order"), Docket No. CERC-03-2005-0349DC. The 2005 Order addressed exposure concerns to residents in the Affected Area, from use of groundwater impacted by TCE. Pursuant to the 2005 Order, FWEC connected residents in the Affected Area to a public water supply, eliminating the use of groundwater impacted by TCE as an exposure pathway for TCE.

n. For administrative purposes only, EPA has identified the Foster Wheeler Energy Corporation /Church Road TCE Site as encompassing the Former FWEC Facility, as defined in the 1988 Order; any off-property areas in which hazardous substances from the Former FWEC Facility may have come to be located; and the Church Road TCE Site, including the Affected Area. The Site does not include lawful off-property disposal via vehicle transport.

o. On April 9, 2009, in response to a release or a substantial threat of a release of a hazardous substance(s) at or from the Site, EPA and Respondent entered into an Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study ("RI/FS AOC"), Docket No. 03-CERC-2009-0061DC. Under the RI/FS AOC, Respondent agreed to investigate and evaluate cleanup options for the Site following the Superfund Alternative Approach.

p. On April 9, 2009, Respondent commenced a Remedial Investigation ("RI") and Feasibility Study ("FS") for the Site pursuant to 40 C.F.R. § 300.430.

q. Respondent completed the RI and FS, with EPA approving the Final RI Report on June 21, 2017, and the Final FS Report on April 12, 2018.

r. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS and of the proposed plan for Interim Remedial Action for the Site on May 9, 2018, 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 Interim Remedial Action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Director of the Hazardous Site Cleanup Division, EPA Region III, based the selection of the response action.

s. The decision by EPA on the Interim Remedial Action to be implemented at the Site is embodied in an Interim Record of Decision ("IROD"), executed on September 25, 2018, on which the State gave its concurrence. The IROD includes a responsiveness summary to the public comments. Notice of the IROD was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b).

t. The Interim RA selected in the IROD addresses contaminated sediment, soil, and groundwater at the Former FWEC Facility and Site-wide vapor intrusion. It does not address groundwater in the Surrounding Industrial Properties, as defined in Section III (Definitions) and the Affected Area. A final remedial action for the entire Site will be selected in a future decision document, after applicable public participation requirements are met.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

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

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

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

c. Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

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

e. The conditions described in ¶¶ 11.e, 11.f, 11.j, and 11.k of the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C.§ 9601(22).

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

VI. SETTLEMENT AGREEMENT AND ORDER

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

VII. PERFORMANCE OF THE WORK

14. Coordination and Supervision

a. **Project Coordinators.**

(1) Respondent's Project Coordinator must have sufficient technical expertise to coordinate the Work. Respondent's Project Coordinator may not be an attorney representing any Respondent in this matter and may not act as the Supervising Contractor. Respondent's Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.

(2) EPA Designation of Project Coordinators:

Project Coordinator	Alternate Project Coordinator
Will Geiger (3SD21) U.S. Environmental Protection Agency 1650 Arch Street Philadelphia, PA 19103 (215) 814-3413 geiger.will@epa.gov	Director, Superfund and Emergency Management Division (3SD00) U.S. Environmental Protection Agency, Region III 1650 Arch Street Philadelphia, PA 19103

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 NCP. This includes the authority to halt the Work and/or to conduct or direct any necessary response action when he or she determines 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. EPA may change its Project Coordinator and/or Alternate Project Coordinator by providing notice to Respondent.

(3) Respondent's Project Coordinator shall meet in person or by phone with EPA's Project Coordinator at least monthly, unless the parties agree otherwise in writing.

b. **Supervising Contractor.** Respondent's proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with ASQ/ANSI E4:2014, "Quality Management Systems for Environmental Information and Technology Programs - Requirements with Guidance for Use" (American Society for Quality, February 2014).

c. **Procedures for Disapproval/Notice to Proceed**

(1) Respondent shall designate, and notify EPA, within 20 days after the Effective Date, of the name[s], title[s], contact information, and qualifications of Respondent's proposed Project Coordinator and Supervising Contractor, whose qualifications shall be subject to EPA's review for verification based on objective assessment criteria (*e.g.,* experience, capacity, technical expertise) and to confirm that it does not have a conflict of interest with respect to the Work.

(2) EPA shall issue notices of disapproval and/or authorizations to proceed regarding the proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval at any time, Respondent shall, within 20 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. EPA shall issue a notice of disapproval or authorization to proceed regarding each supplemental proposed coordinator and/or contractor. Respondent may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of Respondent's selection.

(3) Respondent may change its Project Coordinator and/or Supervising Contractor, as applicable, by following the procedures of ¶¶ 14.c(1) and 14.c(2).

(4) Notwithstanding the procedures of ¶ 14.c(1) through 14.c(3), Respondent has proposed, and EPA has authorized Respondent to proceed, regarding the following Project Coordinator and Supervising Contractor: William L. Goldschmidt, Principal Scientist - Environmental, Wood Environment & Infrastructure Solutions, 751 Arbor Way, Hillcrest 1, Suite 180, Blue Bell, PA 19422-1060, bill.goldschmidt@woodplc.com, (610) 877-6137.

15. **Performance of Work in Accordance with SOW.** Respondent shall develop the Interim RD in accordance with the SOW and all EPA-approved, conditionally-approved, or modified deliverables as required by the SOW. All deliverables required to be submitted for approval under the Settlement or SOW shall be subject to approval by EPA in accordance with ¶ 5.5 (Approval of Deliverables) of the SOW.

16. **Emergencies and Releases**. Respondent shall comply with the emergency and release response and reporting requirements under ¶ 3.8 (Emergency Response and Reporting) of the SOW. Subject to Section XVI (Covenants by EPA), nothing in this Settlement, including ¶ 3.8 of the SOW, limits any authority of EPA: (a) to take 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 (b) to direct or order such 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. If, due to Respondent's failure to take appropriate response action under ¶ 3.8 of the SOW, EPA takes such action instead, Respondent shall reimburse EPA under Section XII (Payment of Future Response Costs) for all costs of the response action.

17. **Community Involvement**. If requested by EPA, Respondent shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with, Section 2 (Community Involvement) of the SOW. Such activities may include, but are not limited to, designation of a Community Involvement Coordinator Costs incurred by EPA under this Section constitute Future Response Costs to be reimbursed under Section XII (Payments for Response Costs).

18. **Modification of SOW or Related Deliverables**

a. If EPA determines that it is necessary to modify the work specified in the SOW and/or in deliverables developed under the SOW in order to carry out the Interim RD, then EPA may notify Respondent of such modification. If Respondent objects to the modification it may, within 30 days after EPA's notification, seek dispute resolution under Section XIII (Dispute Resolution).

b. The SOW and/or related work plans shall be modified: (1) in accordance with the modification issued by EPA; or (2) if Respondent invokes dispute resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this Settlement, and Respondent shall implement all work required by

such modification. Respondent shall incorporate the modification into the deliverable required under the SOW, as appropriate.

c. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this Settlement.

VIII. SITE ACCESS

19. Respondent has entered into an access agreement with the Non-Settling Owner of the Former FWEC Facility, which includes providing access for all work required pursuant to the RI/FS AOC, and has provided the United States with a copy of such access agreement. The access agreement provides the EPA, the State, Respondent, and their representatives, contractors, and subcontractors with access to the Former FWEC Facility at all reasonable times to conduct any activity regarding this Settlement.

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

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

IX. ACCESS TO INFORMATION

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

23. **Privileged and Protected Claims**

a. Respondent may assert all or part of a Record requested by EPA or the State is privileged or protected as provided under federal law, in lieu of providing the Record, provided Respondent complies with ¶ 23.b, and except as provided in ¶ 23.c.

b. If Respondent asserts such a privilege or protection, it shall provide EPA and the State with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each

recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Respondent shall provide the Record to EPA and the State in redacted form to mask the privileged or protected portion only. Respondent shall retain all Records that it claims to be privileged or protected until EPA and the State have had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in Respondent's favor.

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

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

25. Notwithstanding any provision of this Settlement, EPA and the State retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. RECORD RETENTION

26. Until 10 years after EPA provides notice pursuant to ¶ 3.10 of the SOW (Notice of Work Completion), that all work has been fully performed in accordance with this Settlement, Respondent shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that Respondent who is potentially liable as owners or operators of the Site must retain, in addition, all Records that relate to the liability of any other person under CERCLA with respect to the Site. Respondent must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above, all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in their possession or control or that come into their possession or control that relate in any manner to the performance of the Work, provided, however, that Respondent (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

27. At the conclusion of the document retention period, Respondent shall notify EPA and the State at least 90 days prior to the destruction of any such Records and, upon request by EPA or the State, and except as provided for in ¶ 23 (Privileged and Protected Claims), Respondent shall deliver any such Records to EPA or the State.

28. Respondent certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by EPA or the State and that it has fully complied with any and all EPA and State requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law.

XI. COMPLIANCE WITH OTHER LAWS

29. Nothing in this Settlement limits Respondent's obligation to comply with the requirements of all applicable federal and state laws and regulations. Respondent must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this Settlement, if approved by EPA, shall be considered consistent with the NCP.

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

31. Respondent may seek relief under the provisions of Section XIV (Force Majeure) for any delay in performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 30 (Permits) and required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals. This Settlement is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XII. PAYMENT OF FUTURE RESPONSE COSTS

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

a. **Periodic Bills**. On a periodic basis, EPA will send Respondent a bill requiring payment that includes a cost summary which includes direct and indirect costs incurred by EPA, its contractors, subcontractors, and the United States Department of Justice. Respondent shall make all payments within 30 days after Respondent's receipt of each bill requiring payment, except as otherwise provided in ¶ 34 (Contesting Future Response Costs). Respondent shall make payment to EPA by Fedwire Electronic Funds Transfer (EFT) to:

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

and shall reference Site/Spill ID Number 03R6 and the EPA docket number for this action.

b. At the time of payment, Respondent shall send notice that payment has been made to EPA's Project Coordinator and to the EPA Cincinnati Finance Office by email at cinwd_acctsreceivable@epa.gov, or by mail to

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

Such notice shall reference Site/Spill ID Number 03R6 and the EPA docket number for this action.

c. **Deposit of Future Response Costs Payments**. The total amount to be paid by Respondent pursuant to ¶ 32.a (Periodic Bills) shall be deposited by EPA in the FWEC /Church Road TCE Site 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 EPA Hazardous Substance Superfund, provided, however, that EPA may deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund if, at the time the payment is received, EPA estimates that the FWEC/Church Road TCE Site Special Account balance is sufficient to address currently anticipated future response actions to be conducted or financed by EPA at or in connection with the Site. Any decision by EPA to deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund for this reason shall not be subject to challenge by Respondent pursuant to the dispute resolution provisions of this Settlement or in any other forum.

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

34. **Contesting Future Response Costs**. Respondent may initiate the procedures of Section XIII (Dispute Resolution) regarding payment of any Future Response Costs billed under ¶ 32 (Payments for Future Response Costs) if it determines that EPA has made a mathematical

error or included a cost item that is not within the definition of Future Response Costs, or if it believes EPA incurred excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. To initiate such dispute, Respondent shall submit a Notice of Dispute in writing to the EPA Project Coordinator within 30 days after receipt of the bill. Any such Notice of Dispute shall specifically identify the contested Future Response Costs and the basis for objection. If Respondent submits a Notice of Dispute, Respondent shall within the 30-day period, also as a requirement for initiating the dispute, (a) pay all uncontested Future Response Costs to EPA in the manner described in ¶ 32, and (b) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation (FDIC) and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondent shall send to the EPA Project Coordinator a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. If EPA prevails in the dispute, within 5 days after the resolution of the dispute, Respondent shall pay the sums due (with accrued interest) to EPA in the manner described in ¶ 32. If Respondent prevails concerning any aspect of the contested costs, Respondent shall pay that portion of the costs (plus associated accrued interest) for which it did not prevail to EPA in the manner described in ¶ 32. Respondent shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIII (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondent's obligation to reimburse EPA for its Future Response Costs.

XIII. DISPUTE RESOLUTION

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

36. **Informal Dispute Resolution**. If Respondent objects to any EPA action taken pursuant to this Settlement, including billings for Future Response Costs, it shall send EPA a written Notice of Dispute describing the objection(s) within 7 days after such action, unless the objection(s) has/have been resolved informally. EPA and Respondent shall have 20 days from EPA's receipt of Respondent's Notice of Dispute to resolve the dispute through informal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Settlement.

37. **Formal Dispute Resolution**. If the Parties are unable to reach an agreement within the Negotiation Period, Respondent shall, within 10 days after the end of the Negotiation Period, submit a statement of position to EPA. EPA may, within 20 days thereafter, submit a statement of position. Thereafter, the Associate Director of the Office of Superfund Site Remediation within the Region III Hazardous Site Cleanup Division or his/her delegate will issue a written decision on the dispute to Respondent. EPA's decision shall be incorporated into

and become an enforceable part of this Settlement. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

38. The invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of Respondent under this Settlement, except as provided by ¶ 34 (Contesting Future Response Costs), as agreed by EPA.

39. Except as provided in ¶ 49, stipulated penalties with respect to the disputed matter shall continue to accrue, but payment shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Settlement. In the event that Respondent does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XV (Stipulated Penalties).

XIV. FORCE MAJEURE

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

41. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement for which Respondent intends or may intend to assert a claim of force majeure, Respondent shall notify the EPA as follows:

a. Oral Notification: Within 48 hours of the time Respondent knew or should have known that the event might cause a delay, Respondent shall notify the EPA Project Coordinator or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the Hazardous Site Cleanup Division.

b. Written Notification: Within 5 days of the time Respondent knew or should have known that the event might cause a delay, Respondent shall notify the EPA Project Coordinator or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the Hazardous Site Cleanup Division.

Within 5 days thereafter, Respondent shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health or welfare, or the environment. Respondent shall include with any notice all available documentation supporting its claim that the delay was attributable to a force majeure. Respondent shall be deemed to know of any circumstance of which Respondent, any entity controlled by Respondent, or Respondent's contractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude Respondent from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 40 and whether Respondent has exercised its best efforts under ¶ 40, EPA may, in its unreviewable discretion, excuse in writing Respondent's failure to submit timely or complete notices under this Paragraph.

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

43. If Respondent elects to invoke the dispute resolution procedures set forth in Section XIII (Dispute Resolution), it shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, Respondent shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondent complied with the requirements of ¶¶ 40 and 41. If Respondent carries this burden, the delay at issue shall be deemed not to be a violation by Respondent of the affected obligation of this Settlement identified to EPA.

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

XV. STIPULATED PENALTIES

45. Respondent shall be liable to EPA for stipulated penalties in the amounts set forth in ¶¶ 46.a and 47 for failure to comply with the obligations specified in ¶¶ 46.a and 47, unless excused under Section XIV (Force Majeure). "Comply" as used in the previous sentence

includes compliance by Respondent with all applicable requirements of this Settlement, within the deadlines established under this Settlement. If (i) an initially submitted or resubmitted deliverable contains a material defect and the conditions are met for modifying the deliverable under ¶ 5.5(a) of the SOW; or (ii) a resubmitted deliverable contains a material defect; then the material defect constitutes a lack of compliance for purposes of this Paragraph.

46. Stipulated Penalty Amounts: Major Violations:

a. The following stipulated penalties shall accrue per violation per day for any noncompliance with any obligation identified in ¶ 46.b:

Penalty Per Violation Per Day	Period of Noncompliance
$5,000	1st through 14th day
$10,000	15th through 30th day
$15,000	31st day and beyond

b. **Obligations**

(1) Payment of any amount due under Section XII (Payment of Future Response Costs).

(2) Establishment of an escrow account to hold any disputed Future Response Costs under ¶ 34 (Contesting Future Response Costs).

(3) Timely designation of a Project Coordinator and Supervisory Contractor, including replacements thereof, under Paragraph 14;

(4) Emergency and release response and reporting requirements under Paragraph 16;

(5) Community involvement activities required under Paragraph 17;

(6) Requirements regarding access and non-interference under Paragraph 19;

(7) Providing requested information and documents under Paragraph 22;

(8) Record retention and notice requirements under Section X;

(9) Insurance requirements under Section XXII;

(10) Timely submission of the following deliverables in accordance with the schedules and requirements in the SOW, including resubmission following disapproval by EPA:

i. Interim RD Work plan;

ii. Pre-Design Investigation Work Plan;

iii. Pre-Design Investigation Evaluation Report;

iv. Treatability Study Work Plan;

v. Treatability Study Evaluation Report;

vi. Preliminary (30%) Interim Remedial Design;

vii. Pre-Final (95%) Interim Remedial Design;

viii. Final (100%) Interim Remedial Design;

ix. Plans for testing and implementing a Contingency Remedy;

x. Progress reports; and

xi. Supporting Deliverables;

(11) Timely implementation of actions in accordance with schedules set forth in EPA-approved deliverables described in subparagraph 12, above.

47. **Stipulated Penalty Amounts: Other Deliverables.** The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate deliverables required by this Settlement, other than those specified in ¶ 46.b:

Penalty Per Violation Per Day	Period of Noncompliance
$2,000	1st through 14th day
$3,000	15th through 30th day
$5,000	31st day and beyond

48. In the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 59 (Work Takeover), Respondent shall be liable for a stipulated penalty in the amount of $500,000. Stipulated penalties under this Paragraph are in addition to the remedies available to EPA under ¶ 59 (Work Takeover).

49. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Penalties shall continue to accrue during any dispute resolution period, and shall be paid within 15 days after the agreement or the receipt of EPA's decision. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under ¶ 5.5 (Approval of Deliverables) of the SOW, during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondent of any deficiency; and (b) with respect to a decision by the Associate Director of the Office of Superfund Site Remediation within the Region III Hazardous Site Cleanup Division or his/her delegate under Section XIII (Dispute Resolution), during the period,

if any, beginning on the 21st day after the Negotiation Period begins until the date that such official issues a final decision regarding such dispute. Nothing in this Settlement shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement.

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

51. All penalties accruing under this Section shall be due and payable to EPA within 30 days after Respondent's receipt from EPA of a demand for payment of the penalties, unless Respondent invokes the Dispute Resolution procedures under Section XIII (Dispute Resolution) within the 30-day period. All payments to EPA under this Section shall indicate that the payment is for stipulated penalties and shall be made in accordance with ¶ 32 (Payments for Future Response Costs).

52. If Respondent fails to pay stipulated penalties when due, Respondent shall pay Interest on the unpaid stipulated penalties as follows: (a) if Respondent has timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to ¶ 49 until the date of payment; and (b) if Respondent fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under ¶ 51 until the date of payment. If Respondent fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

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

54. Nothing in this Settlement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), provided, however, that EPA shall not seek civil penalties pursuant to Section 122(*l*) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided in this Settlement, except in the case of a willful violation of this Settlement or in the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 59 (Work Takeover).

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

XVI. COVENANTS BY EPA

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

XVII. RESERVATIONS OF RIGHTS BY EPA

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

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

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

b. liability for costs not included within the definition of Future Response Costs;

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

d. criminal liability;

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

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

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

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

59. **Work Takeover**

a. In the event EPA determines that Respondent: (1) has ceased implementation of any portion of the Work; (2) is seriously or repeatedly deficient or late in its performance of the Work; or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to Respondent. Any Work Takeover Notices issued by EPA (which writing may be electronic) will specify the grounds upon which such notice was issued and will provide Respondent a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the 10-day notice period specified in ¶ 59.a Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary ("Work Takeover"). EPA will notify Respondent in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this ¶ 59.b. Costs that the United States incurs in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondent shall pay pursuant to Section XII (Payments for Future Response Costs).

c. Respondent may invoke the procedures set forth in ¶ 37 (Formal Dispute Resolution) to dispute EPA's implementation of a Work Takeover under ¶ 59.b. However, notwithstanding Respondent's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under ¶ 59.b until the earlier of (1) the date that Respondent remedies, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, or (2) the date that a written decision terminating such Work Takeover is rendered in accordance with ¶ 37 (Formal Dispute Resolution).

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

XVIII. COVENANTS BY RESPONDENT

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

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

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

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

61. Except as expressly provided in ¶ 64 (Waiver of Claims by Respondent), these covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to any of the reservations set forth in Section XVII (Reservations of Rights by EPA), other than in ¶ 58.a (liability for failure to meet a requirement of the Settlement), 58.d (criminal liability), or 58.e (violations of federal/state law during or after implementation of the Work), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

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

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

64. **Waiver of Claims by Respondent**

a. Respondent agrees not to assert any claims and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that it may have:

(1) **De Micromis Waiver**. For all matters relating to the Site against any person where the person's liability to Respondent with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if all or part of the disposal, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such

person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials.

b. **Exceptions to Waiver**

(1) The waiver under this ¶ 64 shall not apply with respect to any defense, claim, or cause of action that Respondent may have against any person otherwise covered by such waiver if such person asserts a claim or cause of action relating to the Site against Respondent.

XIX. OTHER CLAIMS

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

66. Except as expressly provided in ¶ 64 (Waiver of Claims by Respondent) and Section XVI (Covenants by EPA), nothing in this Settlement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages, and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

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

XX. EFFECT OF SETTLEMENT/CONTRIBUTION

68. Except as provided in ¶ 64 (Waiver of Claims by Respondent, nothing in this Settlement shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Settlement. Except as provided in Section XVIII (Covenants by Respondent), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action that each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto. Nothing in this Settlement diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2) and (3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

69. The Parties agree that this Settlement constitutes an administrative settlement pursuant to which Respondent has, as of the Effective Date, resolved liability to the United States within the meaning of Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), and is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, or

as may be otherwise provided by law, for the "matters addressed" in this Settlement. The "matters addressed" in this Settlement are the Work and Future Response Costs.

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

71. Respondent shall, with respect to any suit or claim brought by it for matters related to this Settlement, notify EPA in writing no later than 60 days prior to the initiation of such suit or claim. Respondent also shall, with respect to any suit or claim brought against it for matters related to this Settlement, notify EPA in writing within 10 days after service of the complaint or claim upon it. In addition, Respondent shall notify 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, for matters related to this Settlement.

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

XXI. INDEMNIFICATION

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

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

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

XXII. INSURANCE

76. No later than 15 days before commencing any on-site Work, Respondent shall secure, and shall maintain until the first anniversary after issuance of Notice of Work Completion pursuant to ¶ 3.10 of the SOW, commercial general liability insurance with limits of liability of $1 million per occurrence, and automobile insurance with limits of liability of $1 million per accident, and umbrella liability insurance with limits of liability of $5 million in excess of the required commercial general liability and automobile liability limits, naming EPA as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Respondent pursuant to this Settlement. In addition, for the duration of the Settlement, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement, Respondent shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondent in furtherance of this Settlement. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, Respondent need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Respondent shall ensure that all submittals to EPA under this Paragraph identify the Foster Wheeler Energy Corporation /Church Road TCE Site, Mountain Top, Pennsylvania and the EPA docket number for this action.

XXIII. INTEGRATION/APPENDICES

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

a. Appendix A is the IROD signed by EPA on September 25, 2018.

b. Appendix B is the SOW.

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

XXIV. MODIFICATION

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

79. If Respondent seeks permission to deviate from any approved work plan, schedule, or SOW, Respondent's Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from the EPA Project Coordinator pursuant to ¶ 78.

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

XXV. EFFECTIVE DATE AND TERMINATION

81. The Effective Date of this Settlement shall be the date on which it is signed by EPA.

82. Except as provided herein, this Settlement shall terminate at the time a Consent Decree for the Interim Remedial Design/Remedial Action is entered by the U.S. District Court for the Middle District of Pennsylvania. Such termination shall not affect:

a. The requirement to pay Future Response Costs, stipulated penalties, or civil penalties demanded or assessed under this Settlement and actions brought at any time to collect such costs and penalties;

b. Indemnification made pursuant to this Settlement;

c. Covenants provided pursuant to this Settlement;

d. Contribution protection arising out of this Settlement; or

e. Reservations of rights made under this Settlement.

IT IS SO ORDERED AND AGREED.

May 22, 2019

PAUL LEONARD
Acting Director, Superfund & Emergency Management Division
U.S. Environmental Protection Agency
Region III

Date

FOR FOSTER WHEELER ENERGY CORPORATION:

By _____ 5/14/19

Foster Wheeler Energy Corporation — Date

Please Type the Following:

Name: Byron Roth

Title: President

Address: 53 Frontage Road
P.O Box 9000
Hampton, NJ 08827

APPENDIX A

INTERIM RECORD OF DECISION

FOSTER WHEELER ENERGY CORPORATION/ CHURCH ROAD TCE SUPERFUND SITE MOUNTAIN TOP, LUZERNE COUNTY, PENNSYLVANIA

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

REGION 3
PHILADELPHIA, PENNSYLVANIA
September 2018

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

%	percent
µg/L	micrograms per liter
AOC	administrative order on consent
ARARs	applicable or relevant and appropriate requirements
ASD	active soil depressurization
bgs	below ground surface
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
cm^2	square centimeters
cm/sec	centimeters per second
COCs	contaminants of concern
COPECs	contaminants of potential ecological concern
CSM	conceptual site model
EA	environmental assessment
EC	engineering control
EPA	United States Environmental Protection Agency
ESD	explanation of significant differences
EWA	former expended waste area
FS	Feasibility Study
FPSA	former paint storage area
FSBA	former shot blast area
FVDA	former vaport degreaser area
FWEC	Foster Wheeler Energy Corporation
FWWTP	Former Wastewater Treatment Pond
FYR	five-year review
gals/mg	gallons per milligram
gals/min	gallons per minute
GETS	groundwater extraction and treatment system
Hg	mercury
HHRA	human health risk assessment
HI	hazard index
hr/d	hours per day
IRM	Interim Remedial Measure
IC	institutional control
IROD	Interim Record of Decision
kg/d	kilograms per day
L/gal	liters per gallon
lbs	pounds
lbs/d	pounds per day
lbs/hr	pounds per hour
lbs/kg	pounds per kilogram
MCL	maximum contaminant level
mg	milligrams

ACRONYMS AND ABBREVIATIONS (continued)

mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
min/hr	minutes per hour
MIP	Membrane Interface Probe
MK	Morrison-Knudsen
MSC	medium specific concentration
msl	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PCU	power control units
PRAP	Proposed Interim Remedial Action Plan
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RSL	regional screening level
SAA	Superfund Alternative Approach
scfm	standard cubic feet per minute
SIPS	Surrounding Industrial Properties
Site	Foster Wheeler Energy Corporation/Church Road TCE Superfund Site
SLERA	screening level ecological risk assessment
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
TCE	trichloroethene
tpy	tons per year
UST	underground storage tanks
U.S.C.	United States Code
VI	vapor intrusion
VOC	volatile organic compound

I. DECLARATION

FOSTER WHEELER ENERGY CORPORATION/CHURCH ROAD TCE SUPERFUND SITE INTERIM REMEDIAL ACTION

MOUNTAIN TOP, LUZERNE COUNTY, PENNSYLVANIA

RECORD OF DECISION FOR INTERIM REMEDIAL ACTION
FOSTER WHEELER ENERGY CORPORATION/CHURCH ROAD TCE SUPERFUND SITE

DECLARATION

1.0 SITE NAME AND LOCATION

Foster Wheeler Energy Corporation/Church Road TCE Superfund Site
Mountain Top, Luzerne County, Pennsylvania
EPA ID Number: PAD003031788

2.0 STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Interim Remedial Action for the Foster Wheeler Energy Corporation/Church Road TCE Superfund Site (Site) located in Mountain Top, Luzerne County, Pennsylvania (**Figure 1**). The Selected Interim Remedial Action addresses contaminated sediment, soil, and groundwater at the former Foster Wheeler Energy Corporation (FWEC) Facility and Site-wide vapor intrusion (VI). It does not address groundwater in the Surrounding Industrial Properties (SIPs) and the Affected Area. The final remedial action for the entire Site will be selected in a future decision document.

The Selected Interim Remedial Action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9601 et seq., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300.

This decision is based on the Administrative Record for the Site, which was developed in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k).

The Commonwealth of Pennsylvania concurs with the Selected Interim Remedial Action (**Appendix A**).

3.0 ASSESSMENT OF THE SITE

The Interim Remedial Action selected in this Interim Record of Decision (IROD) is necessary to protect the public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

4.0 DESCRIPTION OF THE SELECTED INTERIM REMEDIAL ACTION

The Site includes the following three areas, as shown on **Figure 2**:

- The former FWEC Facility, located in the northeastern portion of the Site at 348 Crestwood Drive, is approximately 105 acres;

- The Affected Area, primarily a residential area which extends from east to west along Church Road and Watering Run, is approximately 295 acres in size, and is generally located south and southwest of the former FWEC Facility; and

- The Surrounding Industrial Properties (SIPs), located immediately south and west of the former FWEC Facility and consisting of eight separate commercial/industrial properties.

FWEC operated the former FWEC Facility from 1953 until 1984, where it manufactured large pressure vessels utilized in oil refineries, electric utility plants, and the shipping industry. Between the mid-1980s and the present, numerous environmental investigations were performed at the Site, resulting in construction of a groundwater extraction and treatment system and two vapor intrusion (VI) mitigation systems. From 2010-2018, FWEC performed a remedial investigation and feasibility study (RI/FS), which concluded that more data is needed to select a remedial action for groundwater in the SIPs and Affected Area, but that sufficient data existed to select an interim remedial action for the former FWEC Facility and Site-wide VI.

The Selected Interim Remedial Action (Alternative 5) includes the following components:

- Capping and soil vapor extraction (SVE) treatment of Source Area Soils;

- Continued groundwater extraction and treatment using the existing groundwater extraction and treatment system (GETS);

- Optimization of the GETS;

- Sediment removal and restoration at the Former Wastewater Treatment Pond (FWWTP);

- VI monitoring and mitigation;

- Groundwater monitoring; and

- Institutional Controls (ICs)

Implementation of the Selected Interim Remedial Action will reduce the volume, toxicity and mobility of contaminants in Source Area Soils at the former FWEC Facility through capping and soil vapor extraction treatment. This action will also reduce the leaching of contaminants from soil and weathered bedrock into groundwater at the former FWEC Facility.

Continued operation and optimization of the GETS will prevent further migration of contaminated groundwater from the former FWEC Facility, and will continue restoration of the groundwater to beneficial use by reducing the volume of contaminated groundwater within the former FWEC Facility.

Continued operation of the existing vapor mitigation systems will eliminate any unacceptable risk from VI at the Site. Groundwater monitoring will ensure that any additional potential VI risks from contaminated groundwater will be discovered and addressed appropriately.

The removal of contaminated sediment from the FWWTP will eliminate any unacceptable ecological risk from Site-related contaminants.

The ICs selected as part of this IROD will protect the integrity of the Selected Interim Remedial Action, while still allowing the former FWEC Facility to be utilized for industrial purposes.

The Selected Interim Remedial Action will be consistent with any subsequent remedial actions to address the remaining contaminated groundwater at the Site.

The estimated present worth cost of the Selected Interim Remedial Action is $4,150,000.

5.0 STATUTORY DETERMINATIONS

The Selected Interim Remedial Action is protective of human health and the environment in the short term and is intended to provide adequate protection until a Final Remedial Action is selected, complies with (or waives) those Federal and State requirements that are applicable or relevant and appropriate to the Selected Interim Remedial Action (unless justified by a waiver), and is cost-effective. Although the Selected Interim Remedial Action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, the Selected Interim Remedial Action does utilize treatment and thus supports that statutory mandate.

Because the Selected Interim Remedial Action does not constitute the final remedial action for the Site, the statutory preference for remedial actions that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in the Selected Interim Remedial Action, will be addressed by a final decision document. Subsequent actions are planned to address fully the threats posed by conditions at this Site. Because the Selected Interim Remedial Action will result in hazardous substances remaining on-Site above health-based levels, a review will be conducted to ensure that the Selected Interim Remedial Action continues to provide adequate protection of human health and the environment within five years after commencement of the Selected Interim Remedial Action. Because this is an interim action ROD, review of this Site and remedial action will be ongoing as EPA continues to develop remedial alternatives for the Site.

6.0 IROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary of this IROD. Additional information can be found in the Administrative Record for the Site.

IROD CERTIFICATION CHECKLIST	
Information	**Location/Page Number**
Chemicals of concern (COCs) and respective concentrations	Sections 7.0 - 7.3, p. 13-16
Baseline risk represented by the COCs	Sections 7.0 - 7.3, p. 13-16
Clean-up levels established for COCs and the basis for these levels	Section 12.2.7, p. 29-30 and Tables 1 - 4
How source materials constituting principal threat are addressed	Section 11, p. 24
Current and reasonably anticipated future land use assumptions and potential future beneficial uses of groundwater	Section 6, p. 12
Potential future land and groundwater use that will be available at the Site as a result of the Selected Interim Remedial Action	Section 6, p. 12 Section 12.4, p. 30
Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedial action cost estimates are projected	Section 12.3, p. 30 and Table 6, Appendix B
Key factors that led to selecting the Interim Remedial Action	Section 12.1, p. 25

Karen Melvin, Director
Hazardous Site Cleanup Division
EPA Region III

SEP 25 2018
Date

II. DECISION SUMMARY

FOSTER WHEELER ENERGY CORPORATION/CHURCH ROAD TCE SUPERFUND SITE INTERIM REMEDIAL ACTION

MOUNTAIN TOP, LUZERNE COUNTY, PENNSYLVANIA

1.0 SITE NAME, LOCATION AND DESCRIPTION

The Foster Wheeler Energy Corporation/Church Road TCE Superfund Site (Site) (EPA ID: PAD003031788) is located in Mountain Top, Wright Township, Luzerne County, Pennsylvania approximately 5 to 6 miles south of Wilkes-Barre, PA (**Figure 1**).

The Site includes the following three areas, as shown on **Figure 2**:

- The former FWEC Facility, located in the northeastern portion of the Site at 348 Crestwood Drive, is approximately 105 acres;
- The Affected Area, primarily a residential area which extends from east to west along Church Road and Watering Run, is approximately 295 acres in size, and is generally located south and southwest of the former FWEC Facility; and
- The Surrounding Industrial Properties (SIPs), located immediately south and west of the former FWEC Facility and consisting of eight separate commercial/industrial properties.

The U.S. Environmental Protection Agency (EPA) is the lead agency for the Interim Remedial Action at the Site and the Pennsylvania Department of Environmental Protection (PADEP) is the support agency.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 Site History

Former FWEC Facility

FWEC operated the former FWEC Facility from 1953 until 1984, where it manufactured large pressure vessels utilized in oil refineries, electric utility plants, and the shipping industry. FWEC ceased operations at the property in 1984. From 1989 through 1997, Morrison-Knudsen (MK) and its successors manufactured and remanufactured locomotives, small power control units (PCUs), and flat cars for rail transportation of tractor-trailers. Westinghouse Air Brake Technologies (Wabtec) re-initiated operations at the former FWEC Facility, and the property has been used for warehousing of products (primarily fiberglass insulation products) by third parties under a lease agreement. The property is currently used for tractor-trailer parking.

Affected Area

The Affected Area is located south and southwest of the former FWEC Facility and consists of primarily residential development along Church Road, Sunset Gardens, Elbe Road, and South Mountain Boulevard, with limited commercial properties in the westernmost portion. Saint Jude's Church complex, which includes an elementary school, is located adjacent to the intersection of Church Road and Route 309.

Surrounding Industrial Properties

The former FWEC Facility is located within Crestwood Industrial Park. Crestwood Industrial Park is approximately 1,050 acres in size and is utilized by industries and manufacturers for

mixed industrial use. Eight SIPs are located to the south and west of the former FWEC Facility and within approximately 0.25-mile of Watering Run. Some, but not all, of these commercial properties are located between the former FWEC Facility and the Affected Area.

2.2 Regulatory History and Previous Investigations

The following is a summary of environmental investigations and environmental remediation activities at the Site.

On February 11, 1980, an electrical transformer in the main bay of the Main Building at the former FWEC Facility leaked Pyranol, a coolant containing polychlorinated biphenyls (PCBs), onto the concrete floor of the former FWEC Facility. The estimated area affected by the spill was 30 feet by 70 feet and included an area along the interior railroad tracks. FWEC reported the spill to authorities, cleaned the area affected by the spill, and disposed of the waste at a permitted facility.

Prior to a potential sale of the property, a prospective purchaser conducted an environmental assessment (EA) of the former FWEC Facility. The EA included the review of plant operations; sampling and analysis for asbestos; drilling of eleven soil borings; chemical analysis of selected samples for trichloroethylene (TCE), polychlorinated biphenyls (PCBs), and oil; sampling of surface and subsurface soils in the former vapor degreaser area for TCE; sampling for PCBs in the former spill area; and sampling and analysis of the contents of the hydrotesting sump. The EA concluded that further investigation be undertaken at the former vapor degreaser, the PCBs spill site area, and the hydrotesting sump. Soil samples taken from the area close to the sealed vapor degreaser indicated concentrations of TCE ranging from 0.08 to 13.1 milligrams per kilogram (mg/kg). This area is referred to hereinafter as the Source Area Soils.

In August 1986, EPA conducted a preliminary assessment (PA) for the Site. On February 24, 1988, FWEC, EPA, and the Pennsylvania Department of Environmental Resources (PADER), now PADEP, entered into a Consent Agreement and Order, Docket Number III-88-08-DC (1988 Order). The 1988 Order required FWEC to begin the implementation of a Site Investigation Program. FWEC submitted its Site Investigation Plan to EPA and PADER in 1988, and by December 1989, FWEC had completed its Site Remediation Program Report.

Prior to purchasing the property in September 1989, MK performed investigation activities at the Site in August and September 1989. The investigation included a review of aerial photographs, a record search, a soil investigation in select areas of the former FWEC Facility, and installation and sampling of 13 groundwater monitoring wells.

Following MK's purchase of the property in September 1989, MK removed six former underground storage tanks (UST) from the Site. The following USTs were excavated and disposed of off-Site: two fuel oil USTs (1000- and 10,000-gallon) north and west of the X-Ray Building; three 30,000-gallon fuel oil USTs east-southeast of the Finish Paint Building; and one 500-gallon gasoline UST west of the southeastern corner of the Main Building.

In 1991, pursuant to the 1988 Order, FWEC implemented design and construction of an Interim Remedial Measure (IRM) consisting of a GETS to remove contaminants, specifically TCE, from groundwater through air-stripping, and to control and stabilize the contamination downgradient of the Source Area Soils and near the Site boundary. The GETS commenced operations in October 1993 and is still in operation today. Treated effluent from the GETS is discharged to the headwaters of Watering Run, a drainage feature located at the southern portion of the former FWEC Facility property. Four extraction wells, two near the Source Area Soils and two near the former FWEC Facility's southern boundary, currently remove and treat groundwater affected by TCE from the hydrostratigraphic units underlying the Site. Quarterly (1995 through September 1997), and then annual (1998 through present) sampling has been conducted to monitor the effectiveness of the GETS. The GETS has been effective in reducing groundwater contaminant concentrations at the former FWEC Facility. TCE was detected at the former FWEC Facility prior to operation of the GETS at a maximum concentration of 180,000 µg/L. The most recent maximum concentration of TCE detected at the former FWEC Facility was 2,200 µg/L in 2017.

Wabtec entered into a Consent Order and Agreement with PADEP in October 2003 (Act 2 Agreement) for Remediation/Reuse of a Special Industrial Area Site under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2). The Act 2 Agreement includes findings that the "intended use" of the former FWEC Facility is for "industrial activity and is in accordance with local zoning. The "reuse excludes developing" any portion of the former FWEC Facility "for recreational areas, schools, nursing homes, and other residential-style facilities unless a residential statewide health standard is first attained" at the former FWEC Facility and approved by PADEP. The Act 2 Agreement also includes the following restrictions: (1) prohibition on the use of groundwater at the former FWEC Facility for any purpose, (2) limiting use of the former FWEC Facility to industrial uses, and (3) restrictions on excavations in the Source Area Soils. These requirements currently remain in effect at the former FWEC Facility.

In September 2004, groundwater samples were collected from 16 wells located at residential properties along Church Road. Analytical results indicated that the detected concentrations of TCE in 15 of the 16 samples collected, ranging up to 160 micrograms per liter (µg/L). Fourteen of the samples contained concentrations of TCE above the applicable EPA Maximum Contaminant Level (MCL) of 5 µg/L (see 40 C.F.R. § 141.61(a)(5)). Bottled water was provided to affected residences, and additional samples from residential wells were collected. Carbon filtration systems were installed at residences where TCE was detected in samples collected from residential wells and were operated until the residences were permanently connected to the public water supply.

In 2005, FWEC and EPA executed an Administrative Settlement Agreement and Order by Consent for Removal Response Action for the Church Road TCE Site, dated August 29, 2005, Docket No. CERC-03-2005-0349DC (2005 Order). The 2005 Order required FWEC to perform quarterly sampling, connect affected properties to public water and abandon residential wells within the Affected Area. By July 21, 2007, FWEC had completed the final connections to public water at all 36 locations for which FWEC had received signed Water Line Agreements. For the one residence where FWEC could not secure a Water Line Agreement for connection to public water, FWEC purchased three carbon filter tanks for that residence. After the affected

residences were connected to public water, sampling was conducted quarterly at the six sentinel well properties and selected seeps within the Affected Area. The final quarterly sampling event was completed in February 2013.

On April 2, 2009, EPA and FWEC amended the 2005 Order (Amended 2005 Order) to connect four additional homes adjacent to the Affected Area to public water and to cover a groundwater seep with gravel. In December 2009, FWEC removed vegetation and placed a filter fabric and gravel over the seep to eliminate the potential for human and animal contact with groundwater contaminated with TCE. FWEC installed an enhancement to the seep IRM in September-October 2011. The enhancement consisted of installation of an electric powered aeration system to aerate the water in the man-made structure located adjacent to the seep to reduce the concentrations of TCE in the surface water seep adjacent to the structure. In September 2012, the Response Action Report was issued to close out activities required in the Amended 2005 Order.

On April 9, 2009, EPA and FWEC entered into an Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study (RI/FS AOC), Docket No. 03-CERC-2009-0061DC. Under the RI/FS AOC, FWEC agreed to investigate and evaluate cleanup options following the Superfund Alternative Approach (SAA).

FWEC commenced RI activities in 2010. Field activities included a Site reconnaissance, surface geophysical surveys, direct-push soil borings with direct sensing tools, a groundwater screening evaluation, monitoring well installation, and sampling of environmental media including soil, groundwater, surface water, sediment, pore water, porous bedrock matrix, soil vapor, and indoor air. The data were evaluated and presented in a 2018 RI Report.

From July 2016 through April 2018, EPA conducted an FS to identify alternatives for an interim remedial action based on data collected during the RI.

3.0 COMMUNITY PARTICIPATION

The RI/FS and Proposed Interim Remedial Action Plan (PRAP) were made available to the public in May 2018. These and other Site documents are contained in the Administrative Record file supporting selection of this Interim Remedial Action, which can be viewed at https://semspub.epa.gov/src/collection/03/AR65604 or at the following locations:

EPA Administrative Records Room, Attention: Administrative Coordinator 1650 Arch Street Philadelphia, PA (215) 814-3157 Hours: Monday through Friday, 8:00am to 4:30pm; by appointment only.	Marian Sutherland Kirby Library 35 Kirby Ave Mountain Top, Pa 18707 (570) 474-9313

The notice of the availability of these documents was published in the *Mountain Top Eagle*, a local newspaper, on May 9, 2018. In addition, EPA sent a fact sheet summarizing the proposed interim remedial alternatives presented in the PRAP to residences and businesses near the Site in May 2018.

Pursuant to Section 113(k)(2)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. § 9613(k)(2)(b), EPA held a 30-day comment period from May 9 through June 8, 2018, to accept public comments on the interim remedial alternatives presented in the PRAP, as well as on the other documents contained within the Administrative Record file. In addition, EPA held a public meeting on May 23, 2018, at St. Jude's School in Mountain Top, Pennsylvania, to present the PRAP to the community. At this meeting, representatives from EPA and PADEP answered questions about the interim remedial alternatives evaluated in PRAP, and EPA's Preferred Interim Alternative. A transcript of this meeting is included in the Administrative Record file. EPA's response to significant comments received during the public comment period is included in the Responsiveness Summary, which is located in Section III of this IROD.

4.0 SCOPE AND ROLE OF THE INTERIM RESPONSE ACTION

This Interim Remedial Action addresses soil, sediment, and groundwater contamination at the former FWEC Facility portion of the Site and Site-wide VI. More information is needed to screen and evaluate alternatives for contaminated groundwater at the SIPs and in the Affected Area. The final remedial action for the entire Site (former FWEC Facility, SIPS, and Affected Area), including Site-wide groundwater, will be selected in a future decision document. The Interim Remedial Action will neither be inconsistent with, nor preclude, implementation of the final remedial action for the Site.

An "interim action" is limited in scope and solely addresses areas/media that will also be addressed by a final ROD. Interim actions are implemented to:

- Take quick action to protect human health and the environment from an imminent threat in the short term while a final remedial action is being developed, or

- Institute temporary measures to stabilize the site or operable unit and/or prevent further migration of contaminants or further environmental degradation.

In this instance, it is appropriate to take an interim action in order to prevent further migration of groundwater contamination and to ensure that contamination does not reach areas where it could expose the public or the environment to unacceptable levels of contamination.

The Selected Interim Remedial Action will prevent current and potential future exposure to contaminated soils, sediments, groundwater and resultant vapors, through a combination of containment, treatment, and ICs. Although the Selected Interim Remedial Action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, it does utilize treatment technologies to reduce the toxicity, mobility, and volume of contaminants in Site media. Because the Selected Interim Remedial Action does not constitute

the final remedial action for the Site, the statutory preference for remedial actions that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this interim remedial action, will be addressed by the final remedial action.

5.0 SITE CHARACTERISTICS

5.1 Physical and Ecological Setting, Geology, Hydrogeology, and Surface Water Hydrogeology

5.1.1 General Physiographic and Ecological Setting

Regionally, ground surface elevations rise to the east of the former FWEC Facility property and generally slope downward to the north, west, and south. Immediately west of the northern portion of the former FWEC Facility and localized to this area, ground surface slopes upward to a plateau-like ridge occupied by an adjacent industrial manufacturing facility. Ground surface slopes radially from the adjacent industrial manufacturing facility, consistent with the regional topography. In the SIPs, localized ground topography is significantly impacted by the industrial development in the area. In general, south and west of the former FWEC Facility, ground surface elevations slope toward the Affected Area, with decreases in elevation from approximately 1,620 feet mean sea level (msl) at the former FWEC Facility to approximately 1,300 feet msl at the downgradient edge of the Affected Area.

The former FWEC Facility is covered by large former building cement slabs, asphalt and gravel parking lots and access roads and open field areas formerly used as storage areas. A FWWTP is also present and covers an area of approximately 0.16 acres. While evidence of wildlife occurrence on the former FWEC Facility was observed, the lack of significant habitat present in the developed portion of the former FWEC Facility limits its value for supporting significant populations of ecological receptors. The FWWTP is now a small emergent wetland that drains into an unnamed tributary of Bow Creek. It is breeding habitat for amphibians as its shallow depth and intermittent nature prevent it from supporting fish.

The Affected Area is approximately 295 acres of mixed land use centered along the main channel of Watering Run, the primary surface water feature in the Site area. This area consists of riparian, wetland and open water habitats of Watering Run. Tributaries and groundwater seeps and springs discharge along the channel course. The riparian and wetland habitats present include upland broadleaf deciduous forests, low land broadleaf deciduous forests, emergent wetland areas and ephemeral springs. The open water channel of Watering Run originates on the former FWEC Facility and flows downgradient, converging with multiple tributaries and ephemeral springs along the length of the Affected Area. The aquatic, riparian and terrestrial habitats present within the Affected Area represent the most significant habitats present at the Site.

The SIPs are also adjacent to the channel of Watering Run and downstream of the former FWEC Facility. The SIP area consists of multiple industrial and commercial properties with associated impervious asphalt parking areas, mowed lawn and landscaping features. The developed nature of the SIPs does not afford significant value as wildlife habitat. The only exceptions are isolated,

fragmented or adjacent forested areas present on the properties associated with the forested corridor of Watering Run.

5.1.2 Geology, Hydrogeology, and Surface Water Hydrology

The local geology is comprised of two primary stratigraphic units – overburden and bedrock. The overburden consists of unconsolidated glacial till with minor occurrences of fill in the SIP area. The glacial till is underlain by incompetent sedimentary bedrock, consisting of weathered bedrock underlain by highly-fractured bedrock. Less fractured, competent bedrock underlies the incompetent bedrock. The bedrock is sedimentary rock of the Catskill Formation.

Groundwater flow direction on and near the former FWEC Facility is generally to the south-southwest and, at more distal locations from the former FWEC Facility, in the Affected Area, groundwater flow direction is generally to the west. A groundwater elevation high is consistently observed in the southeast corner of the CertainTeed facility, which is located directly south of the former FWEC Facility. This groundwater elevation high results in a localized occurrence of northwesterly groundwater flow which also influences the primary groundwater flow direction to the west down the valley.

FWEC performed three rounds of groundwater sampling during the RI: May 2013 (Round1), September 2013 (Round 2), and April 2014 (Round 3). Rounds 1 and 2 were performed during relatively low rainfall periods and have a similar, westerly flow pattern, particularly in the northern portion of the former FWEC Facility. In contrast, Round 3, which was performed during a relatively high rainfall total period, shows more of a south-southwesterly flow direction. An effect on contaminant transport from this variation is not apparent. The presence of the perennial gaining stream (Watering Run) along the valley floor also helps to channel groundwater flow along the topographic contours of the valley. At a large scale, geologic structure (i.e., bedding and fracture planes) does not appear to have a significant controlling influence on groundwater flow. Groundwater flow is affected by changes in hydraulic head and geologic heterogeneity, resulting in local variability in vertically downward and upward flow gradients, as well as steeper gradients in the eastern portions of the Site and less steep gradients in the western portions of the Site.

While the distribution of hydraulic head has a net flow direction from the former FWEC Facility to the western margin of the Affected Area, locally, vertical hydraulic head gradients are complex and appear to be caused by the combined influences of the primary groundwater flow direction, extraction well operation at the former FWEC Facility, and localized artesian conditions.

Flow within the glacial till is influenced by heterogeneity, with some degree of preferential flow as a function of the differences in hydraulic conductivity. Flow within the weathered bedrock is likely to be variably influenced by the local degree of weathering, dominated by former fractures (secondary porosity). Flow within the highly-fractured bedrock and less-fractured, competent bedrock is likely to be dominated by fracture flow.

The former FWEC Facility is located at a surface water drainage divide, with the northern portion of the property draining to the north towards Bow Creek and the central and southern portions of the property draining to the south towards the surface feature that drains into Watering Run.

5.2 Nature and Extent of Contamination

5.2.1 Contaminant Presence, Fate and Transport

The RI identified 14 potential or known sources of contamination at the former FWEC Facility from prior investigation activities. Based on an evaluation of the historic documents, data obtained during previous investigations at nine (9) of the 14 potential/known sources or areas of contamination at the former FWEC Facility indicated that each of those nine areas (i) has been remediated or otherwise satisfactorily addressed, (ii) does not contain contaminants above current applicable criteria, and/or (iii) is not associated with a potential exposure pathway. No further remedial investigation of these areas was required by EPA as part of the RI. The five (5) remaining potential sources of contamination at the former FWEC Facility which were further evaluated as part of the RI include:

- Former vapor degreaser area, also known as Membrane Interface Probe (MIP) Area #1;
- Former Shot Blast Area;
- Former Expended Waste Area;
- Former Paint Storage Area near former Finish Paint Building and Buildings located east of Finish Paint Building (e.g., Solvent Building and Paint Storage Building), also known as MIP Area #2; and
- Former Wastewater Treatment Pond (FWWTP).

The following investigative activities were conducted at the Site between 2010 and 2017.

- 23 surface geophysical survey transects
- 2 MIP Surveys in suspected source areas
- 19 overburden monitoring wells installed
- 12 Rock Coring Locations
- 100 Packer Samples Collected
- 16 Bedrock Monitoring Wells Installed
- VI sampling at 37 properties, mitigation systems installed at two properties
- 58 surface water, 12 pore water, and 30 sediment samples collected

Source Area Soils

During the RI, twenty-two MIP profiles were collected at and near the Source Area Soils[1] to qualitatively characterize the occurrence of volatile organic compounds (VOCs) in the subsurface. Corresponding analytical samples from two profiles within this area contained TCE detections greater than the EPA industrial regional screening level. The investigation determined

[1] Source Area Soils were previously referred to as the former vapor degreaser area in the RI/FS and the PRAP.

that sources of chlorinated solvent-related contamination, specifically TCE and, to a lesser extent, 1,1,1-TCA remain at the former FWEC Facility, mainly in the Source Area Soils.

Surface Water, Sediment, and Pore Water

Surface water, sediment, and/or pore water samples were collected at up to 30 locations in the former FWEC Facility, SIPs, and the Affected Area. Up to 11 VOCs were detected in the surface water samples, with the concentrations less than screening criteria for all constituents except TCE. The pore water results were similar to the surface water data. Nine VOCs were detected, with TCE, carbon tetrachloride and vinyl chloride above the screening criteria.

Sediment and surface water samples were collected from the on-Site FWWTP. Both media had detections of semi-volatile organic compounds, pesticides (high flow event only), metals, and cyanide, with a portion of the detections above screening criteria.

Groundwater

The migration of constituents from impacted areas/soil matrices to groundwater, and then within groundwater following the local flow direction, is the principal environmental fate and transport mechanism for the Site. The shallow and bedrock discharge of impacted groundwater into wetland and pond areas, and/or into Watering Run and tributaries is also an environmental fate and transport mechanism.

TCE-contaminated groundwater is present within unconsolidated glacial till and bedrock, including weathered bedrock, highly-fractured bedrock, and less-fractured, competent bedrock lithologies. In the glacial till, groundwater impacts are evident near source areas on the former FWEC Facility and the SIPs, and downgradient near the western boundary of the Affected Area (**Figure 3**). In the bedrock groundwater, impacts extend from the Source Area Soils on the former FWEC Facility to within the Affected Area (**Figure 4**).

At the former FWEC Facility, the plume appears to be vertically continuous through the saturated section of the glacial till and into all bedrock lithologies, i.e., there do not appear to be distinct or isolated aquifers or hydrostratigraphic units separated by aquitards or aquitard-like conditions. Differences in the hydrogeologic properties of the glacial till and the bedrock lithologies influence migration; however, groundwater in bedrock at depth may be under confined or semi-confined conditions in the SIPs Area, where artesian wells are present. As a result, contaminant migration and/or attenuation at different locations will vary accordingly.

Based upon the local groundwater flow direction, generally south-southwest to west, and groundwater quality data, constituents in groundwater originating from the Source Area Soils at the former FWEC Facility have migrated, and will continue to migrate until dilution and removal mechanisms such as adsorption, degradation, precipitation, and limited volatilization result in their eventual non-detection and/or until the impacted groundwater discharges to the seeps/springs and/or Watering Run. Vertically, groundwater data also show that Site-related constituents have migrated to and within the bedrock via fracture flow to depths greater than 300

feet below ground surface (bgs), with concentrations significantly decreasing with increasing depth.

5.2.2 Summary of Groundwater Modeling Results

A groundwater flow, capture zone, and fate and transport model was used to simulate groundwater flow conditions for three distinct hydrostratigraphic units underlying the former FWEC Facility and SIPS.

The results of the groundwater modeling indicate that, consistent with the results of field investigations performed previously, the most permeable zone within the bedrock is estimated to be within the first 30 to 50 feet of bedrock underlying the glacial till. This is referred to as partially weathered bedrock, with decreasing permeability as the bedrock becomes increasingly competent with depth.

Although regional studies indicate that bedding plane orientation controls groundwater flow, Site specific data indicate that the primary controlling factors dictating groundwater flow direction are the overall shape of the valley, the presence of Watering Run (as a local groundwater discharge point), and the top of the bedrock surface.

The results of the groundwater modeling indicate that groundwater capture by the existing GETS is effective in times of seasonal low groundwater levels, but that some impacted flow from the former FWEC Facility may escape capture during seasonal high groundwater levels. Groundwater modeling indicated that increasing pumping rates in existing recovery wells and the addition of one new extraction well to the system would provide complete capture during all seasonal water level conditions.

5.2.3 Vapor Intrusion Investigation

VI occurs when VOCs that are released into the subsurface form hazardous vapors, which then migrate into buildings through cracks or other conduits in basement floors, walls or foundations. In 2010, FWEC performed a comprehensive VI evaluation at a total of 35 residences and public buildings within the Affected Area that were identified as having the greatest potential for VI. This evaluation considered multiple lines of evidence and concluded that the levels of TCE measured at two residences associated with unique hydrogeologic and/or subsurface conditions (residential construction on the Site of a natural spring and a leaking former well pump flooding the material beneath the foundation slab of another residence) could pose an unacceptable human health inhalation risk due to VI. As a result, active soil depressurization (ASD) mitigation systems were installed at both residences. Operation of these mitigation systems effectively eliminates this potential exposure pathway at these locations. The data and VI analysis for the Affected Area do not indicate a basis to conclude that there is a similar VI risk at other locations.

Based on approximately 10 years of groundwater data from groundwater monitoring wells and VI investigation sampling, the contaminant plume in the Affected Area appears to be stable and the contaminant concentrations have declined over time due to continued operation of the GETS at the former FWEC Facility and potentially from natural attenuation processes. In addition, the

closure and cessation of pumping at the former private wells in the Affected Area has reduced the induced migration of groundwater toward the residences. This also has led to a reduction in the concentrations VOCs beneath the structures and a corresponding reduction in potential VI at these locations. These ongoing activities and natural processes are expected to lead to further declines in the concentrations of the shallow VOC groundwater contaminants in the Affected Area, and a further reduction in the potential for VI at these locations in the future. Based on the apparent downward trend in contaminant concentrations and the installation and operation of the two VI mitigation systems, the current VI health risks for the Affected Area via the indoor air exposure pathway have been mitigated. However, a potential future VI risk will remain as long as the groundwater in the Affected Area is impacted by VOCs.

5.3 Conceptual Site Model

A conceptual site model (CSM) describes contaminant sources, contaminant release mechanisms and migration routes, exposure pathways, and potential receptors. It documents what is known about human exposure under current and potential future Site conditions.

As described above, the primary source of contamination to groundwater comes from the soils and weathered bedrock in the Source Area Soils located at the former FWEC Facility. Contamination in soils migrates into groundwater via leaching. Exposure to contaminated groundwater occurs via ingestion or dermal contact with contaminated groundwater. Groundwater can be ingested or contacted when the contamination reaches drinking water supply wells or private drinking water wells. Groundwater may also contaminate surface water or sediment if it daylights through seeps. Surface water and sediment contamination may then impact either human or ecological receptors. Groundwater contamination may also contribute to vapor intrusion and affect the indoor air in buildings. For these exposure scenarios, potential human receptors include residents (adult and child), commercial workers, trespassers, recreational users, and construction workers.

6.0 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Current land use in the vicinity of the Site is a mix of industrial, commercial and residential uses. The former FWEC Facility and the SIPs are zoned for industrial use. The Affected Area is approximately 295 acres of mixed land use (mostly residential) centered along the main channel of Watering Run and Church Rd. Future land use is anticipated to remain consistent with current land use.

The aquifer at the Site is designated by Pennsylvania as a Class IIA aquifer, a drinking water aquifer. This IROD will restore groundwater at the former FWEC Facility to beneficial reuse. Contaminated groundwater outside of the former FWEC Facility will be addressed in a subsequent decision document.

7.0 SUMMARY OF SITE RISKS

During the RI/FS, a Human Health Risk Assessment (HHRA) and Baseline Ecological Risk Assessment (BERA) were conducted to determine the current and potential future effects of contaminated media on human health and the environment in the absence of any cleanup actions at the Site.

7.1 Human Health Risk Assessment

The HHRA was conducted to characterize and quantify the current and potential future human health risks that would occur if no remedial action were taken to address contaminated media at the Site. The HHRA identifies the potential exposure pathways in which people may be exposed to Site contaminants, the toxicity of the contaminants present, and the potential for carcinogenic and non-carcinogenic effects to occur from exposure to the contaminants. EPA has set a target risk range of 10^{-4} to 10^{-6} for a lifetime excess carcinogenic risk. For non-carcinogenic contaminants, EPA sets a target of a Hazard Index (HI) of no greater than 1. Carcinogenic risks and non-carcinogenic hazards were found to be at or in exceedance of regulatory thresholds for the exposure scenarios listed below. Unless otherwise noted, risk numbers represent the hypothetical resident, which is the most sensitive receptor.

Former FWEC Facility

- Future direct contact with soil by hypothetical Residents, on-Site Commercial Workers, and Construction/utility workers:
  - Carcinogenic risk of 1.4×10^{-3};
  - Non-carcinogenic HI of 79.

- Future groundwater ingestion as tap water by hypothetical future Residents and on-Site Commercial Workers and contact during an excavation for Construction/utility Workers:
  - Carcinogenic risk of 7.3×10^{-4};
  - Non-carcinogenic HI of 85.

- Future indoor inhalation of VOCs from groundwater by hypothetical residents and on-Site Commercial Workers:
  - Carcinogenic risk of 2.2×10^{-3};
  - Non-carcinogenic HI of 274.

Affected Area

- Current use of groundwater as drinking water by residents (currently mitigated by municipal water supply connections or in-home treatment system):
  - Non-carcinogenic HI of 4.6.

- Current and future inhalation of indoor air at two residential locations (currently mitigated by active soil depressurization):
    - Carcinogenic risk of 1.7×10^{-4};
    - Non-carcinogenic HI of 25.

SIPs

- Hypothetical future resident and commercial worker via ingestion of groundwater:
    - Non-carcinogenic HI of 9.1.

- Future direct contact with shallow groundwater by a construction/utility worker in a trench.
    - Non-carcinogenic HI of 2.1.

Contaminants of Concern

Table 1 provides a summary of COCs, exposure pathways, and preliminary remediation goals. The COCs identified for each scenario are listed below, and the selected cleanup levels for each COC are presented in Section 11.2.7.

Groundwater at the Former FWEC Facility

Risk-based COCs for groundwater used as tap water, and groundwater in an excavation trench:

- TCE

Groundwater at the Affected Area

Risk-based COCs for groundwater used as tap water in the Affected Area:

- TCE

Groundwater at the Surrounding Industrial Properties

Risk-based COCs for groundwater use as tap water, and groundwater in an excavation trench:

- TCE

Indoor Air at the Former FWEC Facility

Risk-based COCs for VOCs in groundwater potentially migrating into indoor air:

- 1,1,1-Trichloroethane;
- 1,1,2-Trichloroethane;
- 1,1-Dichloroethane;
- 1,1-Dichloroethene;
- Naphthalene;
- Tetrachloroethene (PCE);
- TCE; and
- Xylenes, Total

Soil at the Former FWEC Facility

Risk-based COCs for soil in the (MIP-1) (residential use unless otherwise noted):

- 1,1,2-Trichloroethane; and
- TCE

7.2 Ecological Risk Assessment Summary

A Screening Level Ecological Risk Assessment (SLERA) was conducted to determine whether Site-related contaminants posed an unacceptable risk to ecological receptors. The conclusion of the SLERA was that contaminants posed potential risk in various media. FWEC collected additional surface water, sediment and soil samples and completed a BERA. Four assessment endpoints were evaluated in the BERA:

> Assessment Endpoint #1: Evaluate the potential for adverse changes in the survival, reproduction, and growth of resident fish populations utilizing Watering Run resulting from potential exposures to Contaminants of Potential Ecological Concern (COPECs) in surface water and sediment;
>
> Assessment Endpoint #2: Evaluate the potential for adverse changes in the survival, reproduction, and growth of resident benthic invertebrate populations utilizing the FWWTP and Watering Run resulting from potential exposures to COPECs in surface water and sediment;
>
> Assessment Endpoint #3: Evaluate the potential for adverse changes in the survival, reproduction, and growth of terrestrial plant and insect populations resulting from potential exposures to COPECs in groundwater and/or surface soil;
>
> Assessment Endpoint #4: Evaluate the potential for adverse changes in the survival, reproduction, and growth of populations of higher tropic level organisms (herbivorous, insectivorous, omnivorous, piscivorous, and carnivorous species) potentially utilizing the Site resulting from exposures to COPECs in surface water, sediment, surface soil, and/or prey.

The BERA concluded that the potential for risk to the aquatic and semi-aquatic biota inhabiting Watering Run and its tributary is negligible and does not warrant further ecological evaluation or remedial action. The potential for risk to terrestrial biota is negligible and does not warrant further ecological evaluation or remedial action. However, the potential for risk to macroinvertebrates and amphibians from COPECs in the FWWTP from the surface water and sediment contamination exceeds acceptable levels and warrants further action. Surface water and sediment COPECs for the FWWTP are listed in **Tables 2 and 3**, respectively.

Not all COPECs were selected for calculation of cleanup levels. The chemicals selected were those with elevated concentrations (above both maximum detected background and screening values) in sediment that serve as the primary risk drivers. Achieving the cleanup levels for these sediment COCs during the selected remedial action will address the other COCs which are collocated within the FWWTP. The sediment COCs for the FWWTP are listed below, and selected cleanup levels are presented in Section 11.2.7 and **Table 4. Table 4** also provides the rationale for selection of the sediment cleanup levels.

Sediment at the FWWTP

- Cadmium;
- Silver;
- Zinc; and
- Total PAHs

7.3 Risk Assessment Summary

In summary, the HHRA and BERA for the Site demonstrate the presence of unacceptable risks to human health and the environment, and that remedial actions are necessary to reduce the risks to within or below EPA's acceptable risk range. Therefore, EPA has determined that interim response actions are necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment. However, because more information is needed to select an appropriate remedial action for groundwater at the SIPs and the Affected Area, this Interim Remedial Action will only address groundwater, sediment, soil, and indoor air at the former FWEC Facility.

8.0 REMEDIAL ACTION OBJECTIVES

The following Remedial Action Objectives (RAOs) were developed to protect human health and the environment from current and potential future risk at the Site.

- Remedial Action Objectives- Groundwater:
  - Prevent future human ingestion, inhalation, or dermal contact exposure with impacted groundwater at the former FWEC Facility with COC concentrations that present unacceptable risk to human receptors.
  - Restore the groundwater aquifer at the former FWEC Facility area to its beneficial use by reducing COC concentrations to below federal drinking water MCLs, as well as to concentrations below those that would result in an unacceptable cumulative human health risk.
  - Prevent migration of the groundwater contaminant plume.

- Remedial Action Objectives - Soil:
  - Prevent future direct contact, ingestion, and inhalation exposure to surface and subsurface soil at the Site with COC concentrations that present unacceptable risks to human health (Source Area Soils).
  - Reduce leaching of COCs from Source Area Soils to reduce COC migration to groundwater.

- Remedial Action Objective - Sediment:
  - Prevent ecological receptor exposure due to ingestion of sediment and overlying surface water with COPECS above acceptable levels at the FWWTP.

- Remedial Action Objectives - Soil Vapor:
  - Prevent future human inhalation exposure due to intrusion of soil vapor COC concentrations that would result in an unacceptable risk to human health.

9.0 SUMMARY OF INTERIM REMEDIAL ACTION ALTERNATIVES

The following interim remedial action alternatives focus on the former FWEC Facility and Site-wide VI. More information is needed to screen and evaluate alternatives for groundwater at the SIPs and the Affected Area. The Affected Area and SIPs, therefore, will be addressed under subsequent remedial actions.

EPA, in consultation with PADEP, evaluated the following alternatives for the former FWEC Facility and Sitewide VI:

Alternative 1: No Action
Alternative 2: Operation and Maintenance of Existing Groundwater and VI Mitigation Systems
Alternative 3: Capping and Groundwater Extraction and Treatment System (GETS) Optimization
Alternative 4: Excavation and GETS Optimization
Alternative 5: Capping, Source Area Treatment, and GETS Optimization

Detailed cost breakdowns for all alternatives are included in Appendix B.

9.1 Common Components of Remedial Alternatives

Each of the remedial alternatives, with the exception of Alternative 1: No Action, include the following common components:

9.1.1 Institutional Controls

ICs are non-engineered administrative or legal instruments (e.g., deed restrictions, deed notices, ordinances, easements, covenants, zoning) that impose restrictions on the use of impacted property or resources to help minimize the potential for human exposure to those impacts and/or protect the integrity of the remedial action.

The ICs to be imposed at the former FWEC Facility will be maintained until groundwater meets federal MCLs for all COCs. These ICs include the following:

- Limit the former FWEC Facility property to industrial use;
- Prohibit groundwater use at the former FWEC Facility; and
- Prohibit disturbance of any remedial component at the former FWEC Facility, such as the GETS building and monitoring and extraction wells, and the soil cap.

The first two ICs listed above are currently implemented by the Act 2 Agreement described in Section 2.0 (Site History and Enforcement Activities), above, and will continue to remain in place at the former FWEC Facility. The additional ICs described in the third bullet will be implemented by modifying the existing deed restrictions or via an environmental covenant. The need for ICs in the Affected Area and the SIPs will be evaluated in a future decision document.

9.1.2 Engineering Controls

Engineering controls (ECs) encompass a variety of engineered and constructed physical systems or barriers (e.g., fences, signage, subsurface venting systems or vapor mitigation barriers) to contain and/or prevent exposure to impacted media on a property. All the alternatives, with the exception of the No Action alternative, include the following ECs, which were described above in Section 2.0 (Site History and Enforcement Activities):

1. Continued operation of the existing GETS System
2. Continued operation of the existing residential vapor mitigation systems

EPA will evaluate the need for continued ECs during each Five-Year Review, as described below. Annual inspections will be performed to verify the integrity of the ECs, including documenting evidence of unauthorized development or disturbance of remedial action infrastructure, such as fencing, signs, and monitoring wells.

9.1.3 Former Wastewater Treatment Pond

Sediments containing COPECs that pose an unacceptable risk to ecological receptors will be removed from the FWWTP and disposed of off-Site, and the pond will be restored for beneficial ecological use.

9.1.4 Five-Year Reviews

In accordance with CERCLA Section 121(c), 42 U.S.C. § 9621(c), because the Selected Interim Remedial Action will result in hazardous substances remaining on-Site above health-based levels, a review will be conducted to ensure that the Selected Interim Remedial Action continues to provide adequate protection of human health and the environment within five years after commencement of the Selected Interim Remedial Action. For the purpose of estimating costs, a period of 30 years has been assumed. Therefore, it is assumed that six (6) FYRs will be

performed, at a minimum, within the 30-year period and will continue to be conducted beyond 30 years, as necessary, until cleanup levels are achieved.

9.2 Description of Interim Remedial Action Alternatives

The following interim remedial action alternatives were developed and described in the PRAP. Total present worth costs were calculated for each alternative using an annual discount rate of 7%.

Alternative 1: No Action

Capital Cost:	*$0*
Total O&M Costs:	*$0*
Total Present Worth Cost:	*$0*

Under Alternative 1, no action would be taken at the Site. This alternative is included because the NCP requires that a "No Action" alternative be retained as a baseline alternative to which the other alternatives may be compared. For the purpose of this IROD, this alternative hypothetically assumes that all existing mitigation systems are shut down. This alternative would not reduce human health or ecological risks to acceptable levels, and would not achieve the remedial action objectives. This alternative would not be protective of human health, and will not be considered further.

Alternative 2: Operation & Maintenance of Existing Groundwater and VI Mitigation Systems

Capital Cost:	*$424,000*
Total O&M Costs:	*$4,345,000*
Total Present Worth Cost:	*$4,769,000*

Alternative 2 consists of sediment removal at the FWWTP, continued O&M of the existing GETS and the two existing VI mitigation systems, as well as mitigation at any location where unacceptable VI risk is identified in the future. Alternative 2 also includes the ICs described above to protect the interim remedial action and to prohibit any reuses of the Site that would pose a risk. Long-term groundwater monitoring would be performed in wells within the existing monitoring network on a regular basis to assess concentration trends. It is assumed that O&M on all existing mitigation systems, the GETS, and groundwater monitoring would be conducted for 30 years.

Alternative 3: Capping & GETS Optimization

Capital Cost:	*$842,000*
Total O&M Costs:	*$3,876,000*
Total Present Worth Cost:	*$4,718,000*

Alternative 3 includes all components in Alternative 2, with the addition of a cap over impacted Source Area Soils and optimization of the GETS. An engineered surface cap consisting of a 60-millimeter liner, sand, and a 6-inch soil cover would be installed over Source Area Soils. The

cap would be designed to prevent direct contact exposure and limit storm water infiltration, while incorporating existing wells in the area.

The existing GETS would continue to be operated and maintained, with a preliminary optimization strategy of increasing the withdrawal rate of one of the four (4) existing recovery wells by approximately 30 percent and installing and operating one (1) new recovery well, for a total of five (5) recovery wells. Details on the optimization would be further defined during the design phase based on the results of groundwater capture zone modeling. Preliminary results of this modeling indicate that this optimization of the existing GETS will result in full capture of the TCE plume, preventing its migration beyond the downgradient property line of the former FWEC Facility.

Alternative 4: Excavation & GETS Optimization

Capital Cost:	*$1,635,000*
Total O&M Costs:	*$3,047,000*
Total Present Worth Cost:	*$4,682,000*

Alternative 4 is identical to Alternative 3, with the exception that approximately 5,200 cubic yards of impacted Source Area Soils would be excavated and disposed of off-Site instead of capped in place. Existing wells located within the areas to be excavated would be abandoned and replaced after excavation is complete. Based on data presented in the RI, for costing purposes it is assumed soils would be disposed of off-Site as non-RCRA Hazardous contaminated waste at a Class II facility.

Alternative 5: Capping, Source Area Treatment, & GETS Optimization

Capital Cost:	*$1,218,000*
Total O&M Costs:	*$2,932,000*
Total Present Worth Cost:	*$4,150,000*

Alternative 5 is identical to Alternative 3 with the addition of SVE to treat Source Area Soils. SVE involves drilling one or more extraction wells into the contaminated soil to a depth above the water table. A blower or vacuum pump is then used to pull vapors through the soil and up the wells to the ground surface for treatment. The cap will ensure that the vacuum does not pull air from above into the system, and will also prevent any vapors from escaping from the ground to the air above. A SVE system would be installed within Source Area Soils to remove and treat VOC mass from the soils. A pilot test would be conducted to assess whether SVE can be effective at removing mass from the weathered bedrock zone directly above the water table. It is assumed that O&M on the SVE system would be conducted for 2 years, in addition to the O&M activities performed in Alternatives 3.

10.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

In this section, the interim remedial action alternatives summarized above are compared to each other using the criteria set forth in 40 C.F.R. § 300.430(e)(9)(iii). In the remedial decision-making process, EPA profiles the relative performance of each alternative against the evaluation

criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in the FS, which is in the Administrative Record file for the Site.

Evaluation Criteria for Superfund Remedial Alternatives
Threshold criteria: *Must be satisfied in order for a remedial action to be eligible for selection.*
1. 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.
2. Compliance with ARARs evaluates whether an alternative will meet all applicable or relevant and appropriate requirements (ARARSs) of Federal and State environmental statutes, regulations, and other requirements that pertain to a site, and/or justifies a waiver.
Primary balancing criteria: *Used to weigh major tradeoffs between remedial alternatives.*
3. Long-term Effectiveness and Permanence considers the expected residual risk and the ability of an alternative to maintain protection of human health and the environment over time.
4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates the anticipated performance of an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during the construction and implementation period, until cleanup goals are achieved.
6. Implementability considers the technical and administrative feasibility of implementing an alternative, including the availability of goods and services needed to implement a particular option.
7. Cost includes estimated capital and annual operations and maintenance costs, compared as present worth costs.
Modifying criteria: *Considered by EPA after public comment is received on the PRAP.*
8. State/ Support Agency Acceptance addresses whether the State concurs or has comments on the Preferred Interim Remedial Alternative, as described in the PRAP.
9. Community Acceptance considers whether the local community agrees with EPA's analysis of the Preferred Interim Remedial Alternative, as described in the PRAP.

These evaluation criteria address statutory requirements and considerations for cleanup actions in accordance with the NCP. The nine criteria fall into three groups: Threshold, Primary Balancing, and Modifying. Each alternative (except no-action) must meet the threshold criteria. The primary balancing criteria are used to weigh major trade-offs among alternatives. The modifying criteria, State and Community Acceptance, can only be fully considered after State and public comment is received on the PRAP.

10.1 Overall Protection of Human Health and the Environment

A No Action alternative (Alternative 1) must be evaluated in accordance with CERCLA and the NCP to serve as a basis for comparison with the other alternatives. Alternative 1 is not protective of human health and the environment because it does not address the unacceptable exposures to contaminated soil, sediment, groundwater and indoor air described in Section 7.0 (Summary of Site Risks). The No Action alternative fails to meet the threshold criterion of protectiveness and will not be considered further.

The remaining four alternatives would provide overall protection of human health and the environment through the remediation of soil, sediment and groundwater at the former FWEC Facility, the use of VI mitigation systems, and the ECs and ICs described above.

10.2 Compliance with ARARs

Table 5 provides the list of ARARs identified for the retained alternatives and describes how the alternatives will comply with the ARARs. Alternatives 2 through 5 will comply with all ARARs except for federal MCLs for groundwater beyond the former FWEC Facility. The Selected Interim Remedial Action will address the Source Area Soils, FWWTP, and groundwater at the former FWEC Facility only and is intended to prevent further migration of contaminated groundwater. However, more information is needed to screen and evaluate alternatives for contaminated groundwater at the SIPs and in the Affected Area. Therefore, EPA will waive the MCL as an ARAR for the SIPs and the Affected Area in the interim until such a time as a final remedial action for Site-wide groundwater can be selected. Section 121(d)(4)(A) of CERCLA provides that EPA may select a remedial action that does not meet an applicable or relevant and appropriate standard, requirement, criteria, or limitation if the remedial action is only part of a total remedial action that will attain such level or standard of control when completed. Because this interim remedial action is part of a total remedial action that will meet ARARs when completed, EPA will waive ARARs establishing groundwater cleanup levels beyond the former FWEC Facility.

Specifically, EPA is waiving the requirement that all Site groundwater meet MCLs for COCs established pursuant to the Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq. These requirements are waived pursuant to the interim action waiver set forth in Section 121(d)(4)(A) of CERCLA and 40 C.F.R. § 430(f)(1)(ii)(C)(1). MCLs are not waived for and will be achieved at the former FWEC Facility.

10.3 Long-Term Effectiveness and Permanence

All four alternatives have the same degree of long-term effectiveness and permanence for contaminated sediment, as all four include removal of contaminated sediment in the FWWTP.

Alternative 2 would have a low degree of long-term effectiveness and permanence compared to the other alternatives as it does not include active remediation of Source Area Soils, nor optimization of the GETS. Alternative 2 would not achieve soil RAOs, and would likely require an unreasonable amount of time to reach groundwater RAOs.

Alternative 3 would have a moderate degree of long-term effectiveness and permanence compared to the other alternatives. Capping Source Area Soils will prevent exposure to contaminants, as well as reduce the likelihood of contaminants leaching to groundwater. Optimizing the GETS will clean up groundwater more quickly than continuing to operate the GETS under current conditions. Alternative 3 may be less effective than Alternatives 4 and 5 in the long term because it does not treat or remove Source Area Soils.

Alternative 4 would offer a high degree of long term effectiveness and permanence by removing impacted soils and transferring them off-Site, which would eliminate exposure to contaminants as well as prevent those contaminants from impacting groundwater. As with Alternative 3, optimization of the GETS will clean up the groundwater more quickly than continuing to operate the GETS under current conditions.

Alternative 5 would offer a high degree of long term effectiveness and permanence by capping and treating impacted Source Area Soils. As with Alternative 4, this would eliminate both exposure to soil contamination, as well as the leaching of soil contamination to groundwater. As with Alternatives 3 and 4, optimization of the GETS will clean up the groundwater more quickly than continuing to operate the GETS under current conditions.

10.4 Reduction of Toxicity, Mobility, or Volume through Treatment

All the remaining alternatives will reduce the toxicity, mobility, and volume of contaminants in sediment (through removal) and groundwater (through treatment by the GETS). Alternative 2 would be less effective in treating groundwater than Alternatives 3, 4, and 5 because Alternative 2 does not include GETS optimization.

Alternative 5 is the only alternative that would reduce the toxicity, mobility, and volume of COCs in Source Area Soils through treatment by SVE. Alternatives 2, 3, and 4 would not reduce the toxicity, mobility, and volume of COCs because they do not contain a treatment component for contaminated soils.

10.5 Short-Term Effectiveness

For Alternatives 2, 3, 4, and 5, the period of time needed to implement each alternative would be similar. Alternative 2 would likely take the shortest amount of time, as it only involves sediment removal and restoration of the FWWTP. Short term protectiveness would be provided by implementing measures to protect remedial construction workers, and through compliance with Occupational Safety and Health Administration (OSHA) work standards during sediment removal and restoration at the FWWTP, capping of soils (Alternatives 3 and 5), excavation and off-Site disposal of soils (Alternative 4), and treatment of Source Area Soils (Alternative 5). Implementation of Alternatives 2, 3, 4, and 5 are not expected to pose any risk to residents from construction activities because there are no residents in the immediate vicinity of the former FWEC Facility.

10.6 Implementability

All the remaining alternatives are readily implementable from a technical and administrative feasibility perspective. However, Alternative 2 would be easier to implement from a technical perspective than Alternatives 3, 4, and 5, because it only requires sediment removal and restoration at the FWWTP, the implementation of ICs and continued O&M of the existing GETS. Of the remaining 3 alternatives, Alternative 4 may be more difficult than Alternatives 3 and 5 to implement due to the difficulty of excavating contaminated soils from the glacial till and weathered bedrock. The implementation of Alternative 5 may also be difficult because of the challenges of extracting soil vapor through the compact glacial till. These difficulties would be addressed to the extent practicable by performing a pilot test prior to implementing full-scale SVE and modifying the design of the SVE system accordingly. Treatment of groundwater under Alternatives 2, 3, 4, and 5 would be easily implementable because the existing GETS is already installed and has been in operation for many years. The existing GETS can continue to operate with optimizations that would be easy to implement to improve its effectiveness, as described above.

10.7 Cost

Estimated costs associated with implementation of the remedial alternatives are presented in **Table 6**. The alternatives all have relatively similar cost estimates. Alternative 5 has the lowest present value costs ($4,150,000), while Alternative 2 has the highest present value cost ($4,769,000). The costs for Alternative 2 are higher than Alternatives 3, 4, and 5 because it is assumed that the GETS system will have to operate longer and will have more O&M costs as a result.

10.8 State Acceptance

PADEP concurred with the selection of Alternative 5 in a letter dated August 28, 2018.

10.9 Community Acceptance

EPA held a 30-day public comment period from May 9, 2018 through June 8, 2018, to accept public comments on the interim remedial action alternatives presented in the PRAP and on the other documents contained in the Administrative Record file compiled in support of the selection of the Interim Remedial Action. On May 23, 2018, EPA held a public meeting to discuss the PRAP and accept comments. A transcript of this meeting is included in the Administrative Record file. Several significant comments and questions from the public meeting are included in the Responsiveness Summary, which is located in Section III of this IROD. No additional comments were received outside of the public meeting.

11.0 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable (40 C.F.R. Section 300.430(a)(1)(iii)(A)). The principal threat concept is applied to the characterization of source materials at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination, for example, to ground water. Principal threat wastes are those source materials considered to be highly toxic or highly mobile, which would present a significant risk to human health or the environment should exposure occur.

EPA has not identified any principal threat waste at the Site. The Source Area Soils at the former FWEC Facility are considered a low-level threat waste.

12.0 SELECTED INTERIM REMEDIAL ACTION

Following review and consideration of the information in the Administrative Record file supporting selection of this interim remedial action, the requirements of CERCLA and the NCP, public comments, EPA has selected ***Alternative 5: Capping, Source Area Treatment, & GETS Optimization*** as the Selected Interim Remedial Action for the former FWEC Facility and Site-wide VI.

12.1 Summary of the Rationale for the Selected Interim Remedial Action

EPA's Selected Interim Remedial Action meets the threshold criteria and provides the best balance of tradeoffs with respect to the balancing criteria. EPA expects the Selected Interim Remedial Action to satisfy the following statutory requirements of CERCLA § 121, 42 U.S.C. § 9621:

1) be protective of human health and the environment;
2) comply with ARARs (or justify a waiver);
3) be cost-effective;
4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and
5) satisfy the preference for treatment as a principal element.

The Selected Interim Remedial Action is protective of human health and the environment, it will comply with ARARs, it uses treatment to the maximum extent practicable, it is readily implementable, and the alternative is cost-effective.

Alternative 1 does not meet the threshold criteria to be a viable remedial action. Alternative 2 has a low degree of long-term effectiveness because it does not address Source Area Soils, it does not include optimization of the GETS, and it would likely take an unreasonable amount of time to reach cleanup levels.

Of the remaining three alternatives, Alternative 5 is the only alternative that includes treatment of Source Area Soils. In addition, the estimated cost for Alternative 5 is less than Alternatives 3 and 4, because it is expected to meet cleanup levels more quickly.

12.2 Description of the Selected Interim Remedial Action and Performance Standards

Based on the comparison of the nine criteria, EPA's Selected Interim Remedial Action is ***Alternative 5: Capping, Source Area Treatment, & GETS Optimization.*** EPA has determined that the Selected Interim Remedial Action will be the most effective in addressing contaminated sediment, soil, and groundwater at the former FWEC Facility, as well as Site-wide VI. This Alternative includes the following components:

- Continued groundwater extraction and treatment using the existing GETS;
- Optimization of the GETS;
- Capping and SVE treatment of Source Area Soils;
- Sediment removal and wetland restoration at the FWWTP;
- VI monitoring and mitigation;
- Groundwater monitoring; and
- Land and groundwater use restrictions.

12.2.1 Continued Operation and Optimization of the Existing GETS & Groundwater Monitoring

Previous groundwater modeling indicates that groundwater capture by the existing GETS is effective in times of seasonal low groundwater levels, but that some impacted flow from the former FWEC Facility may escape capture during seasonal high groundwater levels. The modeling also indicates that increasing pumping rates in existing recovery wells and the addition of one new extraction well to the system would provide complete capture during all seasonal water level conditions. Groundwater cleanup levels are listed in Section 12.2.7.1. The performance standards listed below shall be used for the groundwater extraction and treatment portion of the remedial action.

1. Treat and discharge groundwater to meet the substantive Pennsylvania Water Quality Standards for groundwater COCs.

2. Monitor air emissions in accordance with OSWER Directive 9355.0-28: *Control of Air Emissions from Air Strippers at Superfund Groundwater Sites* (June 15, 1989).

3. Perform a capture zone analysis after optimization of the GETS to ensure full capture of the plume at the former FWEC Facility, and every five years thereafter.

4. Monitor groundwater for containment and capture of the GETS. Evaluate VOC concentration trends over time and contaminant plume stability.

5. Extract and treat groundwater until cleanup levels are achieved throughout the contaminant plume at the former FWEC Facility for groundwater COCs.

6. Once the numerical cleanup levels are achieved, perform a cumulative risk assessment to ensure that exposure to groundwater would result in a cumulative excess carcinogenic risk of less than or equal to 10^{-6} and a cumulative excess non-carcinogenic HI of less than or equal to 1.

12.2.2 Cap over Source Area Soils

The cap over Source Area Soils will be applied where contamination exceeds the cleanup levels for soil COCs, which are the PADEP Act 2 soil-to-groundwater Medium Specific Concentration (MSCs) for a residential, used aquifer. Soil cleanup levels are listed in Section 12.2.7.2. The cap shall meet the requirements listed below.

1. Provide long-term minimization of the migration of liquids through the cap.
2. Function with minimum maintenance.
3. Promote drainage and minimize erosion or abrasion of the final cover.
4. Accommodate settling and subsidence so that the cover's integrity is maintained.
5. The cap shall have a permeability less than or equal to 1×10^{-7} cm/sec.

12.2.3 Soil Vapor Extraction

Before installation of a full-scale SVE system, a pilot test will be conducted within the capped area of the Source Area Soils to ensure that this technology will be effective. The performance standards listed below shall be used as a baseline for the pilot test, but they may be modified as more data are collected during the pilot test design. Full-scale operation of the SVE system shall be performed where the pilot test performance standards are achieved within the capped area of the Source Area Soils. Performance criteria for full-scale operation of the SVE system (if implemented) will be developed during the design phase.

1. Achieve an air flow rate greater than 15 standard cubic feet per minute (scfm) at vacuum levels less than 16 inches of mercury (in Hg) through the impacted soil and/or weathered bedrock zones.
2. Achieve a 30-day time interval radius of influence of 10 feet or greater in all lateral directions from the extraction well.
3. Achieve soil air-phase permeabilities greater than 1×10^{-10} square centimeters (cm^2).
4. Chemicals shall be volatile and exhibit appropriate Henry's Law constants (0.01 dimensionless) and vapor pressures (0.1 mm Hg) for effective removal by SVE.
5. Depth to water table shall exceed 10 feet.

6. Highly permeable fill or man-made passageways (e.g., sewers, pipe ways, or soil/weathered bedrock preferential pathways) should be absent to minimize airflow short circuiting or preferential flow.

12.2.4 Sediment Removal

1. Remove sediments that exceed the FWWTP cleanup levels for sediments COCs, listed in Section 12.2.7.3.

2. Monitor reestablishment of native wetland vegetation. If this does not occur within a reasonable timeframe, active restoration may be required.

12.2.5 Vapor Intrusion Monitoring and Mitigation

Conduct vapor intrusion sampling at any new construction within 100 feet of the contaminated groundwater plume, and at existing structures if concentrations of contaminants in groundwater increase by an order of magnitude.

1. Vapor intrusion sampling shall consist of sub-slab, indoor air, and outdoor air sampling at each location, where practicable, in accordance with current EPA guidance.

2. Conduct vapor intrusion mitigation where multiple lines of evidence, such as sub-slab,[2] indoor air, and/or outdoor air sampling results, indicate that actual or potential migration of Site-related compounds from contaminated groundwater to indoor air would result in a cumulative excess carcinogenic risk of greater than or equal to 10^{-4} and/or a cumulative excess non-carcinogenic Hazard Index (HI) greater than 1.

3. Vapor intrusion mitigation shall continue until:

    a) Groundwater beneath or within 100 lateral or vertical feet of the mitigated structure meets cleanup levels for groundwater COCs, and

[2] In order to evaluate the potential risk posed to human health by sub-slab soil vapor, an attenuation factor shall be applied to the sub-slab soil vapor data to represent the extent to which sub-slab soil vapor is expected to enter the indoor air of a structure. For the purposes of this IROD, and in accordance with current EPA guidance at the time of the IROD, an attenuation factor of 0.03 shall be utilized.

b) Sub-slab concentrations are below the cleanup levels listed in Section 12.2.7.4 and indoor air and/or outdoor air sampling results indicate that actual or potential migration of Site-related compounds from contaminated groundwater to indoor air would result in a cumulative excess carcinogenic risk of less than or equal to 10^{-6} and a cumulative excess non-carcinogenic HI of less than or equal to 1.

12.2.6 Institutional Controls

The ICs shall consist of the following requirements:

1. Use and/or contact with groundwater at the former FWEC Facility, via ingestion, dermal contact, or vapor inhalation, within the contaminated plume that would result in unacceptable risks to human health shall be prohibited until cleanup levels for groundwater COCs are achieved throughout the plume at the former FWEC Facility.

2. Activities that adversely impact the Selected Interim Remedial Action, such as excavation or construction, shall be prohibited without EPA's prior written approval.

3. Conduct vapor intrusion sampling at any new construction within 100 feet of the contaminant plume:

    a) Vapor intrusion sampling shall consist of sub-slab, indoor air, and outdoor air sampling at each location, where practicable, in accordance with current EPA guidance;

    b) Vapor intrusion mitigation shall be conducted if multiple lines of evidence, such as sub-slab, indoor air, and/or outdoor air sampling results, indicate that actual or potential migration of Site-related compounds from contaminated groundwater to indoor air would result in a cumulative excess carcinogenic risk of greater than or equal to 10^{-4} and/or a cumulative excess non-carcinogenic HI greater than 1.

    c) Vapor intrusion mitigation shall continue until:

        i. Groundwater beneath or within 100 lateral or vertical feet of the mitigated structure meets cleanup levels for groundwater COCs, and

        ii. Sub-slab concentrations are below the cleanup levels listed in Section 12.2.7.4 and indoor air and/or outdoor air sampling results indicate that actual or potential migration of Site-related compounds from contaminated groundwater to indoor air would result in a cumulative excess carcinogenic risk of less than or equal to 10^{-6} and a cumulative excess non-carcinogenic HI of less than or equal to 1.

12.2.7 Cleanup Levels

The Selected Interim Remedial Action shall achieve the following cleanup levels:

12.2.7.1 Groundwater

Contaminant	Cleanup Level (µg/L)
Trichloroethene	5.0

µg/L = micrograms per Liter

12.2.7.2 Soil (Source Area Soils)

Contaminant	Cleanup Level (mg/kg)
Trichloroethene	0.5
1,1,2-Trichloroethane	0.5

mg/kg = milligrams per kilogram

12.2.7.3 Sediment (FWWTP)

Contaminant	Cleanup Level (mg/kg)
Cadmium	2.22
Silver	1.48
Zinc	235.67
Total PAHs	6.06

12.2.7.4 Vapor Intrusion (sub-slab)

Contaminant	Cleanup Level (µg/m^3)
1,1,1-Trichloroethane	170,000
1,1,2-Trichloroethane	5.8
1,1-Dichloroethane	58
1,1-Dichloroethene	7000
Naphthalene	2.8
Tetrachloroethene	360
Trichloroethene	16
Xylenes, Total	3500

(µg/m^3) = micrograms per cubic meter

12.3 Summary of the Estimated Selected Interim Remedial Action Costs

The estimated present worth cost of the Selected Interim Remedial Action is $4,150,000. The information in the cost summary table (**Table 6 & Appendix B**) is based on the best available information regarding the anticipated scope of the Selected Interim Remedial Action. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the Selected Interim Remedial Action. Major changes to the Selected Interim Remedial Action may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences (ESD), or a ROD

Amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

12.4 Expected Outcomes of the Selected Interim Remedial Action

Implementation of the Selected Interim Remedial Action will reduce the volume, toxicity and mobility of contaminants in Source Area Soils at the former FWEC Facility through capping and SVE treatment. This will reduce the amount of contamination leaching from soil and weathered bedrock into groundwater at the former FWEC Facility.

Continued operation and optimization of the GETS will prevent further migration of contaminated groundwater from the former FWEC Facility, and will continue restoration of the groundwater to beneficial use by reducing the volume of contaminated groundwater within the former FWEC Facility.

Continued operation of the existing vapor mitigation systems effectively eliminates any unacceptable risk from VI at the Site. Groundwater monitoring will identify any additional locations that may require VI sampling and mitigation, if necessary.

The removal of contaminated sediment from the FWWTP will eliminate any unacceptable ecological risk from Site-related contaminants.

The ICs selected as part of this Interim Remedial Action will protect the integrity of the Interim Remedial Action, while allowing the former FWEC Facility to be utilized for industrial purposes.

The Selected Interim Remedial Action will be consistent with any subsequent remedial actions to address the remaining contaminated groundwater at the Site.

13.0 STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, EPA must select a remedial action that is protective of human health and the environment, complies with ARARs that are not waived, is cost-effective, and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Additionally, CERCLA includes a preference for remedies that use treatment to significantly and permanently reduce the volume, toxicity or mobility of hazardous substances as a principal element. The following sections discuss how the Selected Interim Remedial Action meets these statutory requirements.

13.1 Protection of Human Health and the Environment

The Selected Interim Remedial Action will protect human health and the environment through the remediation of soil, sediment, and groundwater at the former FWEC Facility, the use of VI mitigation systems where necessary, and the use of ICs to prevent human and ecological exposures to contamination where necessary.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The Selected Interim Remedial Action will comply with ARARs that are not waived. Section 121(d)(4)(A) of CERCLA provides that EPA may select a remedial action that does not meet an applicable or relevant and appropriate standard, requirement, criteria, or limitation if the remedial action is only part of a total remedial action that will attain such level or standard of control when completed. Because this is an Interim Remedial Action, which does not seek complete restoration of the aquifer, EPA is waiving, and the Selected Interim Remedial Action is not required to meet, ARARs establishing groundwater cleanup levels in the SIPs and Affected Area (see Section 10.2 "Compliance with ARARs"). These requirements are waived in the Selected Interim Remedial Action pursuant to the interim action waiver set forth in Section 121(d)(4)(A) of CERCLA and 40 C.F.R. § 300.430(f)(1)(ii)(C)(1). ARARs establishing groundwater cleanup levels are not waived for and will be achieved at the former FWEC Facility.

ARARs for the Selected Interim Remedial Action that are not waived include, among others, Federal and State regulations covering dust suppression, erosion control, disposal requirements and other construction-related activities, as well as Federal and State regulations covering discharge of contaminants to surface water from the GETS. The Selected Interim Remedial Action will attain all ARARs that are identified in **Table 5**.

13.3 Cost Effectiveness

The Selected Interim Remedial Action is cost-effective in providing overall protection of human health and the environment by eliminating the risk posed by Site COCs and meets all other requirements of CERCLA and the NCP at a cost that is proportional to the other alternatives that were evaluated. The estimated present worth cost for the Selected Interim Remedial Action is $4,150,000.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Interim Remedial Action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. Extraction and treatment of contaminated groundwater at the former FWEC Facility, SVE treatment of Source Area Soils, and excavation and offsite disposal of sediment from the FWWTP will permanently eliminate the threats to human health and the environment by permanently removing the contaminants from groundwater, soil, and sediment. The Selected Interim Remedial Action does not include alternative treatment technologies; however, the proven technologies used in the Selected Interim Remedial Action achieve risk reduction and protectiveness in the most cost-effective manner. Although the groundwater contamination at the SIPS and in the Affected Area is not addressed in this IROD, the Selected Interim Remedial Action represents the best balance of trade-offs among the alternatives with respect to pertinent criteria, given the limited scope of the action.

13.5 Preference for Treatment as a Principal Element

The Selected Interim Remedial Action satisfies the statutory preference for treatment by employing it as a principal element. The GETS utilizes air stripping to treat contamination in extracted groundwater, and the SVE system will treat soil contamination in its vapor phase. This preference for treatment as a principal element will also be addressed in the final decision document for the Site.

13.6 Five-Year Review Requirements

Because the Selected Interim Remedial Action will result in hazardous substances remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted every five years after initiation of the Selected Interim Remedial Action to ensure that the Selected Interim Remedial Action is, or will be, protective of human health and the environment pursuant to CERCLA Section 121(c) and the NCP, 40 C.F.R. § 300.430(f)(4)(ii).

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

There have been no significant or fundamental changes to the proposed Interim Remedial Action as a result of public comments.

III. RESPONSIVENESS SUMMARY

FOSTER WHEELER ENERGY CORPORATION/CHURCH ROAD TCE SUPERFUND SITE INTERIM REMEDIAL ACTION

MOUNTAIN TOP, LUZERNE COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

This Responsiveness Summary provides a summary of significant public comments and concerns regarding the PRAP for the Site and provides EPA's responses to those comments. After reviewing and considering all public comments received during the public comment period, EPA's Selected Interim Remedial Action is ***Alternative 5: Capping, Source Area Treatment, & GETS Optimization*** for the Site.

The PRAP and supporting documentation were made available to the public in the Administrative Record file, which was compiled to support selection of this Interim Remedial Action. EPA provided notice to the public that the Administrative Record file could be viewed online at https://semspub.epa.gov/src/collection/03/AR65604, or at the following locations:

Marian Sutherland Kirby Library
35 Kirby Ave
Mountain Top, Pa 18707
(570) 474-9313

EPA Administrative Records Room
Administrative Coordinator
1650 Arch Street
Philadelphia, PA 19103
Phone: (215) 814-3157
Hours: Monday-Friday 8:30 am to 4:30pm
By appointment only

The notice of availability of these documents was published in the *Mountain Top Eagle*, a local newspaper, on May 9, 2018. In addition, EPA sent a fact sheet summarizing EPA's preferred interim remedial action alternative to residences and businesses near the Site in May 2018.

EPA held a 30-day comment period from May 9 through June 8, 2018, to accept public comments on the interim remedial alternatives presented in the PRAP, as well as on the other documents contained within the Administrative Record file. On May 23, 2018, EPA held a public meeting at St. Jude's School in Mountain Top, Pennsylvania, to inform local officials, interested citizens, and other stakeholders in attendance about EPA's proposed cleanup plan and the Superfund process, to respond to questions, and to receive comments on the PRAP. A transcript of this meeting is included in the Administrative Record file. Responses to significant comments received at the public meeting are included in this Responsiveness Summary. EPA did not receive any comments or questions outside of the May 23, 2018 public meeting.

2.0 RESPONSES TO SIGNIFICANT COMMENTS RAISED DURING THE MAY 23, 2018 PUBLIC MEETING

2.1 Location and Timeframe for the Remedial Action

Two citizens had questions about where the Proposed Interim Remedial Action would be conducted, and for how long.

EPA Response: All of the construction-type work will take place at the former FWEC Facility (**Figure 5**). This includes installation of an additional extraction well, installation of the SVE system and cap, and sediment removal/restoration at the FWWTP. This work will likely take place over the next three to four years, once the design and planning are complete.

Groundwater extraction, treatment and monitoring will be conducted until groundwater cleanup levels are achieved. Although this Interim Remedial Action only addresses groundwater at the former FWEC Facility, it is anticipated that groundwater at the SIPs and Affected Area will also be addressed to achieve groundwater cleanup levels at a later date in a final remedial action for the Site. EPA currently anticipates that groundwater cleanup levels will be achieved Site-wide in approximately 20 to 30 years, during which time EPA and FWEC will maintain a presence in the area to operate and maintain the GETS and periodically perform groundwater monitoring. Groundwater monitoring is being and will continue to be conducted in all three portions of the Site: the former FWEC facility, the SIPS, and the Affected Area.

2.2 Air Emissions

A citizen asked how EPA and FWEC will address emissions released into the ambient air from the SVE and GETS?

EPA Response: Air emissions from the GETS are not monitored on a regular basis because the amount of VOCs removed from groundwater is well below any thresholds that would require air monitoring.

EPA issued guidance, OSWER Directive 9355.0-28: *Control of Air Emissions from Air Strippers at Superfund Groundwater Sites* (June 15, 1989), on the potential need for air emission controls on air strippers at Superfund sites for groundwater treatment. The policy states that for sites located in areas that are attaining the National Ambient Air Quality Standards for ozone attainment areas, the requirement for controls should be based on existing agency policy in response to state ARARs, risk management guidelines, and CERCLA requirements.

Although currently in attainment, all of Pennsylvania, including Luzerne County, is in the Northeast Ozone Transport Region[3] where the major source threshold for VOCs is 50 tons per year (tpy). Pursuant to the 1988 Order, FWEC implemented the design and construction of the GETS as an Interim Remedial Measure (IRM). The Design Report for the GETS calculated

[3] The Northeast Ozone Transport Region is comprised of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Pennsylvania and Vermont.

maximum TCE emission potential to the atmosphere of no more than 20 pounds per day (lbs/d), which would result in less than 4 tpy.

Using data from *Progress Report #85 (IRM Operating Phase) Foster Wheeler Energy Corporation Mountain Top, PA Site* (December 2017), FWEC calculated hourly, daily, and annual actual TCE/VOC emissions for 2016-2017 as follows:

0.082 kg/d x 2.205 lbs/kg x 1 d/24 hrs = ***0.0075 lbs/hr***
0.082 kg/d x 2.205 lbs/kg = ***0.18 lbs/d***
0.082 kg/d x 2.205 lbs/kg x 365 d/yr x 1 ton/2,000 lbs = ***0.033 tpy***

FWEC also calculated potential TCE/VOC emissions, with the assumption that the maximum TCE concentration detected in the GETS extraction wells is passed through the air strippers at the design capacity flow rate of the air strippers. The current maximum observed groundwater TCE concentration is 0.77 milligram/liter (mg/L); however, a more conservative concentration of 1 mg/L was used for this evaluation. Each air stripper has a design capacity of 120 gallons per minute (gals/min), or 240 gals/min for both combined.

Hourly, daily, and annual potential TCE/VOC emissions are calculated as follows:

1 mg/L x 3.785 liters per gallon (L/gal) x 1 gallon/1,000 milligrams (gals/mg) x 1 lb/453.6 g x 240 (gals/min) x 60 minutes per hour (min/hr) = ***0.12 lb/hr***
1 mg/L x 3.785 L/gal x 1 g/1,000 mg x 1 lb/453.6 g x 250 gals/min x 60 min/hr x 24 hr/d = ***2.88 lb/d***
1 mg/L x 3.785 L/gal x 1 g/1,000 mg x 1 lb/453.6 g x 250 gals/min x 60 min/hr x 8,760 hr/yr x 1 ton/2,000 lbs = ***0.53 tpy***

Based on this evaluation, the potential maximum emissions from the GETS are well below the 50 tpy threshold. For more information on this subject, FWEC submitted a June 2018 *Evaluation of Air Emissions* document for the Site, which is included in the Administrative Record file for this IROD.

While the SVE system has yet to be designed, it is not expected to remove more than 15 to 20 lbs of TCE per year. If, during design, it appears that air emissions from the SVE system could exceed the 50 tpy threshold, the system will be designed to run effluent air through granular activated carbon units, or other treatment media, to remove TCE before its emitted to the atmosphere.

2.3 Alternative Groundwater Technologies

A citizen asked if EPA and FWEC had considered any technologies besides extraction and treatment for cleaning up groundwater at the Site.

EPA Response: Several alternative options for cleaning up groundwater were assessed as part of the FS, including in-situ chemical oxidation, in-situ enhanced biodegradation, single or dual phase thermal recovery, in-well air stripping, air sparging and bio-sparging. These technologies

were screened out for several reasons. The low permeability and heterogeneity of the geology (glacial till and bedrock) at the Site would have made them difficult to implement. In addition, the byproducts from any injectants could have the potential to cause long-term negative impacts to the aquifer. Finally, the GETS has already been built and has proven to be effective in reducing contamination concentrations in groundwater at the Site.

2.4 Surrounding Industrial Properties (SIPs)

A citizen asked if there might be additional sources from the SIPs contributing to the groundwater contamination.

EPA Response: The SIPs were investigated during the RI, but a definitive source was not identified that could be differentiated from the contamination coming from the former FWEC Facility. Therefore, while it is possible that a portion of the contamination may be coming from the SIPs area, EPA and FWEC have proceeded as though the source is coming entirely from the former FWEC Facility. Groundwater alternatives for the SIPs are still being evaluated, and a remedial action will be selected in a future decision document.

2.5 Vapor Intrusion Sampling (VI)

A citizen asked if EPA plans to perform additional sampling for VI.

EPA Response: As discussed in Section 5.2.3, above, FWEC performed a comprehensive VI evaluation at residences and public buildings within the Affected Area that were identified as having the greatest potential for VI. This evaluation considered multiple lines of evidence and concluded that the levels of TCE measured at two residences associated with unique hydrogeologic and/or subsurface conditions (i.e., residential construction on the Site of a natural spring and a leaking former well pump flooding the material beneath the foundation slab of another residence) could pose an unacceptable human health inhalation risk due to VI. As a result, VI mitigation systems were installed at both residences. Operation of these mitigation systems effectively eliminates this potential exposure pathway at these locations. The data and VI analysis for the Affected Area do not indicate a basis to conclude that there is a similar VI risk at other locations.

EPA will continue to evaluate the need for VI sampling based on the concentrations of contaminants in groundwater. If groundwater contamination increases by an order of magnitude or spreads to a new location, neither or which are expected to happen, EPA will evaluate the need for additional VI sampling in those areas.

2.6 Decreasing Size of Contaminant Plume

A citizen asked EPA to describe the mechanism by which the groundwater plume is shrinking, and whether or not the contamination may be simply migrating deeper.

EPA Response: The GETS has been effective in reducing groundwater contamination over the past 25 years. In 1989, the maximum TCE concentration was 180,000 ug/L. During the September 2017 sampling event, the maximum concentration was 2,200 ug/L. In addition, it is

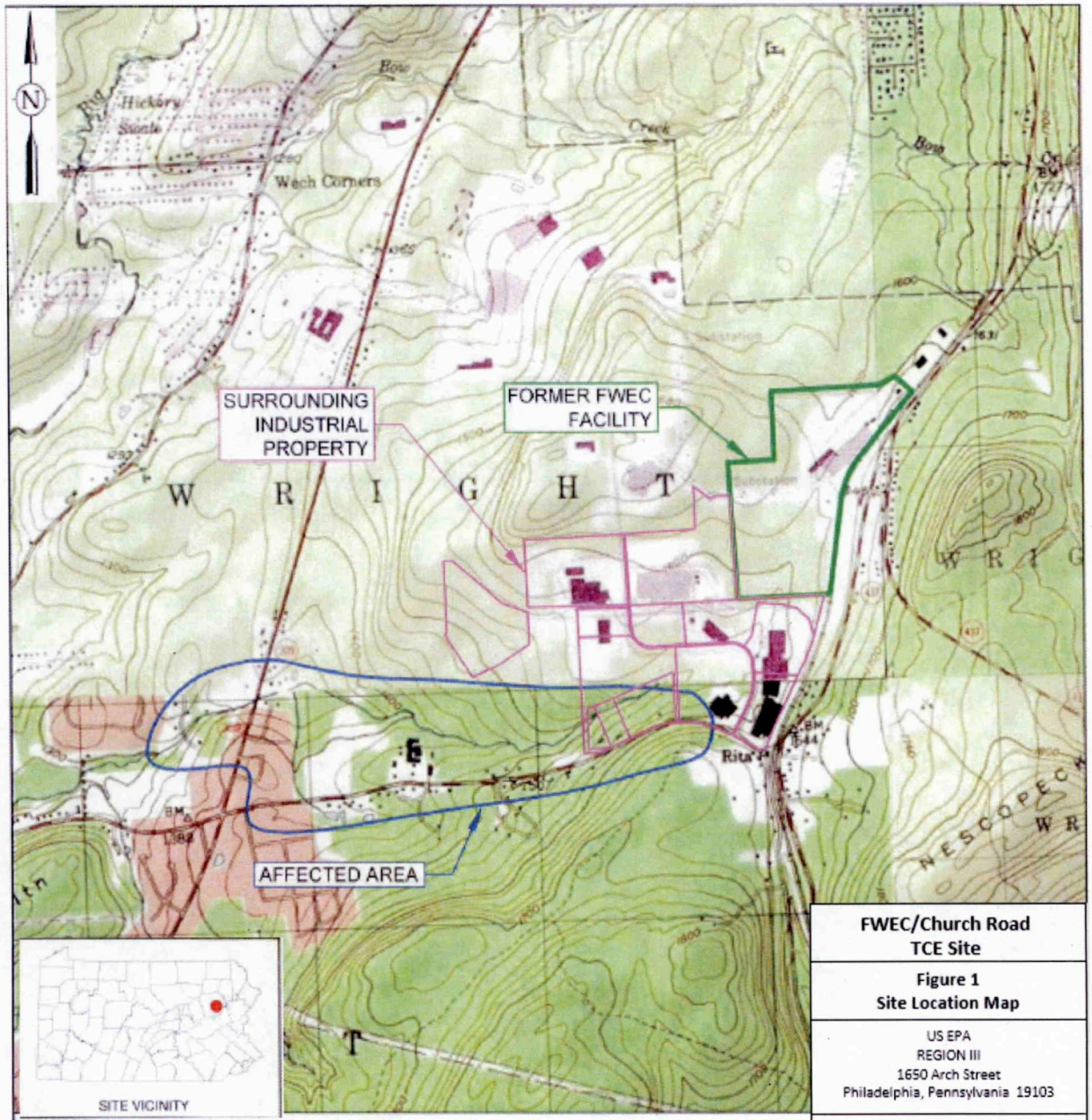
highly likely that groundwater contamination in the Affected Area has also been cleaned up to some extent through natural attenuation processes, such as dilution and dispersion. This will be studied further over the next several years. Topographically, the Affected Area sits in a valley and Watering Run receives all groundwater from the surrounding topographic high points. Upward potentiometric gradients have been observed in the SIPS and Affected Areas, including artesian conditions in some places. By the time groundwater discharges into Watering Run, contaminant levels are so low that they are undetectable. Likewise, EPA has never found any evidence that groundwater contamination has migrated deeper into bedrock. Investigations have shown that bedrock becomes more competent and less fractured with depth, and groundwater contamination decreases with depth in all monitoring wells at the Site, and is primarily present in the overburden/bedrock interface in weathered bedrock.

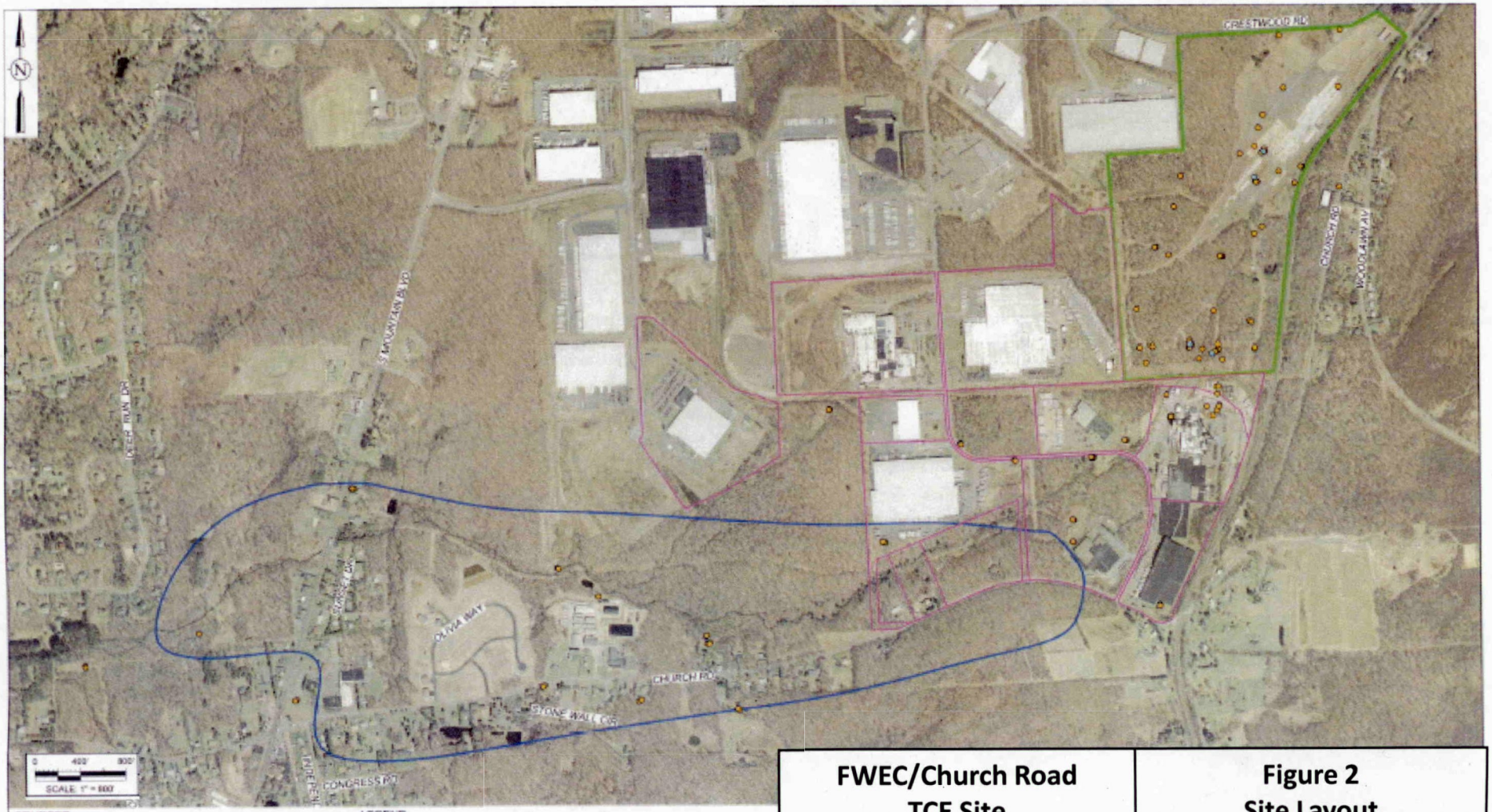
2.7 Ecological Impacts

A citizen asked if the contaminated groundwater has impacted wildlife such as deer and fish, which people may be consuming.

EPA Response: A Baseline Ecological Risk Assessment (BERA) was performed to evaluate any ecological impacts from contamination at the Site. The BERA evaluated results from surface water, sediment, soil, and groundwater samples and concluded that the potential for risk to the aquatic and semi-aquatic biota inhabiting Watering Run and its tributary is negligible and does not warrant further ecological evaluation or remedial action. The BERA also concluded that potential for risk to terrestrial biota is negligible and does not warrant further ecological evaluation or remedial action. However, the potential for risk to macroinvertebrates and amphibians in the FWWTP from the combination of surface water and sediment contamination exceeds acceptable levels and warrants further action. This was the only ecological risk identified at the Site. The Selected Interim Remedial Action includes sediment removal at the FWWTP and is expected to address the unacceptable ecological risks to macroinvertebrates and amphibians in the FWWTP. The BERA is available as part of the Administrative Record file for the Site.

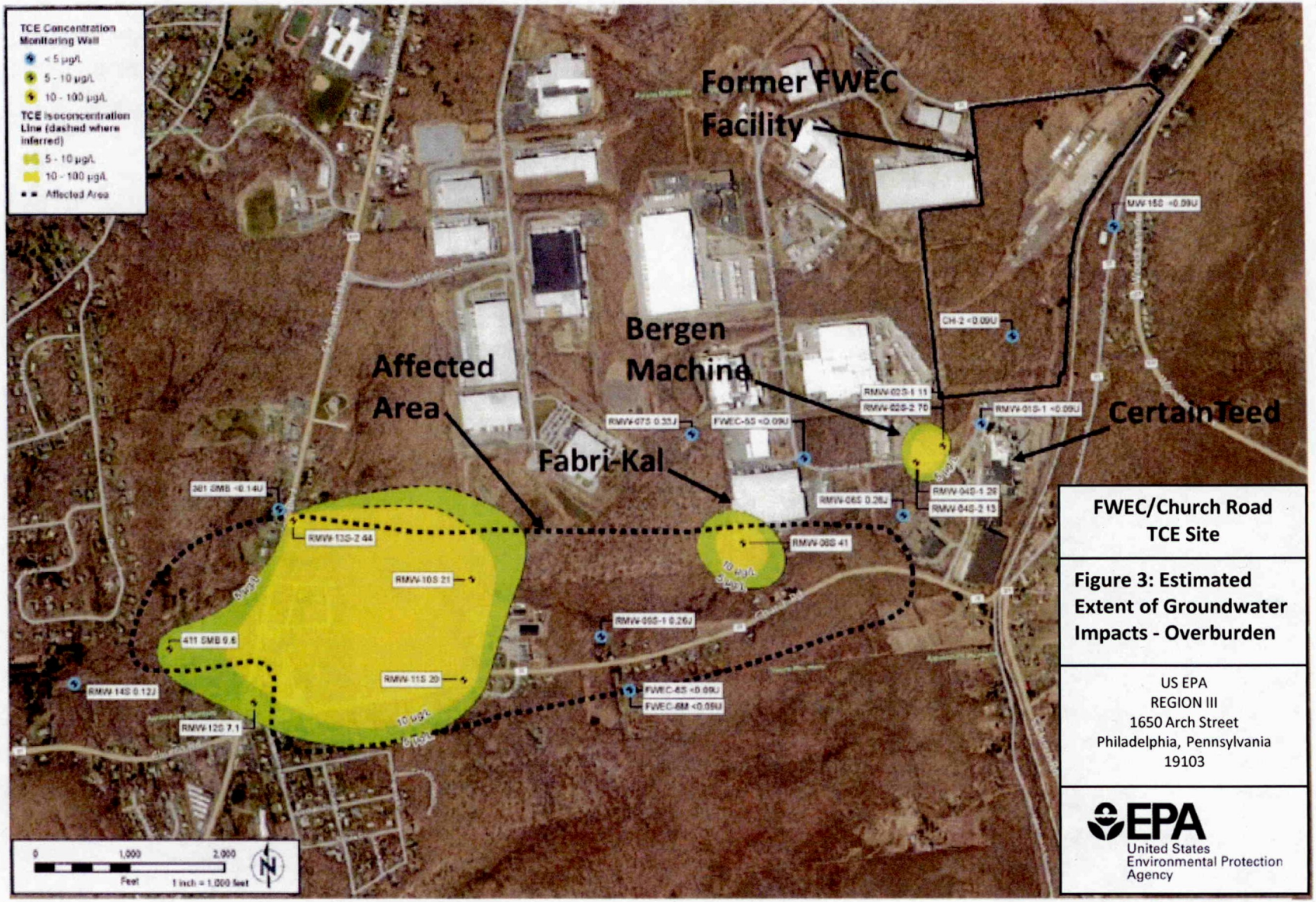
Figures


SURROUNDING INDUSTRIAL PROPERTY
FORMER FWEC FACILITY
AFFECTED AREA
W R I G H T
Wech Corners
SITE VICINITY
SOURCE
ESRI USA TOPO MAPS.
LEGEND
AFFECTED AREA
FORMER FWEC FACILITY (APPROXIMATE BOUNDARY)
SURROUNDING INDUSTRIAL PROPERTIES (APPROXIMATE BOUNDARIES)
Adapted from FWEC FS Figure 1
FWEC/Church Road TCE Site
Figure 1
Site Location Map
US EPA
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103
EPA
United States Environmental Protection Agency



Adapted from FWEC FS Figure 2

FWEC/Church Road TCE Site	Figure 2 Site Layout
US EPA REGION III 1650 Arch Street Philadelphia, Pennsylvania 19103	EPA United States Environmental Protection Agency



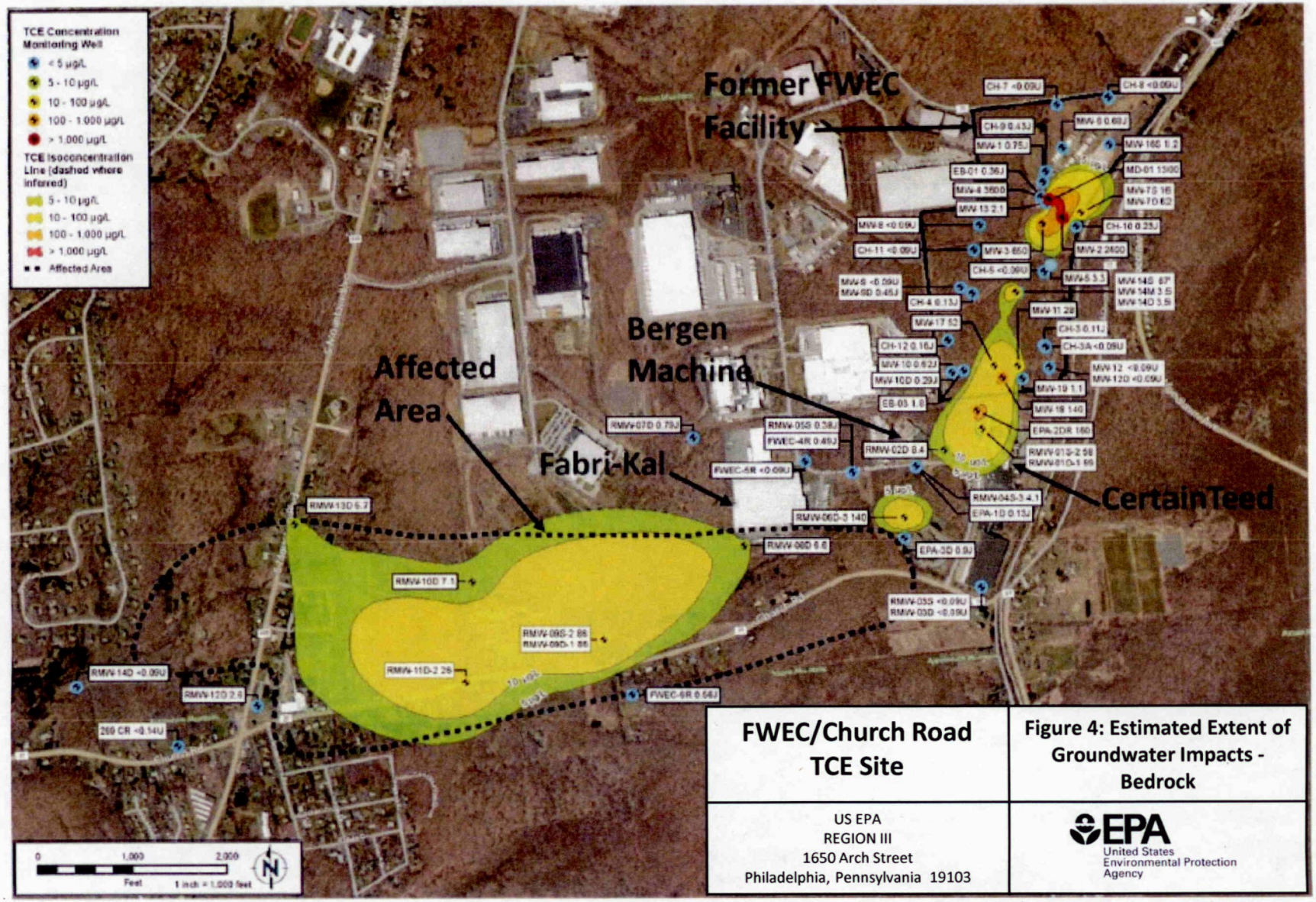
FWEC/Church Road TCE Site

Figure 3: Estimated Extent of Groundwater Impacts - Overburden

US EPA
REGION III
1650 Arch Street
Philadelphia, Pennsylvania
19103

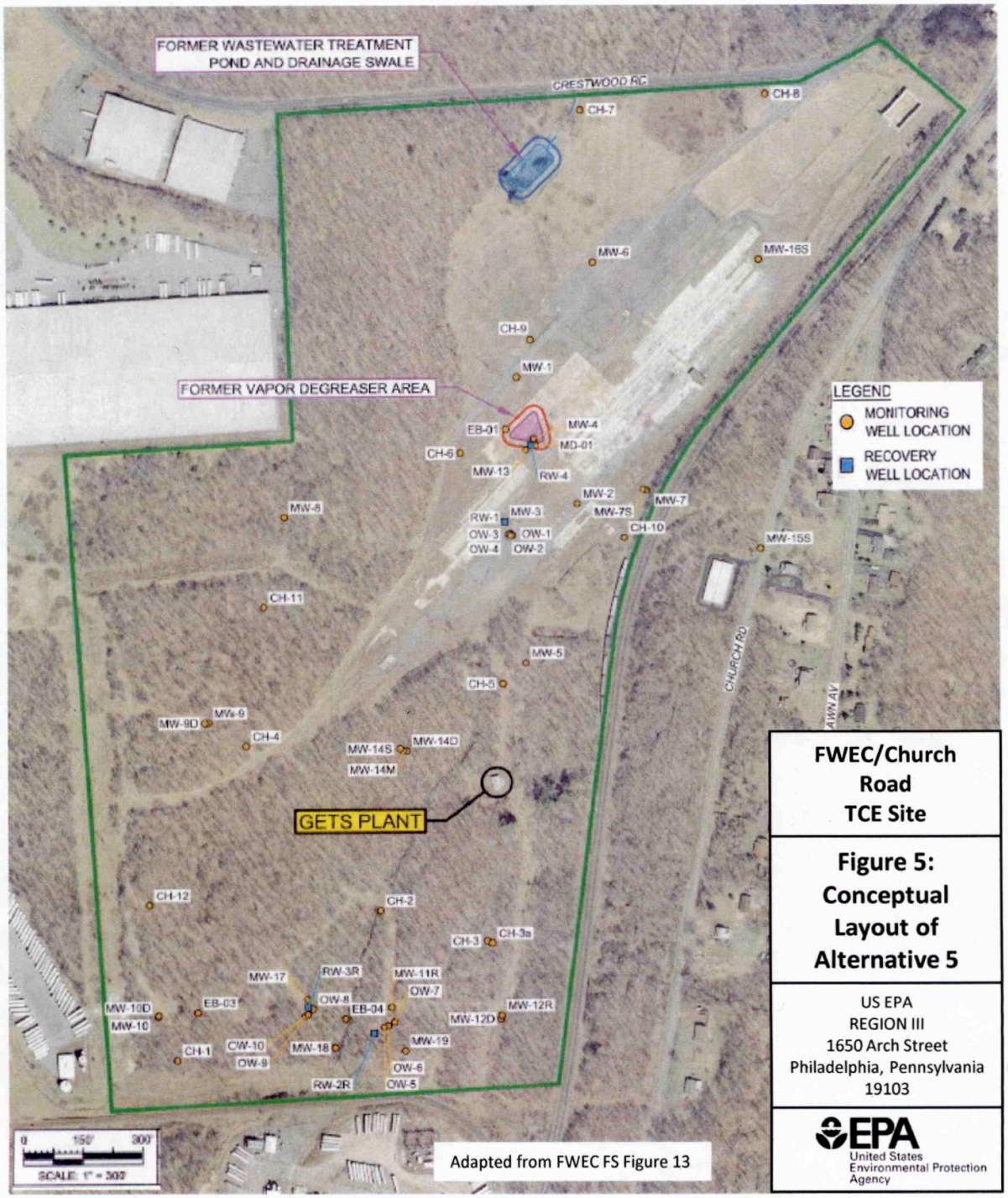
EPA United States Environmental Protection Agency

Adapted from FWEC FS Figure 8



FWEC/Church Road TCE Site	Figure 4: Estimated Extent of Groundwater Impacts - Bedrock
US EPA REGION III 1650 Arch Street Philadelphia, Pennsylvania 19103	EPA United States Environmental Protection Agency

Adapted from FWEC FS Figure 9


FORMER WASTEWATER TREATMENT POND AND DRAINAGE SWALE
FORMER VAPOR DEGREASER AREA
CRESTWOOD RD
CHURCH RD
GETS PLANT
LEGEND
MONITORING WELL LOCATION
RECOVERY WELL LOCATION
CH-8
CH-7
MW-6
MW-16S
CH-9
MW-1
EB-01
MW-4
MD-01
CH-6
MW-13
RW-4
MW-2
MW-7
MW-8
RW-1
MW-3
MW-7S
CH-10
OW-3
OW-1
OW-4
OW-2
MW-15S
CH-11
MW-5
CH-5
MW-9D
MW-9
CH-4
MW-14S
MW-14D
MW-14M
CH-12
CH-2
CH-3
CH-3a
MW-17
RW-3R
MW-11R
OW-8
OW-7
MW-10D
EB-03
EB-04
MW-12R
MW-10
MW-12D
CW-10
MW-18
MW-19
CH-1
OW-9
OW-6
RW-2R
OW-5
0
150'
300'
SCALE: 1" = 300'
Adapted from FWEC FS Figure 13
FWEC/Church Road TCE Site
Figure 5: Conceptual Layout of Alternative 5
US EPA
REGION III
1650 Arch Street
Philadelphia, Pennsylvania
19103
EPA
United States
Environmental Protection
Agency

Tables

Table 1: Human Health Contaminants of Concern (COCs)
FWEC/Church Road TCE Site

Exposure Point	Compound of Concern [a]	Pathway	Units	EPC [c]	Preliminary Remediation Goal [b]		Preliminary Remediation Goal [b]			Potential ARAR/TBC	Selected Remediation Level	Basis
					HI = 0.1	HI = 1	1.E-06	1.E-05	1.E-04			
Soil										**PADEP MSC (ARAR)**		
Former FWEC Facility Soil - Former Vapor Degreaser Area	1,1,2-Trichloroethane	Residential Direct Contact	mg/kg	2.94E+00	2.0E-01	2.0E+00	1.5E+00	1.5E+01	1.5E+02	NA (d)	NA	PADEP MSC
	Trichloroethene	Residential Direct Contact	mg/kg	4.10E+02	5.2E-01	5.2E+00	2.8E-01	2.8E+00	2.8E+01	5.0E-01	5.0E-01	PADEP MSC
	Trichloroethene	Commercial Direct Contact	mg/kg	4.10E+02	2.4E+00	2.4E+01	8.1E+00	8.1E+01	8.1E+02	5.0E-01	5.0E-01	PADEP MSC
	Trichloroethene	Construction/Utility Worker Direct Contact	mg/kg	4.10E+02	2.2E+00	2.2E+01	1.5E+02	1.5E+03	1.5E+04	5.0E-01	5.0E-01	PADEP MSC
Groundwater										**MCL (ARAR)**		
Former FWEC	Trichloroethene	Residential Tap Water	mg/L	7.46E-01	**8.8E-04**	8.8E-03	**1.0E-03**	1.0E-02	1.0E-01	5.0E-03	5.0E-03	MCL
	Trichloroethene	Commercial Tap Water	mg/L	7.46E-01	1.4E-02	1.4E-01	6.6E-03	6.6E-02	6.6E-01	5.0E-03	5.0E-03	MCL
	Trichloroethene	Future Construction in a Trench	mg/L	7.46E-01	2.7E-03	2.7E-02	2.3E-01	2.3E+00	2.3E+01	5.0E-03	5.0E-03	MCL
Affected Area	Trichloroethene	Residential Tap Water	mg/L	3.01E-02	**6.5E-04**	6.5E-03	**8.1E-04**	8.1E-03	8.1E-02	5.0E-03	5.0E-03	MCL
Surrounding Industrial Properties	Trichloroethene	Residential Tap Water	mg/L	5.95E-02	**6.5E-04**	6.5E-03	**8.2E-04**	8.2E-03	8.2E-02	5.0E-03	5.0E-03	MCL
	Trichloroethene	Future Construction in a Trench	mg/L	5.95E-02	**2.8E-03**	2.8E-02	2.4E-01	2.4E+00	2.4E+01	5.0E-03	5.0E-03	MCL
Vapor Intrusion - Indoor Air PRGs as Calculated from Groundwater - Remediation Levels are selected for subslab soil vapor only										**VISL (Indoor Air) (TBC)**		
Former FWEC Facility Indoor Air PRG Calcs	1,1,1-Trichloroethane	Residential VI	mg/m3	4.21E+01	5.2E-01	5.2E+00	--	--	--	5.2E+00	NA	
	1,1,1-Trichloroethane	Commercial VI	mg/m3	4.21E+01	2.2E+00	2.2E+01	--	--	--	2.2E+01	NA	
	1,1,2-Trichloroethane	Residential VI	mg/m3	3.93E-02	2.1E-05	2.1E-04	1.8E-04	1.8E-03	1.8E-02	1.8E-04	NA	
	1,1,2-Trichloroethane	Commercial VI	mg/m3	3.93E-02	9.7E-05	9.7E-04	7.7E-04	7.7E-03	7.7E-02	7.7E-04	NA	
	1,1-Dichloroethane	Residential VI	mg/m3	2.88E+00	--	--	1.7E-03	1.7E-02	1.7E-01	1.8E-03	NA	
	1,1-Dichloroethane	Commercial VI	mg/m3	2.88E+00	--	--	7.6E-03	7.6E-02	7.6E-01	7.7E-03	NA	
	1,1-Dichloroethene	Residential VI	mg/m3	6.19E+00	2.1E-02	2.1E-01	--	--	--	2.1E-01	NA	
	1,1-Dichloroethene	Commercial VI	mg/m3	6.19E+00	9.7E-02	9.7E-01	--	--	--	9.8E-01	NA	
	Naphthalene	Residential VI	mg/m3	2.10E-02	3.1E-04	3.1E-03	8.2E-05	8.2E-04	8.2E-03	8.3E-05	NA	
	Naphthalene	Commercial VI	mg/m3	2.10E-02	1.3E-03	1.3E-02	3.6E-04	3.6E-03	3.6E-02	3.6E-04	NA	
	Tetrachloroethene	Residential VI	mg/m3	6.41E-02	4.3E-03	4.3E-02	1.1E-02	1.1E-01	1.1E+00	1.1E-02	NA	
	Trichloroethene	Residential VI	mg/m3	6.64E-02	2.1E-04	2.1E-03	1.0E-04	1.0E-03	1.0E-02	4.8E-04	NA	
	Trichloroethene	Commercial VI	mg/m3	6.64E-02	9.7E-04	9.7E-03	3.0E-03	3.0E-02	3.0E-01	3.0E-03	NA	
	Xylenes, Total	Residential VI	mg/m3	2.97E-01	1.1E-02	1.1E-01	--	--	--	1.0E-01	NA	
Vapor Intrusion - Subslab ARARs/TBCs protective of Indoor Air										**VISL (Subslab Soil Vapor) (TBC)**		
Former FWEC Facility Subslab ARAR/TBC Selection	1,1,1-Trichloroethane	Residential VI	mg/m3		--	--	--	--	--	1.7E+02	1.7E+02	VISL (Resi)
	1,1,1-Trichloroethane	Commercial VI	mg/m3		--	--	--	--	--	7.3E+02	7.3E+02	VISL (Com)
	1,1,2-Trichloroethane	Residential VI	mg/m3		--	--	--	--	--	5.8E-03	5.8E-03	VISL (Resi)
	1,1,2-Trichloroethane	Commercial VI	mg/m3		--	--	--	--	--	2.6E-02	2.6E-02	VISL (Com)
	1,1-Dichloroethane	Residential VI	mg/m3		--	--	--	--	--	5.8E-02	5.8E-02	VISL (Resi)
	1,1-Dichloroethane	Commercial VI	mg/m3		--	--	--	--	--	2.6E-01	2.6E-01	VISL (Com)
	1,1-Dichloroethene	Residential VI	mg/m3		--	--	--	--	--	7.0E+00	7.0E+00	VISL (Resi)
	1,1-Dichloroethene	Commercial VI	mg/m3		--	--	--	--	--	2.9E+01	2.9E+01	VISL (Com)
	Naphthalene	Residential VI	mg/m3		--	--	--	--	--	2.8E-03	2.8E-03	VISL (Resi)
	Naphthalene	Commercial VI	mg/m3		--	--	--	--	--	1.2E-02	1.2E-02	VISL (Com)
	Tetrachloroethene	Residential VI	mg/m3		--	--	--	--	--	3.6E-01	3.6E-01	VISL (Resi)
	Trichloroethene	Residential VI	mg/m3		--	--	--	--	--	1.6E-02	1.6E-02	VISL (Resi)
	Trichloroethene	Commercial VI	mg/m3		--	--	--	--	--	1.0E-01	1.0E-01	VISL (Com)
	Xylenes, Total	Residential VI	mg/m3		--	--	--	--	--	3.5E+00	3.5E+00	VISL (Resi)

Notes:

-- No PRG calculated

ARAR/TBC - Applicable or Relevant and Appropriate Requirements/To Be Considered.

EPC - Exposure Point Concentration.

MCL - Maximum Contamination Level (USEPA, 2017a)

NA - Not applicable.

PADEP - The State of Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentration (MSC), Table 3b - Soil to Groundwater Numeric Values.
Land Recycling Program 25 Pa Code, Chapter 250 Subchapter C, Pennsylvania Department of Environmental Protection (PADEP) Statewide Health Standards, sets forth concentrations of regulated substances with a specific environmental medium, designated as Medium Specific Concentrations (MSCs) (ARAR).

PRG - Preliminary Remediation Goal

VISL - Vapor Intrusion Screening Level Calculator Version 3.5 for Residential and Commercial Use (June, 2017) Target hazard index of 1 and target cancer risk of $1x10^{-6}$ (USEPA, 2017b).

(a) COCs have been selected as per Table 1.

(b) PRGs have been calculated as per Table 2.

(c) EPCs are documented in the BHHRA. Groundwater concentrations shown for the groundwater to indoor air pathway are the maximum detected concentrations used for COPC selection.

(d) TCE is the primary risk driver in soil for which risk exceeds 1x10-4 and HI equal or greater to 1; therefore RGs were not selected for other co-located compounds such as 1,1-TCA because remediation of TCE in soil would address these related compounds that are present at low concentrations and do not pose significant risk on their own.

Table 2:
Contaminants of Potential Ecological of Concern (COPECs)
FWWTP – Surface Water
FWEC/Church Road TCE Site

Exposure Point	Chemical *	Minimum Concentration	Maximum Detected Concentration	Location of Maximum Detected Concentration	Detection Frequency	Concentration Used for Screening	Notes (a)	Ecological Screening Level (b)	Reference (b)	Hazard Quotient (HQ) (c)	Maximum Detected Background Concentration	COPEC Flag (Y/N)	Rationale for Selection or Deletion (d)
Former Waste Water Treatment Pond	Acetone	2.5U	12	SW-04/2017	2/6	12	MAX	1,500	1	0.0080	3.9J	N	BSL
	Methylene chloride	1.0U	0.54J	SW-04/2017	1/2	0.54	MAX	98.1	1	0.0055	0.56J	N	BSL, BBL
	Toluene	0.54J	2.9	SW-01/2017	2/2	2.9	MAX	2.0	1	**1.5**	ND	**Y**	**ASL, ABL**
	Benzo(b)fluoranthene	1.0U	0.93J	SW-01/2017	1/2	0.93	MAX	2.6	2	0.36	ND	N	BSL
	Butylbenzylphthalate	10U	0.68J	SW02(DUP)/2011	8/10	0.68	MAX	16	1	0.043	ND	N	BSL
	Di-n-butylphthalate	0.13U	0.15J	SW02(DUP)/2011	1/6	0.15	MAX	19	1	0.0079	ND	N	BSL
	Fluoranthene	0.018U	0.055J	SW01/2011	3/10	0.055	MAX	0.040	1	**1.4**	ND	**Y**	**ASL, ABL**
	Phenanthrene	0.042U	0.061J	SW01/2011	2/6	0.061	MAX	0.40	1	0.15	ND	N	BSL
	Pyrene	0.016U	0.038J	SW02/2011	4/10	0.038	MAX	0.025	1	**1.5**	ND	**Y**	**ASL, ABL**
	Delta-BHC	0.018U	0.041J	SW01/2011	2/6	0.041	MAX	141	1	0.00029	ND	N	BSL
	Endosulfan I	0.02U	0.10	SW02&SW03/2011	3/6	0.10	MAX	0.051	1	**2.0**	ND	**Y**	**ASL, ABL**
	Aluminum	200 U	555	SW-01/2017	18/20	555	MAX	87	1	6.4	975	N	BBL
	Antimony	1.3U	1.6B	SW02/2011	3/12	1.6	MAX	30	1	0.053	ND	N	BSL
	Barium	10J	37.8J	SW-01/2017	20/20	37.8	MAX	4.0	1	**9.5**	37	**Y**	**ASL, ABL**
	Beryllium	0.23U	0.37B	SW03/2011	11/16	0.37	MAX	0.66	1	0.56	ND	N	BSL
	Cobalt	0.40U	0.70B	SW02(DUP)/2011	3/20	0.70	MAX	23	1	0.030	ND	N	BSL
	Copper	2.7U	8.7J	SW-01/2017	11/20	8.7	MAX	4.9	2	1.8	14.9J	N	BBL
	Lead	1.3U	6.8J	SW-01/2017	6/16	6.8	MAX	1.3	2	**5.2**	ND	**Y**	**ASL, ABL**
	Manganese	1.4J	454J	SW-01/2017	20/20	454	MAX	120	1	**3.8**	57J	**Y**	**ASL, ABL**
	Nickel	1.6U	7.6J	SW01/2011	3/16	7.6	MAX	29	2	0.26	ND	N	BSL
	Silver	0.68U	1.3B	SW02(DUP)/2011	2/8	1.3	MAX	0.23	1	**5.7**	ND	**Y**	**ASL, ABL**
	Thallium	2.4U	3.7B	SW02/2011	2/16	3.7	MAX	0.80	1	**4.6**	ND	**Y**	**ASL, ABL**
	Zinc	9.6J	127	SW01/2011	20/20	127	MAX	67	2	**1.9**	61.7	**Y**	**ASL, ABL**

Notes:
All concentrations in micrograms per liter (µg/L).
COPEC = Contaminant of Potential Ecological Concern.
ND = Not detected.

* = Calcium, iron, magnesium, and sodium were not included as they are considered to be essential nutrients.

Qualifiers:
J - The concentration is an estimated value.
U - The compound was not detected at the indicated concentration limit.
B - Reported value may be wholly or partially due to contamination in an associated blank sample.

Bold = Constiuent determined to be a COPEC in surface water

a MAX = Maximum detected concentration.
b 1 - United States Environmental Protection Agency (USEPA) Region III Biological Technical Assisstance Group (BTAG) Freshwater Screening Benchmarks (USEPA, 2006).
2 - USEPA Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft. Freshwater Screening Values used from the Surface Water Screening Values for Hazardous Waste Sites table (USEPA, 2015).
c Hazard quotient calculated by dividing the concentration used for screening by the ecological screening level.
d BSL = Below Screening Level
BBL = Below Background Level
ASL = Above Screening Level
ABL = Above Background Level

Table 3: Contaminants of Potential Ecological of Concern (COPECs)
FWWTP – Sediment
FWEC/Church Road TCE Site

Exposure Point	Compound of Concern [a]	Pathway	Units	EPC [c]	Preliminary Remediation Goal [b]		Preliminary Remediation Goal [b]			Potential ARAR/TBC	Selected Remediation Level	Basis
					HI = 0.1	HI = 1	1.E-06	1.E-05	1.E-04			
Soil										**PADEP MSC (ARAR)**		
Former FWEC Facility Soil - Former Vapor Degreaser Area	1,1,2-Trichloroethane	Residential Direct Contact	mg/kg	2.94E+00	2.0E-01	2.0E+00	1.5E+00	1.5E+01	1.5E+02	NA (d)	NA	PADEP MSC
	Trichloroethene	Residential Direct Contact	mg/kg	4.10E+02	5.2E-01	5.2E+00	2.6E-01	2.6E+00	2.6E+01	5.0E-01	5.0E-01	PADEP MSC
	Trichloroethene	Commercial Direct Contact	mg/kg	4.10E+02	2.4E+00	2.4E+01	8.1E+00	8.1E+01	8.1E+02	5.0E-01	5.0E-01	PADEP MSC
	Trichloroethene	Construction/Utility Worker Direct Contact	mg/kg	4.10E+02	2.2E+00	2.2E+01	1.5E+02	1.5E+03	1.5E+04	5.0E-01	5.0E-01	PADEP MSC
Groundwater										**MCL (ARAR)**		
Former FWEC	Trichloroethene	Residential Tap Water	mg/L	7.46E-01	8.8E-04	8.8E-03	1.0E-03	1.0E-02	1.0E-01	5.0E-03	5.0E-03	MCL
	Trichloroethene	Commercial Tap Water	mg/L	7.46E-01	1.4E-02	1.4E-01	6.8E-03	6.8E-02	6.8E-01	5.0E-03	5.0E-03	MCL
	Trichloroethene	Future Construction In a Trench	mg/L	7.46E-01	2.7E-03	2.7E-02	2.3E-01	2.3E+00	2.3E+01	5.0E-03	5.0E-03	MCL
Affected Area	Trichloroethene	Residential Tap Water	mg/L	3.01E-02	6.5E-04	6.5E-03	8.1E-04	8.1E-03	8.1E-02	5.0E-03	5.0E-03	MCL
Surrounding Industrial Properties	Trichloroethene	Residential Tap Water	mg/L	5.95E-02	6.5E-04	6.5E-03	8.2E-04	8.2E-03	8.2E-02	5.0E-03	5.0E-03	MCL
	Trichloroethene	Future Construction In a Trench	mg/L	5.95E-02	2.6E-03	2.6E-02	2.4E-01	2.4E+00	2.4E+01	5.0E-03	5.0E-03	MCL
Vapor Intrusion - Indoor Air PRGs as Calculated from Groundwater - Remediation Levels are selected for subslab soil vapor only										**VISL (Indoor Air) (TBC)**		
Former FWEC Facility Indoor Air PRG Calcs	1,1,1-Trichloroethane	Residential VI	mg/m3	4.21E+01	5.2E-01	5.2E+00	--	--	--	5.2E+00	NA	
	1,1,1-Trichloroethane	Commercial VI	mg/m3	4.21E+01	2.2E+00	2.2E+01	--	--	--	2.2E+01	NA	
	1,1,2-Trichloroethane	Residential VI	mg/m3	3.93E-02	2.1E-05	2.1E-04	1.8E-04	1.8E-03	1.8E-02	1.8E-04	NA	
	1,1,2-Trichloroethane	Commercial VI	mg/m3	3.93E-02	8.7E-05	8.7E-04	7.7E-04	7.7E-03	7.7E-02	7.7E-04	NA	
	1,1-Dichloroethane	Residential VI	mg/m3	2.88E+00	–	–	1.7E-03	1.7E-02	1.7E-01	1.8E-03	NA	
	1,1-Dichloroethane	Commercial VI	mg/m3	2.88E+00	–	–	7.6E-03	7.6E-02	7.6E-01	7.7E-03	NA	
	1,1-Dichloroethene	Residential VI	mg/m3	6.19E+00	2.1E-02	2.1E-01	--	--	--	2.1E-01	NA	
	1,1-Dichloroethene	Commercial VI	mg/m3	6.19E+00	8.7E-02	8.7E-01	--	--	--	8.6E-01	NA	
	Naphthalene	Residential VI	mg/m3	2.10E-02	3.1E-04	3.1E-03	8.2E-05	8.2E-04	8.2E-03	8.3E-05	NA	
	Naphthalene	Commercial VI	mg/m3	2.10E-02	1.3E-03	1.3E-02	3.6E-04	3.6E-03	3.6E-02	3.6E-04	NA	
	Tetrachloroethene	Residential VI	mg/m3	6.41E-02	4.3E-03	4.3E-02	1.1E-02	1.1E-01	1.1E+00	1.1E-02	NA	
	Trichloroethene	Residential VI	mg/m3	6.64E-02	2.1E-04	2.1E-03	1.0E-04	1.0E-03	1.0E-02	4.8E-04	NA	
	Trichloroethene	Commercial VI	mg/m3	6.64E-02	8.7E-04	8.7E-03	3.0E-03	3.0E-02	3.0E-01	3.0E-03	NA	
	Xylenes, Total	Residential VI	mg/m3	2.97E-01	1.1E-02	1.1E-01	--	--	--	1.0E-01	NA	
Vapor Intrusion - Subslab ARARs/TBCs protective of Indoor Air										**VISL (Subslab Soil Vapor) (TBC)**		
Former FWEC Facility Subslab ARAR/TBC Selection	1,1,1-Trichloroethane	Residential VI	mg/m3		–	–	--	--	--	1.7E+02	1.7E+02	VISL (Resi)
	1,1,1-Trichloroethane	Commercial VI	mg/m3		–	–	--	--	--	7.3E+02	7.3E+02	VISL (Com)
	1,1,2-Trichloroethane	Residential VI	mg/m3		–	–	--	--	--	5.8E-03	5.8E-03	VISL (Resi)
	1,1,2-Trichloroethane	Commercial VI	mg/m3		–	–	--	--	--	2.6E-02	2.6E-02	VISL (Com)
	1,1-Dichloroethane	Residential VI	mg/m3		–	–	--	--	--	5.8E-02	5.8E-02	VISL (Resi)
	1,1-Dichloroethane	Commercial VI	mg/m3		–	–	--	--	--	2.6E-01	2.6E-01	VISL (Com)
	1,1-Dichloroethene	Residential VI	mg/m3		–	–	--	--	--	7.0E+00	7.0E+00	VISL (Resi)
	1,1-Dichloroethene	Commercial VI	mg/m3		–	–	--	--	--	2.9E+01	2.9E+01	VISL (Com)
	Naphthalene	Residential VI	mg/m3		–	–	--	--	--	2.8E-03	2.8E-03	VISL (Resi)
	Naphthalene	Commercial VI	mg/m3		–	–	--	--	--	1.2E-02	1.2E-02	VISL (Com)
	Tetrachloroethene	Residential VI	mg/m3		–	–	--	--	--	3.6E-01	3.6E-01	VISL (Resi)
	Trichloroethene	Residential VI	mg/m3		–	–	--	--	--	1.6E-02	1.6E-02	VISL (Resi)
	Trichloroethene	Commercial VI	mg/m3		–	–	--	--	--	1.0E-01	1.0E-01	VISL (Com)
	Xylenes, Total	Residential VI	mg/m3		–	–	--	--	--	3.5E+00	3.5E+00	VISL (Resi)

Notes:

– No PRG calculated

ARAR/TBC - Applicable or Relevant and Appropriate Requirements/To Be Considered.

EPC - Exposure Point Concentration.

MCL - Maximum Contamination Level (USEPA, 2017a)

NA - Not applicable.

PADEP - The State of Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentration (MSC), Table 3b - Soil to Groundwater Numeric Values.
Land Recycling Program 25 Pa Code, Chapter 250 Subchapter C, Pennsylvania Department of Environmental Protection (PADEP) Statewide Health Standards, sets forth concentrations of regulated substances with a specific environmental medium, designated as Medium Specific Concentrations (MSCs) (ARAR).

PRG - Preliminary Remediation Goal

VISL - Vapor Intrusion Screening Level Calculator Version 3.5 for Residential and Commercial Use (June, 2017) Target hazard index of 1 and target cancer risk of $1x10^{-6}$ (USEPA, 2017b).

(a) COCs have been selected as per Table 1.

(b) PRGs have been calculated as per Table 2.

(c) EPCs are documented in the BHHRA. Groundwater concentrations shown for the groundwater to indoor air pathway are the maximum detected concentrations used for COPC selection.

(d) TCE is the primary risk driver in soil for which risk exceeds 1x10-4 and HI equal or greater to 1; therefore RGs were not selected for other co-located compounds such as 1,1-TCA because remediation of TCE in soil would address these related compounds that are present at low concentrations and do not pose significant risk on their own.

Prepared by: ARQ 11/28/17
Checked by: KALS 11/28/2017

Table 4: Sediment Cleanup Levels FWWTP
FWEC/Church Rd TCE Site

Chemical	Concentration Used for Screening	Ecological Screening Levels (NOAEL)[1]	Hazard Quotient (HQ)	TEC[4]	PEC[5]	Ref	Cleanup Level (mg/kg)	Background (Maximum Detected)
Cadmium	5.8	0.99	5.9	0.99	4.98	2	2.22	ND
Silver	170	1.0	170.0	1.0	2.2	3	1.48	ND
Zinc	1020	121.0	8.4	121.0	459.0	2	235.67	110
Total PAHs[6]	1672	NA	NA	1.61	22.8	2	6.06	NA

ENDNOTES

[1]United States Environmental Protection Agency (USEPA) Region III
Biological Technical Assistance Group (BTAG) Freshwater Sediment Screening Benchmarks. 2006.

[2]MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology 39:20-31.

[3]MacDonald, D.D., C.G. Ingersoll, D.E. Smrong, R.A. Lindskoog, G. Sloane, T. Biernacki. 2003.
Development and evaluation of numerical sediment quality assessment guidelines
for Florida inland waters. Florida Department of Environmental Protection.
http://www.dep.state.fl.us/water/monitoring/docs/seds/SQAGs_for_Florida_Inland_Waters_01_03.PDF

[4]TEC – Threshold Effects Concentration

[5]PEC – Probable Effects Concentration

[6]Screening Level Risk Assessment provided screening values for individual PAHs.

NOTES

All concentrations in milligrams per kilogram (mg/kg).
Cleanup level is the GeoMean of TEC and PEC.
Total PAHs are the sum of low and high molecular weight PAHs that were retained as COCs.

Table 5
Applicable or Relevant and Appropriate Requirements
Foster Wheeler Energy Corporation/Church Road TCE Superfund Site, Mountain Top, PA

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Interim Remedy
Chemical Specific ARARs				
Pennsylvania Water Quality Standards	25 Pa. Code §§ 93.7(a) and (b), 93.8c(a)	Relevant and Appropriate	These are specific water quality criteria established pursuant to Section 304 of the Clean Water Act (CWA). These provisions set the concentrations of pollutants that are allowable at levels that preserve human health based on water and fish ingestion and to preserve aquatic life. Ambient water quality criteria may be relevant and appropriate to the CERCLA cleanups based on uses of a water body.	The discharge of treated groundwater will be required to meet the criteria established for protection of human health and aquatic life.
Safe Drinking Water Act Maximum Contaminant Levels (MCLs)	40 CFR §141.61(a)(5)	Relevant and Appropriate	Under the Federal Safe Drinking Water Act, MCLs are enforceable standards for public drinking water supply systems that have at least 15 service connections or are used by at least 25 persons. MCLs are relevant and appropriate requirements for groundwater cleanup.	Groundwater at the Site is a potential future source of drinking water; therefore, the drinking water MCLs for contaminants of concem (COCs) must be met in the groundwater plume. Because this proposed interim remedy only addresses groundwater at the former FWEC Facility, this requirement is being waived for the remainder of the Site pursuant to the interim action waiver set forth in Section l2l(d)(4)(A) of CERCLA and 40 C.F.R. § 430(f)(l)(ii)(C)(l).

Table 5
Applicable or Relevant and Appropriate Requirements
Foster Wheeler Energy Corporation/Church Road TCE Superfund Site, Mountain Top, PA

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Interim Remedy
Location-Specific ARARs				
Susquehanna River Basin Commision	18 C.F.R. 807.1	Applicable	Requires registration if withdrawing more than 10,000 gallons of groundwater per day for any consecutive 30 day period in the Susquehana River Basin.	Extraction of groundwater for treatment will meet the substantive requirements of these regulations.
Compensatory Mitigation for Loss of Aquatic Resources	40 C.F.R. § 230.93	Relevant and Appropriate	Describes the standards and criteria for establishing compensatory mitigation of wetlands	Minor disruption to potential wetlands may occur during excavation of contaminated sediment
Dam Safety and Waterway Management	Substantive requirements of 25 Pa. Code §§105.18a and 105.20a	Relevant and Appropriate	Establishes criteria for placing structures and conducting activities in wetlands	Minor disruption to potential wetlands may occur during excavation of contaminated sediment
Action-Specific ARARs				
A. Water				
Pennsylvania Water Quality Toxics Management Strategy	25 Pa. Code §§ 16.24, 16.32 – 16.33, and 16.51 25 Pa. Code § 16 Appendix A Table 2B	Applicable	These regulations provide standards and criteria for protection of human health and aquatic life in waters of the Commonwealth.	The groundwater treatment system will comply with the substantive requirements of these discharge standards.
National Pollutant Discharge Elimination System Requirements	40 C.F.R. § 122.44(a)(1), (b)(1)(first sentence), (d), (e), (i)(1), and (k); 122.45(a), (c)-(f)	Relevant and Appropriate	The substantive requirements provided by these regulations establish effluent limitations for discharges to waters of the United States.	The groundwater treatment system will comply with the substantive requirements of these provisions.
Pennsylvania National Pollutant Discharge Elimination System Requirements	25 Pa. Code §§ 92a.12(a), 92a.41(a)(4) and (5), 92a.41(c), 92a.61(d), (e), and (i)	Relevant and Appropriate	The substantive requirements provided by these regulations that are more stringent than the federal requirements, establish effluent limitations for discharges to waters of Pennsylvania.	The groundwater treatment system will comply with the substantive requirements of these provisions.

Table 5
Applicable or Relevant and Appropriate Requirements
Foster Wheeler Energy Corporation/Church Road TCE Superfund Site, Mountain Top, PA

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Interim Remedy
B. Soil				
Erosion and Sediment Control	25 Pa. Code §§102.4(b)(1), 102.11(a), 102.22	Applicable	Identifies erosion and sediment control requirements and criteria for activities involving land clearing, grading and other earth disturbances and establishes erosion and sediment control criteria.	These regulations apply to construction activities at the Site that disturb the ground surface including clearing grading, excavation, or well installation.
C. Wastes				
Pennsylvania Hazardous Waste Management Regulations Pennsylvania has an EPA authorized hazardous waste program; therefore, the EPA-authorized hazardous waste regulations for the Commonwealth of Pennsylvania are identified here as the applicable federal hazardous waste standard.	25 PA Code § 264a.1 (incorporating by reference 40 C.F.R. Part 264, but limited to the substantive portions of Section 264.171-.175, .179)	Relevant and Appropriate	These provisions govern the management of containers.	These requirements must be followed for any groundwater treatment remedy that generates and stores hazardous waste.
	25 PA Code § 264a.1 (incorporating by reference 40 C.F.R. Part 264, but limited to the substantive portions of Section 264.228(a)(2)(iii))	To Be Considered	These provisions provide performance standards for final cover and grading of caps.	These provisions will be considered in any remedy requiring a cap over contaminated soils or sediments.
Pennsylvania operating requirements for municipal waste landfills.	25 PA Code § 273.234(a)(1)(i)	To Be Considered	These provisions provide performance standards for final cover and grading of caps.	These provisions will be considered in any remedy requiring a cap over contaminated soils or sediments.
D. Air				

Table 5
Applicable or Relevant and Appropriate Requirements
Foster Wheeler Energy Corporation/Church Road TCE Superfund Site, Mountain Top, PA

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Interim Remedy
Fugitive Air Emissions	40 C.F.R. § 50.6 – 50.7 25 Pa Code §§ 123.1(a) and (c), 123.2, 123.31, 123.41	Applicable	Establishes the fugitive dust regulation for particulate matter.	Any construction and/or excavation activities will comply with the substantive requirements of these regulations.
Federal – Control of Air Emissions from Air Strippers at Superfund Groundwater Sites	OSWER Directive 9355.0-28, June 15, 1989	To Be Considered	This policy guides the requirement for additional controls on air strippers at Superfund Sites.	To be considered regarding air emissions from existing GETS.

Table 6: Summary of Remedial Alternative Costs
FWEC/Church Road TCE Site

Remedial Alternative	Total Project Duration (Years)	Capital Cost (Base Year Cost)	Annual NPV O&M Cost	*Total NPV Cost
Alternative 1 No Action	0	$0	$0	$0
Alternative 2 Operation & Maintenance of Existing Mitigation Systems	30	$424,000	$4,345,000	$4,769,000
Alternative 3 Capping & GETS Optimization	30	$842,000	$3,876,000	$4,718,000
Alternative 4 Excavation & GETS Optimization	30	$1,635,000	$3,047,000	$4,682,000
Alternative 5 Capping, Source Area Treatment & GETS Optimization	30	$1,218,000	$2,932,000	$4,150,000

**Total present worth costs for each alternative calculated using an annual discount factor of 7% (EPA 1988, 2000)*

GETS = groundwater extraction and treatment system O&M = operations & maintenance NPV = net present value

Appendix A

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

August 28, 2018

Mr. Will Geiger (3HS21)
Remedial Project Manager
Environmental Protection Agency Region III
1650 Arch Street
Philadelphia, PA 19103

Re: Record of Decision (ROD) for Interim Remedial Action
Foster Wheeler Energy Corporation/Church Road TCE Superfund Site
Mountain Top, Wright Township, Luzerne County, Pennsylvania

Dear Mr. Geiger:

The Pennsylvania Department of Environmental Protection (DEP)has received and reviewed the Record of Decision (ROD) for Interim Remedial Action for the Foster Wheeler/Church Road TCE Site in Mountain Top, Wright Township, Luzerne County. This ROD presents EPA's Preferred Interim Remedial Action to address contaminated sediment, soil, and groundwater at the former FWEC Facility and Site-wide vapor intrusion. The Affected Area and Surrounding Industrial Properties will be addressed under subsequent actions.

EPA has determined that the Selected Interim Remedy will be the most effective in addressing contaminated sediment, soil, and groundwater at the former FWEC Facility, as well as Site-wide vapor intrusion. The selected Alternative includes the following components:

- Continued groundwater extraction and treatment using the existing Groundwater Extraction Treatment System (GETS);
- Optimization of the GETS;
- Capping and Soil Vapor Extraction treatment of Source Area Soils;
- Sediment removal and wetland restoration at the Former Wastewater Treatment Pond;
- Vapor Intrusion monitoring and mitigation;
- Groundwater monitoring;
- Land and groundwater use restrictions.

DEP hereby concurs with EPA's proposed remedy with the following conditions:

- DEP will be given the opportunity to review and comment on documents and concur with decisions related to the design and implementation of the remedial action.
- DEP will have the opportunity to review and comment before any modification to the ROD and the issuance of an Explanation of Significant Difference (ESD).
- EPA will assure that DEP is provided an opportunity to fully participate in any negotiations with responsible parties.

- DEP reserves the right and responsibility to take independent enforcement actions pursuant to state law.

Thank you for the opportunity to comment and concur on this EPA Record of Decision. If you have any questions regarding this matter, please do not hesitate to contact Donald G. Rood, LPG at 570.826.5449 or dorood@pa.gov.

Sincerely,

Michael D. Bedrin

Michael D. Bedrin
Regional Director
Northeast Regional Office

Appendix B

Table B-2. Cost Estimate - Alternative 2 - Operation & Maintenance of Existing Mitigation Systems & Dredge and Backfill FWWTP
Feasibility Study
Church Road TCE Site, Mountain Top, Pennsylvania

DESCRIPTION	QUANTITY	UNIT	UNIT COST	CAPITAL COSTS [1]	NPV O&M COSTS [1,2]
Institutional Controls / Engineering Controls (ICs / ECs)					
ICs					
Evaluate existing deed restrictions/need for amendments or ordinances	1	year	$3,000		$37,200
Conduct Five-Year Reviews, Reporting	1	each	$20,000		$248,200
			subtotal	$0	$285,000
ECs					
Install Fencing & Warning Signage - Impacted Soil/Sediment Areas	1,000	linear feet	$15	$15,000	
Maintain Fencing & Warning Signage - Impacted Soil/Sediment Areas	1	year	$1,500		$18,600
			subtotal	$15,000	$19,000
				$15,000	$304,000
Contingency, QA/QC, procurement, project management	20%			$3,000	$61,000
Total Cost - ICs / ECs				**$18,000**	**$365,000**
Groundwater Extraction & Treatment System O&M					
Replacement of system components after 20 years of operation	1	lump sum	$80,000	$80,000	
Routine O&M, preventive maintenance, system & well sampling, reporting	1	lump sum	$80,000		$993,000
			subtotal	$80,000	$993,000
Contingency, QA/QC, procurement, project management	20%			$16,000	$199,000
Total Cost - Groundwater Extraction Treatment System O&M				**$96,000**	**$1,192,000**
Groundwater Monitoring					
Workplan preparation (Years 1-5)	1	annual	$17,000		$70,000
Groundwater Sampling (Years 1-5)	1	annual	$200,000		$820,000
Data Validation, Reporting (Years 1-5)	1	annual	$43,000		$176,000
Workplan preparation (Years 6-30)	1	annual	$5,000		$58,000
Groundwater Sampling (Years 6-30)	1	annual	$60,000		$699,000
Data Validation, Reporting (Years 6-30)	1	annual	$15,000		$175,000
			subtotal	$0	$1,998,000
Contingency, QA/QC, procurement, project management	20%			$0	$400,000
Total Cost - Groundwater Monitoring				**$0**	**$2,398,000**
FWWTP - Dredging and Backfilling					
Pre-Design and Design Activities					
Engineering design, specifications, and bidding support	1	lump sum	$30,000	$30,000	
Permitting	1	lump sum	$25,000	$25,000	
			subtotal	$55,000	$0
Dredge and Backfill					
Mobilization/Demobilization	1	lump sum	$20,200	$20,000	
Site Prep (Workplans and submittals, grubbing and clearing, erosion controls)	1	lump sum	$22,900	$23,000	
Surveys (Pre-dredge, post-dredge, post cap)	1	lump sum	$10,000	$10,000	
Dredging and Processing	617	cubic yard	$37	$23,000	
Transprotation and Dispsoal	771	ton	$100	$77,200	
Backfill	617	cubic yard	$40.67	$25,000	
Restoration	1	lump sum	$5,200	$5,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$203,000	$0
Long Term Monitoring					
Semi-annual inspection and annual report.	5	annual	$10,000		$41,000
			subtotal	$258,000	$41,000
Contingency, QA/QC, procurement, project management	20%			$52,000	$8,000
Total Cost - Dredging and Backfilling				**$310,000**	**$49,000**
Vapor Intrusion Monitoring & Mitigation					
System Installation (Years 1-5)	1	annual	$10,000		$41,000
Workplan preparation (Years 1-5)	1	annual	$5,000		$21,000
Monitoring (Years 1-5)	1	annual	$10,000		$41,000
Data Validation, Reporting (Years 1-5)	1	annual	$5,000		$21,000
System Installation (Years 6-30)	1	annual	$5,000		$58,000
Workplan preparation (Years 6-30)	1	annual	$2,500		$29,000
Monitoring (Years 6-30)	1	annual	$5,000		$58,000
Data Validation, Reporting (Years 6-30)	1	annual	$1,250		$15,000
			subtotal	$0	$284,000
Contingency, QA/QC, procurement, project management	20%			$0	$57,000
Total Cost - Vapor Intrusion Monitoring & Mitigation				**$0**	**$341,000**
Total Capital & NPV O&M Costs				**$424,000**	**$4,345,000**
TOTAL NET PRESENT VALUE FOR THIS ALTERNATIVE					**$4,769,000**

Assumptions

Number of years of remediation (groundwater monitoring, vapor mitigation)	30
Number of years of remediation (Dredge and Backfill O&M)	5
Real discount rate	7%

Footnotes

(1) Costs were estimated based on a conceptual design of remedial components that could address impacted media at the Site containing concentrations of constituents that exceed Remediation Goals (RGs) identified in this Feasibility Study (FS) Report, the results of the Remedial Investigation (RI) presented in the Draft Final RI Report (Tt 2016), and readily available cost information on labor and material typical for similar projects. Cost estimates for this project will be further refined and may vary depending on the final design and contract bids at the time of final design implementation. For costing purposes, it is assumed that up to 2 vapor intrusion (VI) mitigation systems would need to be installed each year in Years 1-5, and 1 VI system would need to be installed each year in Years 6-30, and these and existing VI systems would be monitored and maintained. The total net present value presented has been rounded to the nearest $10,000.

(2) Total estimated present worth costs of alternatives are expressed in terms of constant purchasing power in 2046 dollars (30 years of long term costs). Total estimated present worth costs assume a real discount rate and lifecyle listed under the assumptions above. These are generally based on guidance from EPA OSWER document 540-R-00-002, with additional input based on existing estimated site-specific costs.

Table B-3. Cost Estimate - Alternative 3 - Capping, Dredge and Backfill FWWTP, & GETS Optimization
Feasibility Study
Church Road TCE Site, Mountain Top, Pennsylvania

DESCRIPTION	QUANTITY	UNIT	UNIT COST	CAPITAL COSTS [1]	NPV O&M COSTS [1,2]
Institutional Controls / Engineering Controls (ICs / ECs)					
ICs					
Evaluate existing deed restrictions/need for amendments or ordinances	1	year	$3,000		$37,000
Conduct Five-Year Reviews, Reporting	1	each	$20,000		$248,000
			subtotal	$0	$285,000
ECs					
Install Fencing & Warning Signage - Impacted Soil/Sediment Areas	1,000	linear feet	$15	$15,000	
Maintain Fencing & Warning Signage - Impacted Soil/Sediment Areas	1	year	$1,500		$18,600
			subtotal	$15,000	$19,000
				$15,000	$304,000
Contingency, QA/QC, procurement, project management	20%			$3,000	$61,000
Total Cost - ICs / ECs				**$18,000**	**$365,000**
Capping					
Pre-Design and Design Activities					
Biological survey and/or wetland delineation, reporting, agency interaction	1	lump sum	$10,000	$10,000	
Engineering design, specifications, and bidding support	1	lump sum	$10,000	$10,000	
Permitting	1	lump sum	$15,000	$15,000	
			subtotal	$35,000	$0
Cap Installation					
Surveying	1	lump sum	$5,000	$5,000	
Contractor mobilization/demobilization	1	lump sum	$5,000	$5,000	
Contractor project management (submittals, reporting, etc)	1	lump sum	$10,000	$10,000	
Site controls (erosion, utilities, etc)	1	lump sum	$5,000	$5,000	
Excavate onsite borrow source - 6-inch soil cover	300	cubic yard	$7	$2,100	
Grade cap area, install 60 mil liner, place sand, 6-inch soil cover	17,000	square foot	$1.50	$26,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$73,000	$0
Cap O&M					
Annual inspection, repairs, reporting	1	annual	$1,500		$19,000
			subtotal	$108,000	$19,000
Contingency, QA/QC, procurement, project management	20%			$22,000	$4,000
Total Cost - Capping				**$130,000**	**$23,000**
FWWTP - Dredging and Backfilling					
Pre-Design and Design Activities					
Engineering design, specifications, and bidding support	1	lump sum	$30,000	$30,000	
Permitting	1	lump sum	$25,000	$25,000	
			subtotal	$55,000	$0
Dredge and Backfill					
Mobilization/Demobilization	1	lump sum	$20,200	$20,000	
Site Prep (Workplans and submittals, grubbing and clearing, erosion controls)	1	lump sum	$22,900	$23,000	
Surveys (Pre-dredge, post-dredge, post cap)	1	lump sum	$10,000	$10,000	
Dredging and Processing	617	cubic yard	$37	$23,000	
Transprotation and Dispsoal	771	ton	$100	$77,200	
Backfill	617	cubic yard	$40.67	$25,000	
Restoration	1	lump sum	$5,200	$5,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$203,000	$0
Long Term Monitoring					
Semi-annual inspection and annual report.	5	annual	$10,000		$41,000
			subtotal	$258,000	$41,000
Contingency, QA/QC, procurement, project management	20%			$52,000	$8,000
Total Cost - Dredging and Backfilling				**$310,000**	**$49,000**
Groundwater Extraction & Treatment System Optimization					
System optimization design, testing, startup	1	lump sum	$40,000	$40,000	
System optimization construction, new recovery well installation	1	lump sum	$200,000	$200,000	
Replacement of system components after 20 years of operation	1	lump sum	$80,000	$80,000	
Routine O&M, preventive maintenance, system & well sampling, reporting	1	lump sum	$80,000		$993,000
			subtotal	$320,000	$993,000
Contingency, QA/QC, procurement, project management	20%			$64,000	$199,000
Total Cost - Groundwater Extraction Treatment System Optimization				**$384,000**	**$1,192,000**
Groundwater Monitoring					
Workplan preparation (Years 1-5)	1	annual	$17,000		$70,000
Groundwater Sampling (Years 1-5)	1	annual	$100,000		$410,000
Data Validation, Reporting (Years 1-5)	1	annual	$43,000		$176,000
Workplan preparation (Years 6-30)	1	annual	$5,000		$58,000
Groundwater Sampling (Years 6-30)	1	annual	$60,000		$699,000
Data Validation, Reporting (Years 6-30)	1	annual	$15,000		$175,000
			subtotal	$0	$1,588,000
Contingency, QA/QC, procurement, project management	20%			$0	$317,800
Total Cost - Groundwater Monitoring				**$0**	**$1,906,000**
Vapor Intrusion Monitoring & Mitigation					
System Installation (Years 1-5)	1	annual	$10,000		$41,000
Workplan preparation (Years 1-5)	1	annual	$5,000		$21,000
Monitoring (Years 1-5)	1	annual	$10,000		$41,000
Data Validation, Reporting (Years 1-5)	1	annual	$5,000		$21,000
System Installation (Years 6-30)	1	annual	$5,000		$58,000
Workplan preparation (Years 6-30)	1	annual	$2,500		$29,000
Monitoring (Years 6-30)	1	annual	$5,000		$58,000
Data Validation, Reporting (Years 6-30)	1	annual	$1,250		$15,000
			subtotal	$0	$284,000
Contingency, QA/QC, procurement, project management	20%			$0	$57,000
Total Cost - Vapor Intrusion Monitoring & Mitigation				**$0**	**$341,000**
Total Capital & NPV O&M Costs				**$842,000**	**$3,876,000**
TOTAL NET PRESENT VALUE FOR THIS ALTERNATIVE					**$4,718,000**

Assumptions

Number of years of remediation (capping O&M, groundwater monitoring, vapor mitigation)	30
Number of years of remediation (Dredge and Backfill O&M)	5
Real discount rate	7%

Footnotes

(1) Costs were estimated based on a conceptual design of remedial components that could address impacted media at the Site containing concentrations of constituents that exceed Remediation Goals (RGs) identified in this Feasibility Study (FS) Report, the results of the Remedial Investigation (RI) presented in the Draft Final RI Report (Tt 2016), and readily available cost information on labor and material typical for similar projects. Cost estimates for this project will be further refined and may vary depending on the final design and contract bids at the time of final design implementation. For costing purposes, it is assumed that up to 2 vapor intrusion (VI) mitigation systems would need to be installed each year in Years 1-5, and 1 VI system would need to be installed each year in Years 6-30, and these and existing VI systems would be monitored and maintained. The total net present value presented has been rounded to the nearest $10,000.

(2) Total estimated present worth costs of alternatives are expressed in terms of constant purchasing power in 2046 dollars (30 years of long term costs). Total estimated present worth costs assume a real discount rate and lifecyle listed under the assumptions above. These are generally based on guidance from EPA OSWER document 540-R-00-002, with additional input based on existing estimated site-specific costs.

Table B-4. Cost Estimate - Alternative 4 - Excavation, Dredge and Backfill FWWTP, & GETS Optimization
Feasibility Study
Church Road TCE Site, Mountain Top, Pennsylvania

DESCRIPTION	QUANTITY	UNIT	UNIT COST	CAPITAL COSTS	NPV O&M COSTS[1]
Institutional Controls / Engineering Controls (ICs / ECs)					
ICs					
Evaluate existing deed restrictions/need for amendments or ordinances	1	year	$3,000		$37,000
Conduct Five-Year Reviews, Reporting	1	each	$20,000		$248,000
			subtotal	$0	$285,000
ECs					
Install Fencing & Warning Signage - Impacted Soil/Sediment Areas	1,000	linear feet	$15	$15,000	
Maintain Fencing & Warning Signage - Impacted Soil/Sediment Areas	1	year	$1,500		$19,000
			subtotal	$15,000	$19,000
			subtotal	$15,000	$304,000
Contingency, QA/QC, procurement, project management	20%			$3,000	$61,000
Total Cost - ICs / ECs				**$18,000**	**$365,000**
Excavation					
Pre-Design and Design Activities					
Biological survey and/or wetland delineation, reporting, agency interaction	1	lump sum	$10,000	$10,000	
Engineering design, specifications, and bidding support	1	lump sum	$50,000	$50,000	
Permitting	1	lump sum	$15,000	$15,000	
			subtotal	$75,000	$0
Removal					
Surveying	1	lump sum	$10,000	$10,000	
Contractor mobilization/demobilization	1	lump sum	$10,000	$10,000	
Contractor project management (submittals, reporting, etc)	1	lump sum	$20,000	$20,000	
Excavate, haul and stockpile waste	5,200	cubic yard	$10	$52,000	
Site controls (erosion, utilities, etc)	1	lump sum	$10,000	$10,000	
Onsite borrow backfill, grading, compaction	6,800	cubic yard	$7	$47,600	
Transportation	7,800	tons	$15	$117,000	
Offsite Disposal	7,800	tons	$50	$390,000	
Engineering oversight, confirmation sampling, and reporting	1	lump sum	$50,000	$50,000	
			subtotal	$707,000	$0
Contingency, QA/QC, procurement, project management	20%			$141,000	$0
Total Cost - Excavation				**$923,000**	**$0**
FWWTP - Dredging and Backfilling					
Pre-Design and Design Activities					
Engineering design, specifications, and bidding support	1	lump sum	$30,000	$30,000	
Permitting	1	lump sum	$25,000	$25,000	
			subtotal	$55,000	$0
Dredge and Backfill					
Mobilization/Demobilization	1	lump sum	$20,200	$20,000	
Site Prep (Workplans and submittals, grubbing and clearing, erosion controls)	1	lump sum	$22,900	$23,000	
Surveys (Pre-dredge, post-dredge, post cap)	1	lump sum	$10,000	$10,000	
Dredging and Processing	617	cubic yard	$37	$23,000	
Transprotation and Dispsoal	771	ton	$100	$77,200	
Backfill	617	cubic yard	$40.67	$25,000	
Restoration	1	lump sum	$5,200	$5,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$203,000	$0
Long Term Monitoring					
Semi-annual inspection and annual report.	5	annual	$10,000		$41,000
			subtotal	$258,000	$41,000
Contingency, QA/QC, procurement, project management	20%			$52,000	$8,000
Total Cost - Dredging and Backfilling				**$310,000**	**$49,000**
Groundwater Extraction & Treatment System Optimization					
System optimization design, testing, startup	1	lump sum	$40,000	$40,000	
System optimization construction, new recovery well installation	1	lump sum	$200,000	$200,000	
Replacement of system components after 20 years of operation	1	lump sum	$80,000	$80,000	
Routine O&M, preventive maintenance, system & well sampling, reporting	1	lump sum	$80,000		$993,000
			subtotal	$320,000	$993,000
Contingency, QA/QC, procurement, project management	20%			$64,000	$199,000
Total Cost - Groundwater Extraction Treatment System Optimization				**$384,000**	**$1,192,000**
Groundwater Monitoring					
Workplan preparation (Years 1-5)	1	annual	$17,000		$70,000
Groundwater Sampling (Years 1-5)	1	annual	$50,000		$205,000
Data Validation, Reporting (Years 1-5)	1	annual	$43,000		$176,000
Workplan preparation (Years 6-30)	1	annual	$5,000		$58,000
Groundwater Sampling (Years 6-30)	1	annual	$20,000		$233,000
Data Validation, Reporting (Years 6-30)	1	annual	$15,000		$175,000
			subtotal	$0	$917,000
Contingency, QA/QC, procurement, project management	20%			$0	$183,000
Total Cost - Groundwater Monitoring				**$0**	**$1,100,000**
Vapor Intrusion Monitoring & Mitigation					
System Installation (Years 1-5)	1	annual	$10,000		$41,000
Workplan preparation (Years 1-5)	1	annual	$5,000		$21,000
Monitoring (Years 1-5)	1	annual	$10,000		$41,000
Data Validation, Reporting (Years 1-5)	1	annual	$5,000		$21,000
System Installation (Years 6-30)	1	annual	$5,000		$58,000
Workplan preparation (Years 6-30)	1	annual	$2,500		$29,000
Monitoring (Years 6-30)	1	annual	$5,000		$58,000
Data Validation, Reporting (Years 6-30)	1	annual	$1,250		$15,000
			subtotal	$0	$284,000
Contingency, QA/QC, procurement, project management	20%			$0	$57,000
Total Cost - Vapor Intrusion Monitoring & Mitigation				**$0**	**$341,000**
Total Capital & NPV O&M Costs				**$1,635,000**	**$3,047,000**
TOTAL NET PRESENT VALUE FOR THIS ALTERNATIVE				**$4,682,000**	

Assumptions

Number of years of remediation (GET S O&M, groundwater monitoring, vapor mitigation)	30
Number of years of remediation (Dredge and Backfill O&M)	5
Real discount rate	7%

Footnotes

(1) Costs were estimated based on a conceptual design of remedial components that could address impacted media at the Site containing concentrations of constituents that exceed Remediation Goals (RGs) identified in this Feasibility Study (FS) Report, the results of the Remedial Investigation (RI) presented in the Draft Final RI Report (Tt 2016), and readily available cost information on labor and material typical for similar projects. Cost estimates for this project will be further refined and may vary depending on the final design and contract bids at the time of final design implementation. For costing purposes, it is assumed that up to 2 vapor intrusion (VI) mitigation systems would need to be installed each year in Years 1-5, and 1 VI system would need to be installed each year in Years 6-30, and these and existing VI systems would be monitored and maintained. The total net present value presented has been rounded to the nearest $10,000.

(2) Total estimated present worth costs of alternatives are expressed in terms of constant purchasing power in 2046 dollars (30 years of long term costs). Total estimated present worth costs assume a real discount rate and lifecyle listed under the assumptions above. These are generally based on guidance from EPA OSWER document 540-R-00-002, with additional input based on existing estimated site-specific costs.

Table B-5. Cost Estimate - Alternative 5 - Capping, Source Area Treatment, Dredge and Backfill FWWTP, & GETS Optimization
Feasibility Study
Church Road TCE Site, Mountain Top, Pennsylvania

DESCRIPTION	QUANTITY	UNIT	UNIT COST	CAPITAL COSTS (1)	NPV O&M COSTS (1,2)
Institutional Controls / Engineering Controls (ICs / ECs)					
ICs					
Evaluate existing deed restrictions/need for amendments or ordinances	1	year	$3,000		$37,000
Conduct Five-Year Reviews, Reporting	1	each	$20,000		$248,000
			subtotal	$0	$285,000
ECs					
Install Fencing & Warning Signage - Impacted Soil/Sediment Areas	1,000	linear feet	$15	$15,000	
Maintain Fencing & Warning Signage - Impacted Soil/Sediment Areas	1	year	$1,500		$19,000
			subtotal	$15,000	$19,000
				$15,000	$304,000
Contingency, QA/QC, procurement, project management	20%			$3,000	$61,000
Total Cost - ICs / ECs				**$18,000**	**$365,000**
Capping					
Pre-Design and Design Activities					
Biological survey and/or wetland delineation, reporting, agency interaction	1	lump sum	$10,000	$10,000	
Engineering design, specifications, and bidding support	1	lump sum	$10,000	$10,000	
Permitting	1	lump sum	$15,000	$15,000	
			subtotal	$35,000	$0
Cap Installation					
Surveying	1	lump sum	$5,000	$5,000	
Contractor mobilization/demobilization	1	lump sum	$5,000	$5,000	
Contractor project management (submittals, reporting, etc)	1	lump sum	$10,000	$10,000	
Site controls (erosion, utilities, etc)	1	lump sum	$5,000	$5,000	
Excavate offsite borrow source - 6-inch soil cover	200	cubic yard	$7	$1,400	
Grade cap area, install 60 mil liner, place sand, 6-inch soil cover	11,000	square foot	$1.50	$17,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$63,000	$0
Cap O&M					
Annual inspection, repairs, reporting	1	annual	$1,500		$19,000
			subtotal	$98,000	$19,000
Contingency, QA/QC, procurement, project management	20%			$20,000	$4,000
Total Cost - Capping				**$118,000**	**$23,000**
FWWTP - Dredging and Backfilling					
Pre-Design and Design Activities					
Engineering design, specifications, and bidding support	1	lump sum	$30,000	$30,000	
Permitting	1	lump sum	$25,000	$25,000	
			subtotal	$55,000	$0
Dredge and Backfill					
Mobilization/Demobilization	1	lump sum	$20,200	$20,000	
Site Prep (Workplans and submittals, grubbing and clearing, erosion controls)	1	lump sum	$22,900	$23,000	
Surveys (Pre-dredge, post-dredge, post cap)	1	lump sum	$10,000	$10,000	
Dredging and Processing	617	cubic yard	$37	$23,000	
Transprotation and Dispsoal	771	ton	$100	$77,200	
Backfill	617	cubic yard	$40.67	$25,000	
Restoration	1	lump sum	$5,200	$5,000	
Engineering oversight and implementation reporting	1	lump sum	$20,000	$20,000	
			subtotal	$203,000	$0
Long Term Monitoring					
Semi-annual inspection and annual report.	5	annual	$10,000		$41,000
			subtotal	$258,000	$41,000
Contingency, QA/QC, procurement, project management	20%			$52,000	$8,000
Total Cost - Dredging and Backfilling				**$310,000**	**$49,000**
Soil Vapor Extraction					
Pre-Design and Design Activities					
Survey	1	lump sum	$20,000	$20,000	
Engineering design, specifications, and bidding support	1	lump sum	$30,000	$30,000	
Air discharge permitting	1	lump sum	$5,000	$5,000	
			subtotal	$55,000	$0
System Installation					
Contractor mobilization/demobilization	1	lump sum	$10,000	$10,000	
Contractor project management (submittals, reporting, etc)	1	lump sum	$20,000	$20,000	
Surface Cap	6,000	sf	$3	$18,000	
Soil Vapor Extraction system installation, startup	1	lump sum	$150,000	$150,000	
Engineering oversight and implementation reporting	1	lump sum	$70,000	$70,000	
			subtotal	$268,000	$0
System O&M					
Remote operation, monthly maintenance & sampling, annual reporting, post-treatment system removal	2	annual	$50,000		$100,000
			subtotal	$0	$100,000
			subtotal	$323,000	$100,000
Contingency, QA/QC, procurement, project management	20%			$65,000	$20,000
Total Cost - Soil Vapor Extraction				**$388,000**	**$120,000**
Groundwater Extraction Treatment System Optimization					
System optimization design, testing, startup	1	lump sum	$40,000	$40,000	
System optimization construction, new recovery well installation	1	lump sum	$200,000	$200,000	
Replacement of system components after 20 years of operation	1	lump sum	$80,000	$80,000	
Routine O&M, preventive maintenance, system & well sampling, reporting	1	lump sum	$80,000		$993,000
			subtotal	$320,000	$993,000
Contingency, QA/QC, procurement, project management	20%			$64,000	$199,000
Total Cost - Groundwater Treatment System Optimization				**$384,000**	**$1,192,000**
Groundwater Monitoring					
Workplan preparation (Years 1-5)	1	annual	$17,000		$70,000
Groundwater Sampling (Years 1-5)	1	annual	$50,000		$205,000
Data Validation, Reporting (Years 1-5)	1	annual	$43,000		$176,000
Workplan prepairation (Years 6-30)	1	annual	$5,000		$58,000
Groundwater Sampling (Years 6-30)	1	annual	$20,000		$233,000
Data Validation, Reporting (Years 6-30)	1	annual	$15,000		$175,000
			subtotal	$0	$917,000
Contingency, QA/QC, procurement, project management	20%			$0	$183,000
Total Cost - Groundwater Monitoring				**$0**	**$842,000**
Vapor Intrusion Monitoring & Mitigation					
System Installation (Years 1-5)	1	annual	$10,000		$41,000
Workplan preparation (Years 1-5)	1	annual	$5,000		$21,000
Monitoring (Years 1-5)	1	annual	$10,000		$41,000
Data Validation, Reporting (Years 1-5)	1	annual	$5,000		$21,000
System Installation (Years 6-30)	1	annual	$5,000		$58,000
Workplan preparation (Years 6-30)	1	annual	$2,500		$29,000
Monitoring (Years 6-30)	1	annual	$5,000		$58,000
Data Validation, Reporting (Years 6-30)	1	annual	$1,250		$15,000
			subtotal	$0	$284,000
Contingency, QA/QC, procurement, project management	20%			$0	$57,000
Total Cost - Vapor Intrusion Monitoring & Mitigation				**$0**	**$341,000**
EPA Fees					
Total Capital & NPV O&M Costs				**$1,218,000**	**$2,932,000**
TOTAL NET PRESENT VALUE FOR THIS ALTERNATIVE					**$4,150,000**

Assumptions

Number of years of remediation (SVE)	2
Number of years of remediation (cap O&M)	30
Number of years of remediation (Dredge and Backfill O&M)	5
Number of years of remediation (GETS optimization, groundwater monitoring, vapor mitigation)	30
Real discount rate	7%

Footnotes

(1) Costs were estimated based on a conceptual design of remedial components that could address impacted media at the Site containing concentrations of constituents that exceed Remediation Goals (RGs) identified in this Feasibility Study (FS) Report, the results of the Remedial Investigation (RI) presented in the Draft Final RI Report (TI 2016), and readily available cost information on labor and material typical for similar projects. Cost estimates for this project will be further refined and may vary depending on the final design and contract bids at the time of final design implementation. For costing purposes, it is assumed that up to 2 vapor intrusion (VI) mitigation systems would need to be installed each year in Years 1-5, and 1 VI system would need to be installed each year in Years 6-30, and these and existing VI systems would be monitored and maintained. The total net present value presented has been rounded to the nearest $10,000.

(2) Total estimated present worth costs of alternatives are expressed in terms of constant purchasing power in 2045 dollars (30 years of long term costs). Total estimated present worth costs assume a real discount rate and lifecyle listed under the assumptions above. These are generally based on guidance from EPA OSWER document 540-R-00-002, with additional input based on existing estimated site specific costs.

APPENDIX B

INTERIM REMEDIAL DESIGN

STATEMENT OF WORK

FOSTER WHEELER ENERGY CORPORATION/CHURCH ROAD TCE SUPERFUND SITE

Mountain Top, Luzerne County, Commonwealth of Pennsylvania

EPA Region III

May 2019

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Purpose of the SOW. This Statement of Work (SOW) sets forth the procedures and requirements for implementing the Work.

1.2 Structure of the SOW.

- Section 2 (Community Involvement) sets forth EPA's and Respondent's responsibilities for community involvement.
- Section 3 (Interim Remedial Design) sets forth the process for developing the Interim RD, which includes the submission of specified primary deliverables.
- Section 5 (Reporting) sets forth Respondent's reporting obligations.
- Section 6 (Deliverables) describes the content of the supporting deliverables and the general requirements regarding Respondent's submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 7 (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 Interim RD.
- Section 8 (State Participation) addresses State participation.
- Section 9 (References) provides a list of references, including URLs.

1.3 The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Administrative Settlement Agreement and Order on Consent for Interim Remedial Design ("Settlement"), have the meanings assigned to them in CERCLA, in such regulations, or in the Settlement, 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 Community Involvement Responsibilities

(a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. Previously during the RI/FS phase, EPA developed a Community Involvement Plan (CIP) for the Site. Pursuant to 40 C.F.R. § 300.435(c), EPA shall review the existing CIP and determine whether it should be revised to describe further public involvement activities during the Work that are not already addressed or provided for in the existing CIP.

(b) If requested by EPA, Respondent shall participate in community involvement activities, including participation in (1) the preparation of information regarding the Work for dissemination to the public, with consideration given to including mass media and/or Internet notification, and (2) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site. Respondent's support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to (1) any Community

Advisory Groups, (2) any Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CIP Respondent's responsibilities for community involvement activities. All community involvement activities conducted by Respondent at EPA's request are subject to EPA's oversight. Upon EPA's request, Respondent shall establish a community information repository at or near the Site to house one copy of the administrative record.

(c) **Respondent's CI Coordinator**. If requested by EPA, Respondent shall, within 15 days, designate and notify EPA of Respondent's Community Involvement Coordinator (Respondent's CI Coordinator). Respondent may hire a contractor for this purpose. Respondent's notice must include the name, title, and qualifications of the Respondent's CI Coordinator. Respondent's CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

3. INTERIM REMEDIAL DESIGN

3.1 Interim RD Work Plan. Respondent shall submit an Interim Remedial Design (Interim RD) Work Plan (IRDWP) for EPA approval. The IRDWP must include:

(a) Plans for implementing all RD activities identified in this SOW, in the IRDWP, or required by EPA to be conducted to develop the Interim RD;

(b) A description of the overall management strategy for performing the Interim RD, 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 Interim Remedial Action (Interim RA) 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 Interim RD;

(e) Descriptions of any areas requiring clarification and/or anticipated problems (e.g., data gaps);

(f) Description of any proposed pre-design investigation;

(g) Description of any proposed treatability study;

(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 ¶ 5.6 (Supporting Deliverables): Health and Safety Plan; and Emergency Response Plan; Field Sampling Plan; Quality Assurance Plan; and Emergency Response Plan.

3.2 Respondent shall meet regularly with EPA to discuss design issues as necessary, as directed or determined by EPA.

3.3 **Pre-Design Investigation**. The purpose of the Pre-Design Investigation (PDI) is to address data gaps identified in the RI/FS by conducting additional field investigations.

(a) **PDI Work Plan**. If EPA requests, Respondent 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 ¶ 5.6(d).

(b) Following the PDI, Respondent shall submit a PDI 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 Interim RD, including design parameters and criteria.

(c) EPA may require Respondent to supplement the PDI Evaluation Report and/or to perform additional pre-design studies.

3.4 Treatability Study

(a) Respondent shall perform a Treatability Study (TS) for the purpose of selecting appropriate treatment for the contaminated soil.

(b) Respondent shall submit a TS Work Plan (TSWP) for EPA approval. Respondent shall prepare the TSWP in accordance with EPA's *Guide for Conducting Treatability Studies under CERCLA, Final* (Oct. 1992), as supplemented for RD by the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995).

(c) Following completion of the TS, Respondent shall submit a TS Evaluation Report for EPA comment.

(d) EPA may require Respondent to supplement the TS Evaluation Report and/or to perform additional treatability studies.

3.5 Preliminary (30%) Interim RD. Respondent shall submit a Preliminary (30%) Interim RD for EPA's comment. The Preliminary Interim RD 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 Interim RA 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 dust suppression, during the Interim RA; and

(g) Updates of all supporting deliverables required to accompany the IRDWP and the following additional supporting deliverables described in ¶ 5.6 (Supporting Deliverables): Site Wide Monitoring Plan; Construction Quality Assurance/Quality Control Plan; Transportation and Off-Site Disposal Plan; O&M Plan; O&M Manual; and Institutional Controls Implementation and Assurance Plan.

3.6 **Pre-Final (95%) Interim RD**. Respondent shall submit the Pre-final (95%) Interim RD for EPA's comment. The Pre-final Interim RD must be a continuation and expansion of the previous design submittal and must address EPA's comments regarding the Preliminary Interim RD. The Pre-final Interim RD will serve as the approved Final (100%) Interim RD if EPA approves the Pre-final Interim RD without comments. The Pre-final Interim RD must include:

(a) A complete set of construction drawings and specifications that are: (1) certified by a registered professional engineer; (2) suitable for procurement; and (3) follow the Construction Specifications Institute's MasterFormat 2012;

(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 Interim RD;

(d) A specification for photographic documentation of the RA; and

(e) Updates of all supporting deliverables required to accompany the Preliminary (30%) Interim RD.

3.7 **Final (100%) Interim RD**. Respondent shall submit the Final (100%) Interim RD for EPA approval. The Final Interim RD must address EPA's comments on the Pre-final Interim RD and must include final versions of all Pre-final Interim RD deliverables.

3.8 **Emergency Response and Reporting**

(a) **Emergency Response and Reporting**. 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, Respondent shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) no less than 48 hours after the onset of the event orally notify the authorized EPA officer (as specified in ¶ 3.8(c)); 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 Respondent are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, Respondent shall immediately notify the authorized EPA officer orally.

(c) The "authorized EPA officer" for purposes of immediate oral notifications and consultations under ¶ 3.8(a) and ¶ 3.8(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or the EPA Region III Hotline at (215) 814-3255 (if neither EPA Project Coordinator is available).

(d) For any event covered by ¶ 3.8(a) and ¶ 3.8(b), Respondent shall:

(1) within 5 days after the onset of such event, submit a written report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and

(2) within 14 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 ¶ 3.8 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

3.9 Off-Site Shipments

(a) Respondent may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Respondent 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) Respondent may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, it provides 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. Respondent 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-state facility. Respondent shall provide the notice as soon as practicable after the award of the contract and before the Waste Material is shipped.

(c) Respondent may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, *EPA's Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the IROD. 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.

3.10 Notice of Work Completion

(a) When EPA determines, after EPA's review of the Final 100% Interim RD under ¶ 3.7 (Final (100%) Interim RD), that all Work has been fully performed in accordance with this Settlement, with the exception of any continuing obligations as provided in ¶ 3.10(c), EPA will provide written notice to Respondent. If EPA determines that any such Work has not been completed in accordance with this Settlement, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the Interim RD Work Plan if appropriate in order to correct such deficiencies.

(b) Respondent shall implement the modified and approved Interim RD Work Plan and shall submit a modified Final 100% Report for EPA approval in accordance with the EPA notice. If approved, EPA will issue the Notice of Work Completion.

(c) Issuance of the Notice of Work Completion does not affect the following continuing obligations: (1) obligations under Sections VIII (Property Requirements), IX (Access to Information), and X (Record Retention) of the Settlement; and (3) reimbursement of EPA's Future Response Costs under Section XII (Payment of Response Costs) of the Settlement.

4. REPORTING

4.1 Progress Reports. Respondent shall submit progress reports to EPA on a monthly basis, or as otherwise requested by EPA, from the date of receipt of EPA's approval of the Interim RD Work Plan until issuance of Notice of Work Completion pursuant to ¶ 3.10, unless otherwise directed in writing by EPA's Project Coordinator. 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 Settlement;

(b) A summary of all results of sampling, tests, and all other data received or generated by Respondent;

(c) A description of all deliverables that Respondent submitted to EPA;

(d) A description of all activities scheduled for the next six weeks;

(e) Information regarding percentage of completion, unresolved 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 Respondent has 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.

4.2 Notice of Progress Report Schedule Changes. If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 4.1(d), changes, Respondent shall notify EPA of such change at least seven days before performance of the activity.

5. DELIVERABLES

5.1 Applicability. Respondent 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 5.2 (In Writing) through 5.4 (Technical Specifications) apply to all deliverables. Paragraph 5.5 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

5.2 In Writing. All deliverables under this SOW must be in writing unless otherwise specified.

5.3 General Requirements for Deliverables

(a) Except as otherwise provided in this Order, Respondent shall direct all deliverables required by this Order to the EPA Project Coordinator at Will Geiger, U.S. Environmental Protection Agency, 1650 Arch Street, Philadelphia, PA 19103, (215) 814-3413, geiger.will@epa.gov.

(b) All deliverables provided to the State in accordance with Section 7 (State Participation) shall be directed to Donald Rood, Licensed Professional Geologist, State Project Coordinator, Pennsylvania Department of Environmental Protection, 2 Public Square, Wilkes-Barre, PA 18701-1915, dorood@pa.gov.

(c) All deliverables must be submitted by the deadlines in the Interim RD Schedule, as applicable. Respondent shall submit all deliverables to EPA in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 5.4. 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", Respondent shall also provide EPA with paper copies of such exhibits.

5.4 Technical Specifications

(a) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (EDD) format. Other delivery methods may be allowed if

electronic direct submission presents a significant burden or as technology changes.

(b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase 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 Respondent does not, and is not intended to, define the boundaries of the Site.

5.5 Approval of Deliverables

(a) **Initial Submissions**

(1) After review of any deliverable that is required to be submitted for EPA approval under the Settlement 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 ¶ 5.5(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 5.5(a), Respondent shall, within 14 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 Respondent to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation**. Upon approval, approval upon conditions, or modification by EPA under ¶ 5.5(a) (Initial Submissions) or ¶ 5.5(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Settlement; and (2) Respondent 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 ¶ 5.5(a) or ¶ 5.5(b) does not relieve Respondent of any liability for stipulated penalties under Section XV (Stipulated Penalties) of the Settlement.

5.6 Supporting Deliverables. Respondent shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. Respondent shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 8 (References)). Respondent 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**. The Health and Safety Plan (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. Respondent shall develop the HASP in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP required by this Interim RD SOW should cover Interim RD activities and should be, as appropriate, updated to cover activities during the Interim RA and updated to cover activities after Interim RA 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**. The Emergency Response Plan (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, State, 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 ¶ 3.8(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and

(5) A description of all necessary actions to ensure compliance with ¶ 3.8 (Emergency Response and Reporting) 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**. The Field Sampling Plan (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. Respondent 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**. The Quality Assurance Project Plan (QAPP) augments the FSP and addresses sample analysis and data handling regarding the Work. The QAPP must include a detailed explanation of Respondent's quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. Respondent shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005). The QAPP also must include procedures:

(1) To ensure that EPA and the State and their authorized representative have reasonable access to laboratories used by Respondent in implementing the Settlement (Respondent's Labs);

(2) To ensure that Respondent's Labs analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;

(3) To ensure that Respondent's Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;

(4) To ensure that Respondent's Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;

(5) For Respondent to provide EPA and the State with notice at least 28 days prior to any sample collection activity;

(6) For Respondent to provide split samples and/or duplicate samples to EPA and the State upon request;

(7) For EPA and the State to take any additional samples that they deem necessary;

(8) For EPA and the State to provide to Respondent, upon request, split samples and/or duplicate samples in connection with EPA's and the State's oversight sampling; and

(9) For Respondent to submit to EPA and the State all sampling and tests results and other data in connection with the implementation of the Settlement.

(e) **Site Wide Monitoring Plan**. The purpose of the Site Wide Monitoring Plan (SWMP) is to obtain baseline information regarding the extent of contamination in affected media at the Site; 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 Interim RA; to obtain information regarding contamination levels to determine whether Performance Standards (PS) are achieved; and to obtain information to determine whether to perform additional actions, including further Site monitoring. The SWMP 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 State agencies; and

(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).

(f) **Construction Quality Assurance/Quality Control Plan (CQA/QCP)**. The purpose of the Construction Quality Assurance Plan (CQAP) is to describe planned and systemic activities that provide confidence that the Interim RA construction will satisfy all plans, specifications, and related requirements, including quality objectives. The purpose of the Construction Quality Control Plan (CQCP) is to describe the activities to verify that Interim RA construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQA/QCP must:

(1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/QCP;

(2) Describe the PS required to be met to achieve Completion of the Interim RA;

(3) Describe the activities to be performed: (i) to provide confidence that PS will be met; and (ii) to determine whether PS have been met;

(4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/QCP;

(5) Describe industry standards and technical specifications used in implementing the CQA/QCP;

(6) Describe procedures for tracking construction deficiencies from identification through corrective action;

(7) Describe procedures for documenting all CQA/QCP activities; and

(8) Describe procedures for retention of documents and for final storage of documents.

(g) **O&M Plan**. The O&M Plan describes the requirements for inspecting, operating, and maintaining the Interim RA. Respondent shall develop the draft 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 PS required to be met to implement the IROD;

(2) Description of activities to be performed: (i) to provide confidence that PS will be met; and (ii) to determine whether PS 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 State 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 PS; (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 PS are not achieved; and a schedule for implementing these corrective actions.

(h) **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. Respondent shall develop the draft O&M Manual in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017).

(i) **Institutional Controls Implementation and Assurance Plan**. The Institutional Controls Implementation and Assurance Plan (ICIAP) describes plans to implement, maintain, and enforce the Institutional Controls (ICs) at the Site. Respondent 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). The ICIAP must include the following additional requirements:

(1) 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

(2) Legal descriptions and survey maps that are prepared according to current American Land Title Association (ALTA) Survey guidelines and certified by a licensed surveyor.

6. SCHEDULES

6.1 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 Interim RD Schedule set forth below. Respondent may submit proposed revised Interim RD Schedules for EPA approval. Upon EPA's approval, the revised Interim RD

Schedules supersede the Interim RD Schedules set forth below, and any previously-approved Interim RD Schedules.

6.2 Interim RD Schedule

	Description of Deliverable, Task	¶ Ref.	Deadline
1	IRDWP	3.1	30 days after EPA's Authorization to Proceed regarding Supervising Contractor under Settlement ¶ 13.c
2	PDIWP	[3.3(a)]	45 days after EPA's Authorization to Proceed regarding Supervising Contractor under Settlement ¶ 13.c
3	Preliminary (30%) Interim RD	3.5, 3.3(a)	120 days after EPA approval of Final IRDWP
4	Pre-final (90/95%) Interim RD	3.7	120 days after EPA comments on Preliminary Interim RD
5	Final (100%) Interim RD	3.8	45 days after EPA comments on Pre-final Interim RD

7. STATE PARTICIPATION

7.1 **Copies**. Respondent shall, at any time it sends a deliverable to EPA, send a copy of such deliverable to the State. EPA shall, at any time it sends a notice, authorization, approval, or disapproval to Respondent, send a copy of such document to the State.

7.2 **Review and Comment**. The State will have a reasonable opportunity for review and comment prior to:

(a) Any EPA approval or disapproval under ¶ 5.5 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and

(b) any disapproval of, or Notice of Work Completion under, ¶ 3.10 (Notice of Work Completion).

8. REFERENCES

8.1 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 two EPA Web pages listed in ¶ 8.2:

(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/G-90/001 (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, 540-R-01-007 (June 2001).

(o) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).

(p) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).

(q) Quality management systems for environmental information and technology programs -- Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).

(r) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005).

(s) Superfund Community Involvement Handbook SEMS 100000070 (January 2016), https://www.epa.gov/superfund/community-involvement-tools-and-resources.

(t) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).

(u) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006).

(v) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).

(w) USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4 (Dec. 2006).

(x) USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2 (amended Apr. 2007).

(y) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2008), https://www.epa.gov/geospatial/geospatial-policies-and-standards and https://www.epa.gov/geospatial/epa-national-geospatial-data-policy.

(z) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).

(aa) Principles for Greener Cleanups (Aug. 2009), https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups.

(bb) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.2 (Jan. 2010).

(cc) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).

(dd) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).

(ee) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

(ff) Construction Specifications Institute's MasterFormat 2012, available from the Construction Specifications Institute, http://www.csinet.org/masterformat.

(gg) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012).

(hh) 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).

(ii) 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).

(jj) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), http://www.epaosc.org/_HealthSafetyManual/manual-index.htm.

(kk) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).

(ll) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).

(mm) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).

(nn) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), https://www.epa.gov/superfund/superfund-post-construction-completion.

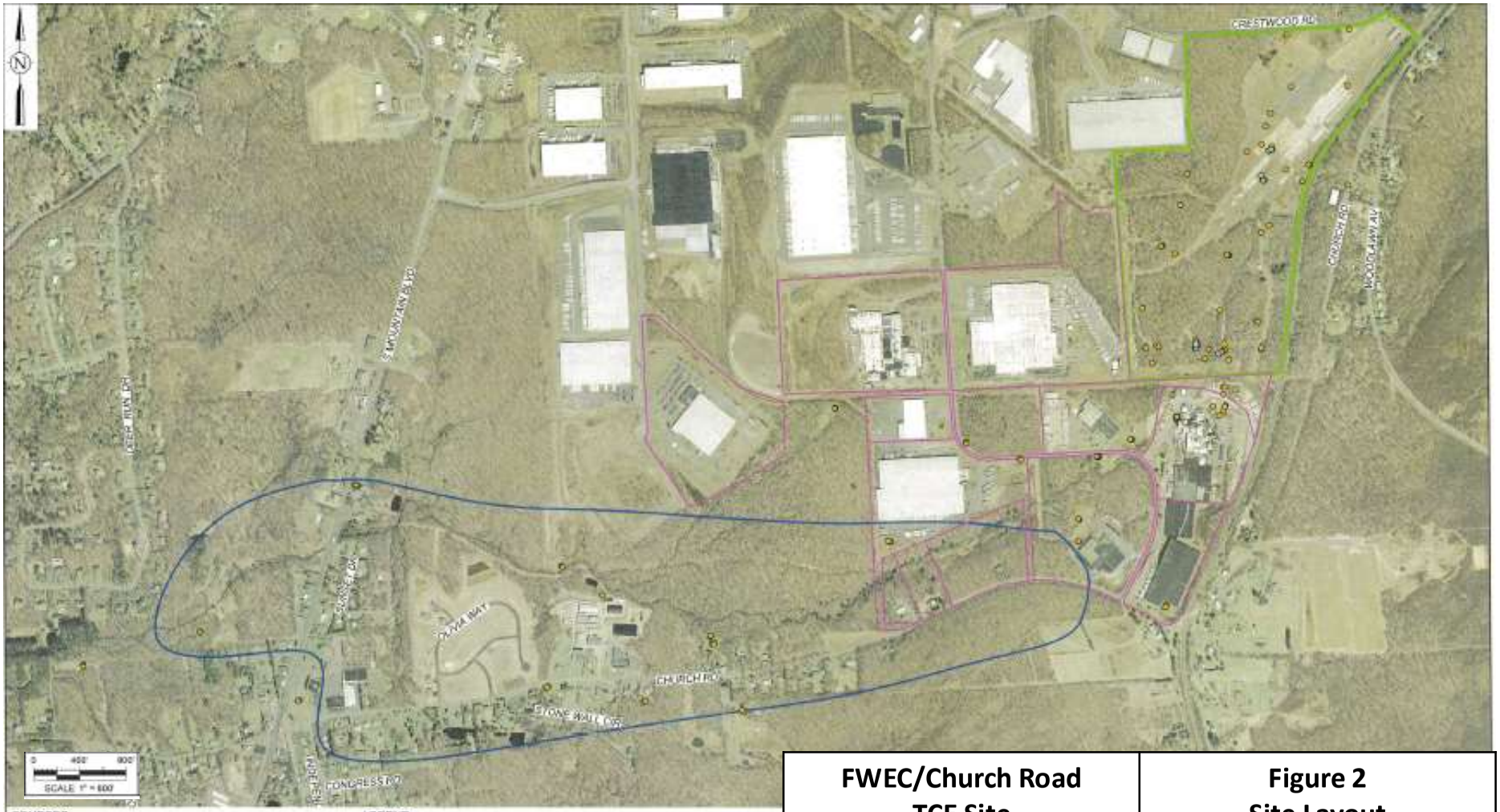
8.2 A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance: https://www.epa.gov/superfund/superfund-policy-guidance-and-laws

Test Methods Collections: https://www.epa.gov/measurements/collection-methods

8.3 For any regulation or guidance referenced in the Settlement 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 Respondent receives notification from EPA of the modification, amendment, or replacement.

APPENDIX C



Adapted from FWEC FS Figure 2

FWEC/Church Road TCE Site	Figure 2 Site Layout
US EPA REGION III 1650 Arch Street Philadelphia, Pennsylvania 19103	EPA United States Environmental Protection Agency