# Site-Specific Quality Assurance Project Plan

## Kinneytown Dam, Seymour, Connecticut

## Phase II – Environmental Site Assessment

**August 2023**

Prepared for:
**Environmental Protection Agency**
**Targeted Brownfields Assessment Program**
EPA New England, Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912

**Naugatuck Valley Council of Governments** and
**Connecticut Brownfield Land Bank**
49 Leavenworth Street, Waterbury CT, 06702

U.S. Department of Transportation
Volpe Center

# Contents

## List of Tables



## List of Figures



## Appendices

# Acronyms and Abbreviations

| | |
|---|---|
| ACM | asbestos containing materials |
| AHERA | Asbestos Hazard Emergency Response Act |
| BTAG | Biological Technical Assistance Group |
| C&D | construction and demolition |
| CoC | contaminant of concern |
| CT DEEP | Connecticut Department of Energy and Environmental Protection |
| CT-RCS | CT Residential Direct Exposure Criteria for soil |
| EPA | United States Environmental Protection Agency |
| ESA | environmental site assessment |
| ESV | ecological screening values |
| ETPH | extractable total petroleum hydrocarbons |
| ft. bgs | feet below ground surface |
| FPEC | freshwater probable effect concentration |
| FTEC | freshwater threshold effect concentration |
| LBP | lead-based paint |
| GPR | ground penetrating radar |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NOAA | National Oceanic and Atmospheric Administration |
| NVCOG | Naugatuck Valley Council of Government |
| NYSDEC | New York State Department of Environmental Conservation |
| PCB | polychlorinated biphenyl |
| PID | photoionization detector |
| PFAS | per- and polyfluoroalkyl substances |
| QA | quality assurance |
| QAPP | Quality Assurance Project Plan |
| RSV | refinement screening values |
| SOP | standard operating procedure |
| SQG | sediment quality guideline |
| SQuiRTs | screening quick reference tables |
| SSQAPP | Site-Specific Quality Assurance Project Plan |
| SVOC | semivolatile organic compound |
| TBA | targeted brownfields assessment |
| TSCA | Toxic Substances Control Act |
| U.S. DOT | United States Department of Transportation |
| VOC | volatile organic compound |
| Volpe | U.S. DOT Volpe National Transportation Systems Center |

# 1.0 Title and Approval Page

**Project Name:** Kinneytown Dam, Seymour, CT Phase II ESA

**Project Location:** 677 South Main Street, Seymour, CT, Parcel ID: 11-03-35-0; 769 Derby Avenue, Seymour, CT, Parcel ID: 12-04-24; 0 Hotchkiss Terrace, Ansonia, CT, Parcel ID: 036-0001-0003

**Document Title:** Site-Specific Quality Assurance Project Plan

**Lead Organization:** Untied States Environmental Protection Agency Region 1

**Interagency Agreement Number:** VXBS

**Preparer:** U.S. DOT Volpe National Transportation Systems Center

**Preparer address and contact info:** 55 Broadway, Cambridge, MA 02142, 617-494-3974

**Date:** 6/9/23 **Rev:** 1.0

This Site-Specific Quality Assurance Project Plan (SSQAPP) supplements the U.S. DOT Volpe Brownfields Generic Quality Assurance Project Plan (# 23063).

---

**Volpe Program Manager:** Michelle Heimgartner, Senior Environmental Engineer

MICHELLE MORRIS HEIMGARTNER

Digitally signed by MICHELLE MORRIS HEIMGARTNER
Date: 2023.08.11 13:47:27 -04'00'

---

**Volpe QA Officer:** Chadd Fry, General Engineer

CHADD MITCHELL FRY

Digitally signed by CHADD MITCHELL FRY
Date: 2023.08.11 13:54:51 -04'00'

---

**EPA QA Reviewer:** Emily Ambeliotis

EMILY AMBELIOTIS

Digitally signed by EMILY AMBELIOTIS
Date: 2023.08.17 17:02:06 -04'00'

---

**EPA Brownfields Program Officer:** James Byrne

JAMES BYRNE

Digitally signed by JAMES BYRNE
Date: 2023.08.18 06:40:25 -04'00'

---

## 2.0 Project Organization & Personnel Responsibilities

In support of the United States Environmental Protection Agency (EPA) Region 1 Targeted Brownfields Assessment (TBA) Program, the United States Department of Transportation Volpe National Transportation Systems Center (Volpe) will perform a Phase II environmental site assessment (ESA). The Volpe Project Team will consist of the Volpe Program Manager and Project Implementer with the assistance of the Volpe Quality Assurance (QA) Officer. The project team may be supplemented with support of additional Volpe scientists and engineers as needed. Personnel responsibilities for this project are included in Table 1 and will be organized as depicted in the graphic below. Project roles and organization are subject to change.

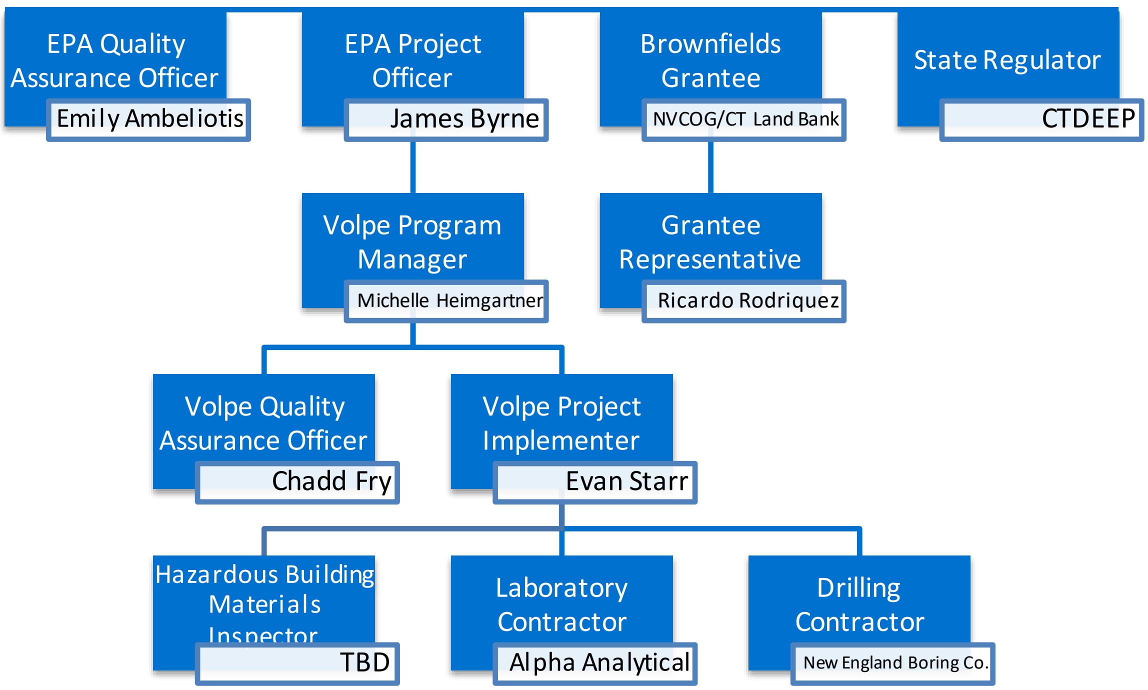



*Table 1: Personnel responsibilities*

| Role | Name | Title | Phone |
|---|---|---|---|
| EPA Project Officer | James Byrne | Brownfield Program Officer | 617-918-1389 |
| EPA QA Officer | Emily Ambeliotis | EPA QA Officer | 617-918-8348 |
| Grantee Contact | Ricardo Rodriquez | NVCOG Brownfield Project Manager | 202-982-0797 |
| Volpe Program Manager | Michelle Heimgartner | Senior Environmental Engineer | 617-494-2098 |
| Volpe Project Implementer | Evan Starr | Environmental Protection Specialist | 617-494-3974 |
| Volpe QA Officer | Chadd Fry | General Engineer | 609-330-8361 |
| Laboratory Contact | Alpha Analytical | Analytical Laboratory | 800-624-9220 |
| Drilling Contact | New England Boring Co. | Steven Garside | 603-437-1610 |

# 3.0 Problem Definition & Project Quality Objectives

## 3.1 Problem Definition

A Phase I ESA was completed in April 2023 by Volpe for the property known as the Kinneytown Dam (Subject Property), which is planned for demolition and restoration. The assessment included review of historical and environmental records associated with the Subject Property and the surrounding area, a Site reconnaissance visit, and interviews with the Subject Property manager and local officials. The Phase I assessment identified a recognized environmental condition (REC) in connection with the Subject Property from potential sediment contamination resulting from suspected historic releases of hazardous materials and/or petroleum products from upstream sources.

The purpose of the Phase II ESA is to evaluate the presence or absence of hazardous materials and petroleum products in sediment north of the dam structure and within Coe Pond, and to assess upstream and downstream background conditions. Identifying the presence or absence of these contaminants from within the vertical extent of sediment down to bedrock within the dam impoundments will help support the dam structure demolition plan and determine the feasibility of managing existing sediment build-up within the Naugatuck River. Additional environmental investigations will include the assessment of buildings or structures that potentially contain hazardous building materials.

Surface water and sediment sampling will be conducted to identify the presence or absence of a wide suite of potential contaminants of concern (COCs) identified in the Phase I ESA and in consultation with CT DEEP and EPA, which includes metals, mercury, herbicides, pesticides, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), extractable total petroleum hydrocarbons (ETPH), and per- and polyfluoroalkyl substances (PFAS) as specified in Table 2. Potential hazardous building materials will be inspected, sampled, and analyzed for asbestos-containing materials (ACM), lead-based paint (LBP), and PCB-containing materials.

## 3.2 Subject Property Description

The Subject Property is an approximately 171-acre area located between Seymour, CT and Ansonia, CT, in New Haven County, Connecticut. The Subject Property is comprised of three parcels:

- 677 South Main Street, Seymour CT, map-block-lot (MBL): 11-03-35-0, approximately 18 acres
- 769 Derby Avenue, Seymour, CT, MBL: 12-04-34-0, approximately 99 acres
- 0 Hotchkiss Terrace, Ansonia, CT, MBL: 036 0001 0003, approximately 54 acres

New Haven County is situated in southwestern Connecticut. The Subject Property topography is variable but generally slopes from higher elevations in the north to lower elevations in the south. The Naugatuck River flows north to south and runs from approximately 50 ft. above mean sea level at the main impoundment to approximately 15 ft. above mean sea level south of the main impoundment. The river flows south from Seymour, CT, to Ansonia, CT. The main dam structure is located at the following coordinates: 41.368619, -73.085845. The lower dam structure is located at: 41.353742, -73.085387 as shown on Figure 3.

The Kinneytown Dam is 28 feet high and 455 feet wide, with an estimated impoundment area of 72 acres at Unit 1. A second dam, the Canal Reservoir Dam, is 30 feet high and 60 feet wide, with an estimated impoundment area of 37 acres. The facility was designed to produce electricity via turbines in two powerhouses. The Seymour powerhouse (powerhouse 1) is adjacent to the larger upper dam. The Ansonia powerhouse (powerhouse 2) is located approximately one mile south. A canal and reservoir (known today as Coe Pond) delivered water from powerhouse 1 to powerhouse 2. Figure 1 details general location of the subject property and Figure 2 details the subject property layout.

The Subject Property consists of several areas:

- The Kinneytown Hydroelectric Dam powerhouse 1, located in Seymour, CT, has not produced power since 2020. It consists of an impoundment, spillway, sluicegate, large filtering grates, fish passage ladder, gatehouse (located on the opposite bank of the river across the impoundment), buried penstock, floating boat barrier, and the powerhouse which contains a turbine, transformer, and associated equipment.
- The Kinneytown Hydroelectric Dam powerhouse 2, which is sometimes referred to as the "old powerhouse" is located in Ansonia, CT and has not produced power since 2013. Powerhouse 2 consists of a catwalk, impoundment, spillway, and powerhouse which contains a turbine, transformer, and associated equipment. This building is in a state of disrepair.
- A manmade canal runs between the two dams to deliver water from powerhouse 1 to powerhouse 2. The gatehouse at dam 1 controls inflow (north to south) rate. There is a reservoir located along this canal to retain excess water. This reservoir is known today as Coe Pond. From Coe Pond, the canal continues south to powerhouse 2.
- Coe Pond, a manmade reservoir formed by the canal between dam 1 and 2.

A full Subject Property description with detailed information on history, uses, ownership, and features is provided in *Phase I – Environmental Site Assessment, Kinneytown Dam, Seymour, Connecticut* (Volpe, 2023b). A summary of that description is provided in this section. Please see the Phase I ESA report for additional details, figures, and records. Figures showing the Subject Property location, topography of the surrounding area, and the Subject Property layout are included as Figures 1, 2, and 3, respectively.

## Site History

The Kinneytown Dam was constructed in 1845 as a diversion dam for a downstream mill and later converted into a hydroelectric dam (unit 1) with a canal that leads to unit 2 and the canal dam downstream. Floods have twice destroyed the dam, once in 1910 and again in 1955, and it was twice rebuilt. It is currently in need of repair according to a Federal Energy Regulatory Commission (FERC) communication from 2022 and is rated as a significant hazard by CTDEEP since 2016, with an inoperable fish ladder. The dams have not been used to generate electricity for any purpose since Fall 2020. The Subject Property has remained in that condition to the present day.

## Current Ownership and Use

The Subject Property is currently owned by Trimaran Energy, LLC. and is not in use. All structures listed above are either abandoned or otherwise not in use. The fish ladder passage channel at Unit 1 is in place but is ineffective and not in use.

Metro-North Commuter Railroad, a subsidiary of MTA, holds a leasing agreement from 1984 with Arco Metals Company for wire, pipe, and cable crossings associated with the rail line adjacent to the Dam property.

**Proposed Development**

The dam is slated to be removed and the surrounding river restored.

## 3.3 Contaminants of Concern

Based on review of historical information and interviews, as well as previous limited sampling performed in the upper dam impoundment, the Phase I ESA identified potential contaminants of concern to be evaluated in sediment located in the upper and lower impoundments. This Phase II ESA will expand the focus to include a full suite of analytical methods to properly evaluate the feasibility of different sediment plans related to the future removal of the Kinneytown Dam.

Limited sediment sampling was performed in two locations within the upper dam impoundment in December 2022 and included the collection of five samples analyzed for herbicides, pesticides, polyaromatic hydrocarbons (PAHs), PCBs, SVOCs, VOCs, and metals. Laboratory analysis identified several detections exceeding National Oceanic and Atmospheric Administration (NOAA) Freshwater Sediment Screening Quick Reference Tables (SQuiRTs) and USEPA Region 3 screening benchmarks for freshwater sediment including PAHs, PCBs, SVOCs, and VOCs.

The primary rationale for broad sampling and analysis includes historical flooding that occurred within the Naugatuck Valley in 1910 and 1955, which destroyed industrial buildings upstream and may have contributed to pollutant deposition within the dam impoundments. Proposed sampling under this Phase II ESA will follow previous sampling efforts and expand methodologies to evaluate samples from within the entire impoundment area and to explore emerging contaminants, water quality, and characterize sediment. Additionally, the three building structures at the Subject Property will be inspected for hazardous building materials. A list of potential CoCs is provided in Table 2.

*Table 2: Potential Contaminants of Concern*

| Contaminant | Media | Location | Rationale |
|---|---|---|---|
| Metals | Sediment | Upper/Lower Impoundments | Unknown historical deposition from upstream sources. Detections were identified in December 2022 sampling. |
| Volatile Organic Compounds (VOCs) | Sediment | Upper/Lower Impoundments | Unknown historical deposition from upstream sources. Detections were identified in December 2022 sampling. |
| Semivolatile Organic Compounds (SVOCs) | Sediment | Upper/Lower Impoundments | Unknown historical deposition from upstream sources. Detections were identified in December 2022 sampling. |
| Petroleum | Sediment | Upper/Lower Impoundments | Unknown historical pollutant deposition from potential regional dumping or leaking of petroleum products. |
| Polychlorinated biphenyls (PCBs) | Sediment | Upper/Lower Impoundments | Unknown historical deposition from upstream sources. Detections were identified in December 2022 sampling. |

| | | | |
|---|---|---|---|
| Pesticides and Herbicides | Sediment | Upper/Lower Impoundments | Unknown historical deposition from upstream sources. Detections were identified in December 2022 sampling. |
| PFAS | Sediment | Upper/Lower Impoundments | Evaluate potential presence of emerging contaminants. |
| Total Organic Carbon, grain size distribution, organic content, moisture content, percent solids, pH. | Sediment | Upper/Lower Impoundments | Perform physical characterization of sediment. |
| Asbestos-containing materials (ACM) | Building materials | Suspect building structures | Conduct hazardous building materials inspection, including sampling, to identify presence or absence of ACM as part of demolition planning. |
| Lead-Based Paint (LBP) | Building materials | Suspect building structures | Conduct hazardous building materials inspection, including sampling, to identify presence or absence of LBP as part of demolition planning. |
| PCB-containing materials | Building materials | Suspect building structures | Conduct hazardous building materials inspection, including sampling, to identify presence or absence of PCB-containing materials as part of demolition planning. |

## 3.4 Tasks to be Performed

The Phase II ESA investigation will be comprised of the following tasks, which shall be conducted in accordance with the *Volpe Brownfields Generic QAPP* (Volpe, 2023a) and applicable Volpe Standard Operating Procedures (SOPs). A schedule for these tasks is provided in Section 4.

- Field documentation will include a list of each sample ID, date, time and depth of collection, weather conditions, any evidence of odors or soil staining, and general physical characteristics. Sediment sample locations will be measured between each other and located with a hand-held GPS. Additionally, photographs will document each sediment core interval and sample location.
- Hazardous Building Materials Inspections – A CT-certified asbestos building inspector will perform a sampling survey of hazardous building materials at three Subject Property structures: Unit 1 powerhouse, Unit 1 canal gatehouse, and Unit 2 powerhouse. Building inspections will be performed in accordance with Volpe SOP-024 Hazardous Building Materials Survey. See Section 3.5 for additional information.
- Equipment Mobilization – A drilling contractor will utilize a crane to lift and place a barge with drilling equipment into impoundment 1, from the location of the Unit 1 Powerhouse parking lot. Following completion of sediment sampling from within impoundment 1, the drilling barge will be relocated to Coe Pond for sediment sampling. Additional upstream and downstream background sample locations will need to be identified and coordinated through project sponsors – please see section 3.6 for additional details.
- Sediment Boring Advancement – A drilling contractor shall advance a minimum of thirty sediment borings in accordance with EPA *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual* (2001). Borings shall be advanced to bedrock or refusal (anticipated depth of 15-20 feet below sediment surface). Surface water is

anticipated to be less than 10 ft. deep, and likely shallow throughout most of the impoundments. Borings shall be located as described in Section 3.5.

- Sediment Sample Collection – Sediment samples shall be collected from each of the completed sediment borings, excluding shallow refusals, for the parameters described in Section 3.6. Refusal from the anticipated historic flood layer of 2-4 ft. below surface bed is considered shallow refusal. A table of proposed sediment samples is included in Section 5. Samples shall be screened and collected in accordance with EPA *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual* (2001), Volpe SOP-003 Description and Identification of Soils, SOP-004 Soil Headspace Screening, SOP-008 Split-Spoon/Spilt-Barrel Sampling, Volpe SOP-018 Field Sampling Equipment Decontamination, and SOP-005 Surficial Soil Sediment and Sludge Sampling.

- Surface Water Sampling – Surface water will be analyzed for physical characteristics including depth to sediment, turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential. Surface water will be collected in accordance with Volpe SOP-016 Surface Water Sampling.

- Sediment Sample Analysis – Sediment samples shall be handled in accordance with Volpe SOP-019 Sample Labeling, Packaging, and Shipping. Samples will be sent to Alpha Analytical for laboratory analysis.

- Equipment Demobilization – Following sample collection, equipment shall be appropriately removed from the Subject Property. Waste shall be handled in accordance with Volpe SOP-020 Management of Investigation Derived Waste.

- Data QA and Analysis – Volpe will request a Level II data package for all sample data. Data received from the laboratory shall undergo the QA/QC process as described in the *Volpe Brownfields Generic QAPP* and will be reviewed by the Volpe QA Manager. Laboratory analytical results shall be compared to the regulatory standards discussed in Section 3.8 and used to inform the decision statement provided in Section 3.9. Additionally, sediment data with low percent solids will be qualified as detailed in Section 5.2.

- Reporting – The sampling investigation activities, findings, recommendations shall be summarized in a Phase II ESA Report, that will include relevant data tables, figures, and analytical reports. The report will be submitted to the EPA Project Officer and shared with the grantee to inform future steps for the Subject Property. Data reporting is further discussed in Section 11.

## 3.5 Hazardous Building Materials Inspections

All structures at the subject property, including the Unit 1 Powerhouse, canal gatehouse, and Unit 2 powerhouse, will be inspected, sampled, and evaluated for the absence or presence of hazardous building materials. This can include but is not limited to asbestos-containing materials, lead-based paints, and PCB-containing materials. See Table 3 for regulatory criteria to be followed. All asbestos inspections will be conducted in accordance with Volpe SOP-024 and The Asbestos Hazard Emergency Response Act (AHERA). Sampling collection procedures are detailed in the SOP.

## 3.6 Sampling Locations and Rationale

Sediment sampling will be collected from a minimum of twenty (20) sample locations from within the upper dam impoundment area, with three (3) additional sample locations collected upstream and north of the impoundment area as background samples. Sample locations are shown in Figure 4 but are subject to change, with the approval of the Volpe Project Implementer, based on site conditions. Table 6 includes a table of proposed sample locations. The background sample location will be identified following coordination and access considerations with project personnel, EPA, and NVCOG.

An additional ten (10) sample locations will be collected from within Coe Pond and the lower dam impoundment area, as shown on Figure 4, with three (3) additional background samples collected from a downstream location following access considerations.

Utilizing a barge-mounted mechanical drill, each sample location will consist of deploying a sediment core sampler down to bedrock and/or refusal. Anticipated depths of sediment cores will vary across the impoundment areas due to changes in river topography and sediment build-up. Sediment thickness may vary from several feet near the northern boundary of the upper impoundment to 15+ feet closer to the upper dam structure. If shallow refusal is encountered above bedrock due to the presence of debris or other materials, a new sampling location and sampling core shall be established in the near vicinity and confirmed by on-site personnel, within a 10-ft. radius of the original location. The historic flood layer 2-4 ft. below the surface bed is considered shallow refusal. Vibracore sampling is not recommended due to potential for false refusal from buried building debris associated with historic flood layers.

At each sample location, cores will be deployed and collected so that each sampled interval is representative of various depths of the sediment column. For example, two to four sample intervals are anticipated at each sample location, depending on total depth: a surficial sediment interval representative of material above the historic "flood layer," one sample interval from the historic flood layer (anticipated to be located two to six feet below the sediment surface), and a bottom sample interval located above core refusal or bedrock representing the bottom depth of the sediment column. Additionally, a fourth sample interval may be collected depending on field conditions at the time of sampling activities, e.g., visual, olfactory, or anomalous PID detections, etc.

Due to the volume requirement for proposed sampling methods, and limited volume collected from sediment cores, repetitive sampling at each sample location might be required to obtain the desired quantity of material from a given depth. Large-diameter cores will be recommended and will be confirmed with drilling operators and documented in this SSQAPP to minimize repeat cores.

## 3.7 Sampling Media and Parameters

Sampling collection methods will consist of compositing samples from within each sediment core interval, with the exception of volatiles which will be collected directly from a core immediately following retrieval. Sample cores will be field screened for VOCs by photoionization detector (PID) and highest-detected readings will be targeted for sample collection, from within each sample interval. Where the PID does not detect any VOCs, subsamples should be obtained representing all visually different areas of the core or sediment column. Composite samples will be collected from homogenous layers as best as possible from within each sample interval. VOC samples will be collected in accordance with *CTDEEP Guidance for Collecting and Preserving Soil and Sediment Samples for Laboratory Determination of Volatile Organic Compounds.*

Per CT DEEP, PFAS will be sampled in accordance with New York State Department of Conservation (NYSDEC) *Sampling, Analysis, and Assessment of PFAS* (April 2023).

Table 6 includes a list of proposed samples and their locations.

Sediment will be analyzed for the following parameters:

- Sediment description/classification and physical characteristics including total organic carbon, grain size distribution analysis, organic content, moisture content, percent solids, and pH
- Field screened for VOCs by photoionization detector (PID)
- Laboratory analysis of metals, VOCs, SVOCs, PCBs, petroleum, pesticide, herbicide, and PFAS concentrations

Surface water will be analyzed for the following parameters:

- Depth
- Turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential

## 3.8 Regulatory Standards

Analytical results shall be compared to CT DEEP freshwater and Residential Direct Exposure Criteria (DEC) and the NOAA Sediment Probable and Threshold Effect Concentration (PEC & TEC) Criteria for Freshwater or Marine environments (MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines (SQG) for Freshwater Ecosystems Archives of Environmental Contamination and Toxicology 7 39, pp 20-31). NOAA SQG guidelines have been established in two-tiers: Threshold Effect Concentration or Level (TEC or TEL) and Probable Effect Concentration or Level (PEC or PEL). Additionally, as established by EPA Region 4 in the Ecological Risk Assessment Supplemental Guidance, Ecological Screening Values (ESVs) and Refinement Screening Values (RSVs) for freshwater sediment will be considered. These guidelines are not intended to serve as site-specific clean-up levels but will be used in the decision-making process regarding future plans.

The applicable CT Water Quality Standards, 22a-426-1 *et seq.*, will be used to evaluate the surface water characterization.

### Sediment Standards

The NOAA SQG guidelines (MacDonald 2000) presents screening concentrations for inorganic and organic contaminants in various environmental media. To screen for substances which may threaten natural resources of concern to NOAA, laboratory analytical concentrations can be compared to these screening levels. Freshwater TEC (FTEC) and freshwater PEC (FPEC) values will be included for comparison. The ESVs and RSVs provided by EPA Region 4 guidance represent a preliminary screening of site chemical concentrations to assist in evaluating the need to conduct further investigations at the site; ESVs are not recommended as remediation levels. Exceedance of the ESVs may indicate the need for further evaluation of potential ecological risks on site. CT DEEP Remediation Standard Regulations - Residential Direct Exposure Criteria for soil (CT-RCS) will also be utilized as an additional screening value for planning purposes, however, CT-RCS is not applicable to sediment. If sediment were to be dredged and drained in the future, CT-RCS could become applicable. CT-RCS conditions are detailed in Connecticut Agencies Regs. Section 22a-133k-2. Table 4 below summarizes these categories.

***Table 3: Hazardous Building Materials Criteria***

| Category | Criteria | Applicable to the Subject Property? |
|---|---|---|
| National Emission Standards for Hazardous Air Pollutants (NESHAP) | ACM is a material that contains greater than 1% asbestos. | In accordance with EPA and NESHAP, buildings that will be demolished shall be inspected and sampled for potential ACM. In accordance with CT Department of Public Health and CT rules section 19a-332a-2 and 3, asbestos notification and abatement will be required depending on ACM quantity. |
| EPA | LBP is paint that contains lead at concentrations greater than or equal to 0.5% by weight, or 5,000 mg/kg. | If LBP is identified, potential abatement may be required prior to demolition activities unless proposed disposal facilities will accept with comingled waste. |
| EPA and Toxic Substances Control Act (TSCA) | A material that contains PCBs at greater than or equal to 50 parts mg/kg by weight. | If manufactured PCB products containing PCBs ≥ 50 mg/kg are found in a building or other structure, they must be removed and disposed of as PCB bulk product waste in accordance with 40 CFR section 761.62. |

***Table 4: Sediment Categories of Screening Values***

| Category | Criteria | Applicable to the Subject Property? |
|---|---|---|
| NOAA FPEC | Can be used as predictors of sediment toxicity. Probable Effect Concentration is the concentration above which harmful effects are likely to be observed. | Exceedance of SQGs may indicate the need for further site assessment, depending on potential biological impacts, sample location and depth. |
| NOAA FTEC | Threshold Effect Concentration is the concentration of a hazardous substance in sediment below which adverse effects on sediment-dwelling organisms are unlikely to occur. | Exceedance of SQGs may indicate the need for further site assessment, depending on potential biological impacts, sample location and depth. |
| EPA Region 4 ESVs and RSVs | The ESVs and RSVs represent a preliminary screening of site chemical concentrations to assist in evaluating the need to conduct further investigations at the site; ESVs are not recommended as remediation levels. | Exceedance of the ESVs may indicate the need for further evaluation of potential ecological risks on site. |
| CT-RCS | Direct Exposure Criteria are established to protect human health from exposure to contaminants in soil. With some exceptions, these criteria apply to soil | No. Sediment is not subject to residential soil cleanup standards in CT. However, potential future use of sediment at the Subject Property could qualify applicability. Generally, the most stringent |

| | | |
|---|---|---|
| | located within fifteen feet of the ground surface. Polluted soil must be remediated to a concentration that is consistent with the Residential Direct Exposure Criteria, unless the site is used exclusively for industrial or commercial purposes. | cleanup standard and may be used as a conservative threshold for human health risk. |

## 3.9 Decision Statement

Future planning for the Subject Property includes demolition of dam structures and sediment management, which may include passive release downstream, dredging for off-site disposal, or dredging for downstream in-situ capping. The findings of the Phase II investigation will help inform future sediment management. Based on this investigation, the following decision statements will be applied:

- Sediment is not subject to CT residential direct criteria for soil cleanup standards; however, sediment sampling concentrations will be compared to CT-RCS to help inform future sediment management options. If all sampling data is below the regulatory standards described above, then various dredging options may be considered in future planning.
- Compare sediment contaminant concentrations with NOAA concentrations and EPA Region 4 ESV/RSVs.
    - evaluate the quantity, quality, and analytical characteristics of the data
    - evaluate the vertical and horizontal (depth) distribution of the data
    - determine biological receptors likely to be exposed
    - identify contaminants with detection concentrations above screening levels and regulatory standards and the magnitude of exceedances.
- NOAA freshwater PEC/TEC and EPA ESV/RSVs will be used as benchmark screening thresholds. Exceedance of these values may indicate the need for further site assessment and/or risk characterization.
    - If sediment concentrations are consistent with or below background levels, sediment contamination is not likely to be present within the impoundments.
    - If all contaminants are below threshold effect concentrations (TECs) and no other site information indicates the presence of adverse effects, low priority for further action may be appropriate (all available chemical, physical and biological information should be reviewed prior to dismissing need for further evaluation of biological effects)
    - If sediment concentrations exceed one of the recommended screening thresholds but not CT-RCS standards, further investigations may be necessary to fully delineate the vertical and horizontal extent of contaminants of concern within the impacted areas.
    - If threshold effects concentrations (TECs) are exceeded but probable effects concentrations (PECs) are not, it is likely that further site assessment in the form of biological community assessments, toxicity testing or both will be required.
    - Considering that NOAA freshwater PEC/TEC and EPA ESV/RSVs are more conservative than CT RCS soil standards, if concentrations exceed all, further investigations/cleanup remedies may be necessary.

- If hazardous building materials are identified within the Subject Property, demolition planning will require potential abatement or hazardous waste characterization.

# 4.0 Project Timeline

Volpe will complete the Phase II ESA based on the schedule provided in Table 5 below. The schedule is subject to change.

*Table 5: Project Timeline*

| Activity | Duration (business days) |
|---|---|
| Volpe preparation of SSQAPP | 15 |
| EPA review of SSQAPP | 30 |
| Volpe prepares SOW for laboratory and drilling contract support | 5 |
| Volpe contracts laboratory and drilling support | 30 |
| Drilling contractor prepares work plan and health and safety plan | 15 |
| Volpe and EPA schedule field work | 10 |
| Conduct field work (mobilization with crane and drilling barge, perform drilling, sample collection). In parallel, perform hazardous building materials inspections. | 5-10 |
| Laboratory analysis | 10 |
| Data QA review and report preparation | 20 |

# 5.0 Sampling and Analytical Requirements

## 5.1 Sample Collection

A summary of all samples to be collected and analyzed during the Phase II ESA is provided in Table 6 below. Sample locations and depths are subject to change based on site conditions.

*Table 6: Sample Summary*

| Location | Easting | Northing | Sample ID | Sample Depth - Below Sediment Surface (bss) | Laboratory Analysis |
|---|---|---|---|---|---|
| | | | **Sediment** | | |
| KTD-IMP-SED-101 | 907886.6 | 695494.2 | KTD-IMP-SED-101A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-101B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-101C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-101D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-102 | 908118.3 | 695488.2 | KTD-IMP-SED-102A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-102B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-102C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-102D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-103 | 908363.4 | 695999.1 | KTD-IMP-SED-103A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-103B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-103C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-103D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-104 | 908131.8 | 696005.1 | KTD-IMP-SED-104A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-104B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-104C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-104D | highest PID reading | Full list in Table 7 |

| Location | Easting | Northing | Sample ID | Sample Depth - Below Sediment Surface (bss) | Laboratory Analysis |
|---|---|---|---|---|---|
| KTD-IMP-SED-105 | 908376.9 | 696516.1 | KTD-IMP-SED-105A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-105B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-105C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-105D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-106 | 908608.6 | 696510.0 | KTD-IMP-SED-106A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-106B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-106C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-106D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-107 | 908738.5 | 697051.3 | KTD-IMP-SED-107A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-107B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-107C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-107D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-108 | 908506.0 | 697024.5 | KTD-IMP-SED-108A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-108B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-108C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-108D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-109 | 908750.1 | 697497.1 | KTD-IMP-SED-109A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-109B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-109C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-109D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-110 | 908984.2 | 697584.8 | KTD-IMP-SED-110A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-110B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-110C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-110D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-111 | 908996.9 | 698073.7 | KTD-IMP-SED-111A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-111B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-111C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-111D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-112 | 909229.7 | 698111.5 | KTD-IMP-SED-112A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-112B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-112C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-112D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-113 | 909143.8 | 698422.8 | KTD-IMP-SED-113A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-113B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-113C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-113D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-114 | 909359.4 | 698641.9 | KTD-IMP-SED-114A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-114B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-114C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-114D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-115 | 909402.2 | 699021.0 | KTD-IMP-SED-115A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-115B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-115C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-115D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-116 | 909638.6 | 699195.7 | KTD-IMP-SED-116A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-116B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-116C | 6 in. above bedrock/refusal | Full list in Table 7 |

| Location | Easting | Northing | Sample ID | Sample Depth - Below Sediment Surface (bss) | Laboratory Analysis |
|---|---|---|---|---|---|
| | | | KTD-IMP-SED-116D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-117 | 909665.1 | 699586.3 | KTD-IMP-SED-117A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-117B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-117C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-117D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-118 | 909873.7 | 699745.3 | KTD-IMP-SED-118A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-118B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-118C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-118D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-119 | 910063.8 | 700246.7 | KTD-IMP-SED-119A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-119B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-119C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-119D | highest PID reading | Full list in Table 7 |
| KTD-IMP-SED-120 | 910312.4 | 700758.0 | KTD-IMP-SED-120A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-120B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-IMP-SED-120C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-IMP-SED-120D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-101 | 907694.1 | 689564.0 | KTD-COE-SED-101A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-101B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-101C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-101D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-102 | 907835.1 | 690153.9 | KTD-COE-SED-102A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-102B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-102C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-102D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-103 | 907655.8 | 690646.3 | KTD-COE-SED-103A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-103B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-103C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-103D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-104 | 907084.2 | 691190.3 | KTD-COE-SED-104A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-104B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-104C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-104D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-105 | 907423.4 | 691181.5 | KTD-COE-SED-105A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-105B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-105C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-105D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-106 | 907823.3 | 691187.6 | KTD-COE-SED-106A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-106B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-106C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-106D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-107 | 907731.9 | 691664.3 | KTD-COE-SED-107A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-107B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-107C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-107D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-108 | 907268.7 | 691758.6 | KTD-COE-SED-108A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-108B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-108C | 6 in. above bedrock/refusal | Full list in Table 7 |

| Location | Easting | Northing | Sample ID | Sample Depth - Below Sediment Surface (bss) | Laboratory Analysis |
|---|---|---|---|---|---|
| | | | KTD-COE-SED-108D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-109 | 906759.9 | 691771.8 | KTD-COE-SED-109A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-109B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-109C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-109D | highest PID reading | Full list in Table 7 |
| KTD-COE-SED-110 | 906734.8 | 692285.1 | KTD-COE-SED-110A | 0-3 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-110B | Flood layer, or 2-6 ft. bss | Full list in Table 7 |
| | | | KTD-COE-SED-110C | 6 in. above bedrock/refusal | Full list in Table 7 |
| | | | KTD-COE-SED-110D | highest PID reading | Full list in Table 7 |

1. Location easting and northing are based on the North American Datum 1983 StatePlane Connecticut FIPS 2001 (US Feet) Projected Coordinate System.
2. The number of interval samples per location may change depending on variable field conditions (depth of sediment within different areas of impoundment).
3. One additional background sample will be collected from each of the upstream and downstream impoundment locations, outside of the Subject Property.
4. Quality control samples in addition to the samples listed in this table will be collected and are listed in Table 10.

Secondary data to be collected in the field includes:

- Sediment descriptions and classifications which will be recorded in the field notebook to document soil characteristics.
- PID readings which will be used on individual soil samples and the soil cores to screen for volatizes in the soil. Readings will be recorded in the Volpe Boring and Well Construction Log.
- Surface water quality measurements including turbidity, dissolved oxygen, specific conductance, temperature, and pH.
- Total depth of sediment.

## 5.2 Sample Analysis

Sediment samples will be analyzed for the parameters listed below in Table 7. Quality control (QC) samples are not included in this table (please see Table 10). The laboratory SOPs for each analysis are listed in Table 8. Copies of the laboratory SOPs are provided in the *Volpe Brownfields Generic QAPP*.

A complete list of analytes to be included for each parameter is provided in Appendix A. The list includes the laboratory reporting limits as well as the regulatory standards for each analyte as described in Section 3.7 of this SSQAPP. For analytes whose listed laboratory reportable detection limit (RDL) is greater than the strictest applicable regulatory standard, Volpe will coordinate with the lab to determine if lower RDLs are achievable. If they are not, a "J"-qualified estimated concentration that is less than the RDL but greater than the analyte's method detection limit will be evaluated. If reliable chemical concentrations still cannot be achieved, then the need for resampling will be discussed on a case-by-case basis with the EPA Program Officer.

In accordance with EPA Region 1 *Memorandum on Qualifying Soil/Sediment Data with low Percent Solids* (EPA 1990), soil data will be accepted when the percent solids are greater than 30%. A "J"-qualified result will be added when positive results include percent solids 10% or greater and less than or equal to 30%. All positive results are to be rejected when percent solids are less than 10%. All non-detected results are to be rejected when percent solids are less than or equal to 30%.

*Table 7: Analytical Summary*

| Parameter | # of Samples* | Analysis Method | Container | Preservative | Holding Time |
|---|---|---|---|---|---|
| | | | Sediment | | |
| CT15 Metals | 120 | EPA 6010D | 1 Plastic container or 1 x 4 oz. glass jar | Cool to 4˚C | 180 days |
| Mercury | 120 | EPA 7471B | 1 Plastic container or 1 x 4 oz. glass jar | Cool to 4˚C | 28 days |
| Chromium VI (contingency analysis if speciation is required) | 120 | EPA 3060 | 1 Plastic container or 1 x 4 oz. glass jar | Cool to 4˚C | 30 days |
| RCP VOCs low-level | 120 | EPA 8260 | 3 x 40 mL glass Teflon lined vials; 1 x 2oz. jar for percent moisture | 1 Vial with 5 mL Methanol; 2 Vials with 5 mL water or sodium bisulfate solution, Cool to 4˚C | 14 days |
| RCP SVOCs | 120 | EPA 8270 | 1 x 8 oz. amber glass jar | Cool to 4˚C | 14 days |
| CT ETPH | 120 | CT ETPH | 1 x 8 oz. glass jar with Teflon-lined lids | Cool to 4˚C | 14 days |
| PCBs | 120 | EPA 8082 | 1 x 8 oz. amber glass jar | Cool to 4˚C | 365 days extract, 40 days analyze |
| Pesticides | 120 | EPA 8081B | 1 x 8 oz. amber glass jar | Cool to 4˚C | 14 days |
| Herbicides | 120 | EPA 8151A | 1 x 8 oz. glass jar with | Cool to 4˚C | 14 days |
| PFAS | 120 | EPA 1633 | Polypropylene containers | Cool to 4˚C | 14 days |
| Physical characterization: Total Solids, Organic Carbon, Grain-size distribution, Organic Content | | | | | |

* Total number of samples should not exceed. Actual number of interval samples per location may change depending on variable field conditions (depth of sediment within different areas of impoundment).

*Table 8: Alpha Analytical Laboratory SOP References*

| Lab SOP | Title | Reference Method | Version/Date |
|---|---|---|---|
| 32639 | Volatile Organic Compounds by GC/MS | EPA 8260D | 8, 11/08/2022 |
| 31162 | Semivolatile Organic Compounds by GC/MS | EPA 8270E | 2, 04/29/2021 |
| 2116 | Organochlorine Pesticides By Capillary Column GC | EPA 8081B | 10, 11/08/2022 |
| 2128 | Analysis of Chlorinated Herbicides by GC Using Methylation Derivatization | EPA 8151A | 9, 01/05/2022 |
| 2129 | PCBs By Capillary Column GC | EPA 8082A | 12, 11/08/2022 |
| 26796 | Inductively Coupled Plasma - Atomic Emission Spectrometry | EPA 6010D | 3, 07/08/2022 |
| 25924 | Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique) | EPA 7471B | 4, 07/07/2022 |
| 2204 | Chromium, Hexavalent | EPA 3060A | 10, 01/06/2022 |
| 2127 | Extractable Total Petroleum Hydrocarbons CT-ETPH | CT EPTH | 8, 12/6/2022 |
| 45852 | Method 1633 PFAS in Aqueous, Solid, Biosolids and Tissue by LCMSMS | EPA 1633 | 3, 09/29/2022 |

## 6.0 Project Specific SOP References

Volpe SOPs that are to be utilized in the field during the Phase II ESA are listed in Table 9 below. Copies of these SOPs are attached to the *Volpe Brownfields Generic QAPP*. SOP-024 is currently pending review to be added to the Generic QAPP but will be included in the SOPs appendix.

*Table 9: Project Specific SOP References*

| Volpe SOP | Title | Version/Date |
|---|---|---|
| SOP-001 | Field Notebook Use | 1.0, 01/09/23 |
| SOP-002 | Site Access and Utility Clearance | 1.0, 01/09/23 |
| SOP-003 | Description and Identification of Soils | 1.0, 01/09/23 |
| SOP-004 | Soil Headspace Screening | 1.0, 01/09/23 |
| SOP-005 | Surficial Soil Sediment and Sludge Sampling | 1.0, 01/09/23 |
| SOP-008 | Split-Spoon/Split-Barrel Sampling | 1.0, 01/09/23 |
| SOP-009 | Field Preservation of VOA Soil and Sediment Samples | 1.0, 01/09/23 |
| SOP-010 | Direct Push Technique Drilling | 1.0, 01/09/23 |
| SOP-011 | Hallow Stem Auger Drilling | 1.0, 01/09/23 |
| SOP-013 | Monitoring Well and Piezometer Installation | 1.0, 01/09/23 |
| SOP-015 | Low-Flow Groundwater Sampling and Groundwater Level Measuring | 1.0, 01/09/23 |
| SOP-016 | Surface Water Sampling. | 1.0, 01/09/23 |
| SOP-018 | Field Sampling Equipment Decontamination | 1.0, 01/09/23 |
| SOP-019 | Sample Labeling, Packaging, and Shipping | 1.0, 01/09/23 |
| SOP-020 | Management of Investigation Derived Waste | 1.0, 01/09/23 |
| SOP-024 | Hazardous Building Materials Inspections | 1.0, 06/09/23 |

## 7.0 Field Equipment Calibration & Corrective Action

The PID meter and the water quality meter will need to be calibrated in the field according to the manufacturer specifications. Frequency and procedures for field calibration of these instruments is explained in Volpe SOP-004 Soil Headspace Screening and SOP-015 Low-Flow Groundwater Sampling and Groundwater Level Measuring. Field equipment calibration and corrective action is further discussed in the *Volpe Generic Brownfields QAPP*.

## 8.0 Laboratory Equipment Calibration & Corrective Action

The laboratory equipment calibration procedures are handled by the individual laboratories. Individual method calibration procedures are included in the *Volpe Generic Brownfields QAPP*.

## 9.0 Sampling Handling and Custody Requirements

The Volpe Project Implementer will be responsible for sample handling. The procedures for handling samples including labeling, shipping and chain of custody information are included in Volpe SOP-019 Sample Labeling, Packaging, and Shipping. An example chain-of-custody form, sample label, and custody seal are provided in the *Volpe Generic Brownfields QAPP*.

## 10.0 Field and Analytical Laboratory Quality Control Summary

The list of quality control samples to be collected is provided in Table 10 below.

*Table 10: Field Quality Control Samples*

| Sample Type | Frequency | Est. Num. | Acceptance Criteria | Corrective Action |
|---|---|---|---|---|
| Cooler Temperature Blank | One per cooler, per shipment | 6 | 4°C +/- 2°C | Resample, and/or qualify data. |
| Trip Blank | One per cooler for aqueous VOCs | 6 | No detectable concentrations > RL | Resample, and/or qualify data. |
| Field Duplicate | One per 20 samples per matrix and parameter | 60 | RPD ≤ 50% for soil samples >5x RL.<br>RPD ≤ 30% for aqueous samples >5x RL. | Review laboratory precision, sampling consistency, and qualify data. |
| Matrix Spike/ Matrix Spike Duplicate | One per 20 samples per matrix and parameter | 60 | Review laboratory method limits (Generic QAPP App. B). | Reanalyze and/or qualify data. |
| Equipment Blank[1] | One per day per matrix, equipment used, and parameter | 10 per day | No detectable concentrations >RL | Resample, and/or qualify data. |

1. Equipment blanks will only be collected where dedicated/disposable equipment is not available.

Acceptance criteria and corrective actions for field quality control samples – as well as laboratory QC samples – are explained in the *Volpe Generic Brownfields QAPP*.

## 11.0 Data Management & Project Reports

Field notebooks, Volpe Boring and Well Construction Logs, Volpe Low-Flow Sampling Logs, and copies of the chain-of-custody will be scanned and uploaded to the Volpe Project Network. The Level II data package will be similarly uploaded once it is received.

The sampling investigation activities, findings, recommendations shall be summarized in a Phase II ESA Report, that will include relevant data tables, figures, and analytical reports. The report will be submitted to the EPA Project Officer and shared with the grantee to inform future steps for the Subject Property. Data management and documentation is further discussed in the *Volpe Generic Brownfields QAPP*.

## 12.0 Assessment and Oversight

Field oversight will be conducted by the Volpe Project Implementer, who will remain in at least daily contact with the Volpe Program Manager. Contact information for project personnel is provided in Section 2 of this SSQAPP. Procedures for assessment, response, and corrective action activities are described in the *Volpe Generic Brownfields QAPP*.

## 13.0 Data Review

Data validation and usability for both field and laboratory data are described in the *Volpe Generic Brownfields QAPP*. As detailed in Section 5.2, laboratory data will be qualified for sediment results with low percent solids (less than or equal to 30%). No deviations or additions to the generic data review process are anticipated for this project.

## 14.0 References

CTDEEP. (2005). *Rationale for Preservation of Soil and Sediment Samples for Determination of Volatile Organic Compounds.* Retrieved from https://portal.ct.gov/-/media/DEEP/site_clean_up/guidance/PreservationofSoilandSedimentpdf.pdf.

CTDEEP. (2006). *Guidance for Collecting and Preserving Soil and Sediment Samples for Laboratory Determination of Volatile Organic Compounds*. Retrieved from https://portal.ct.gov/DEEP/Remediation--Site-Clean-Up/Guidance/Soil-Preservation-Guidance-for-VOCs.

CTDEEP. (2015). *Connecticdut Water Quality Standards §§ 22a-426-1—22a-426-9.* Regulations of Connecticut State Agencies. Title 22a. Department of Energy and Environmental Protection. Retrieved from: https://portal.ct.gov/-media/DEEP/water/water_quality_standards/wqsfinaladopted22511pdf.pdf

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 7 39, pp 20-31. Retrieved from: https://semspub.epa.gov/work/07/40168746.pdf.

MassDEP. (1995). *Interim Policy for Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills*. Retrieved from: https://www.mass.gov/guides/interim-policy-comm-94-007-dredged-sediment-reuse-or-disposal.

NYSDEC. (2023). *Sampling, Analysis, and Assessment of PFAS.* New York State Department of Conservation (NYSDEC). Retrieved from: https://www.dec.ny.gov/docs/remediation_hudson_pdf/pfassampanaly.pdf.

USEPA. (1985). *Sediment Sampling Quality Assurance User's Guide*. U.S. Environmental Protection Agency, Washington, D.C., EPA/600/4-85/048.

USEPA. (2001). *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual.* Retrieved from: https://www.epa.gov/ocean-dumping/methods-collection-storage-and-manipulation-sediments-chemical-and-toxicological .

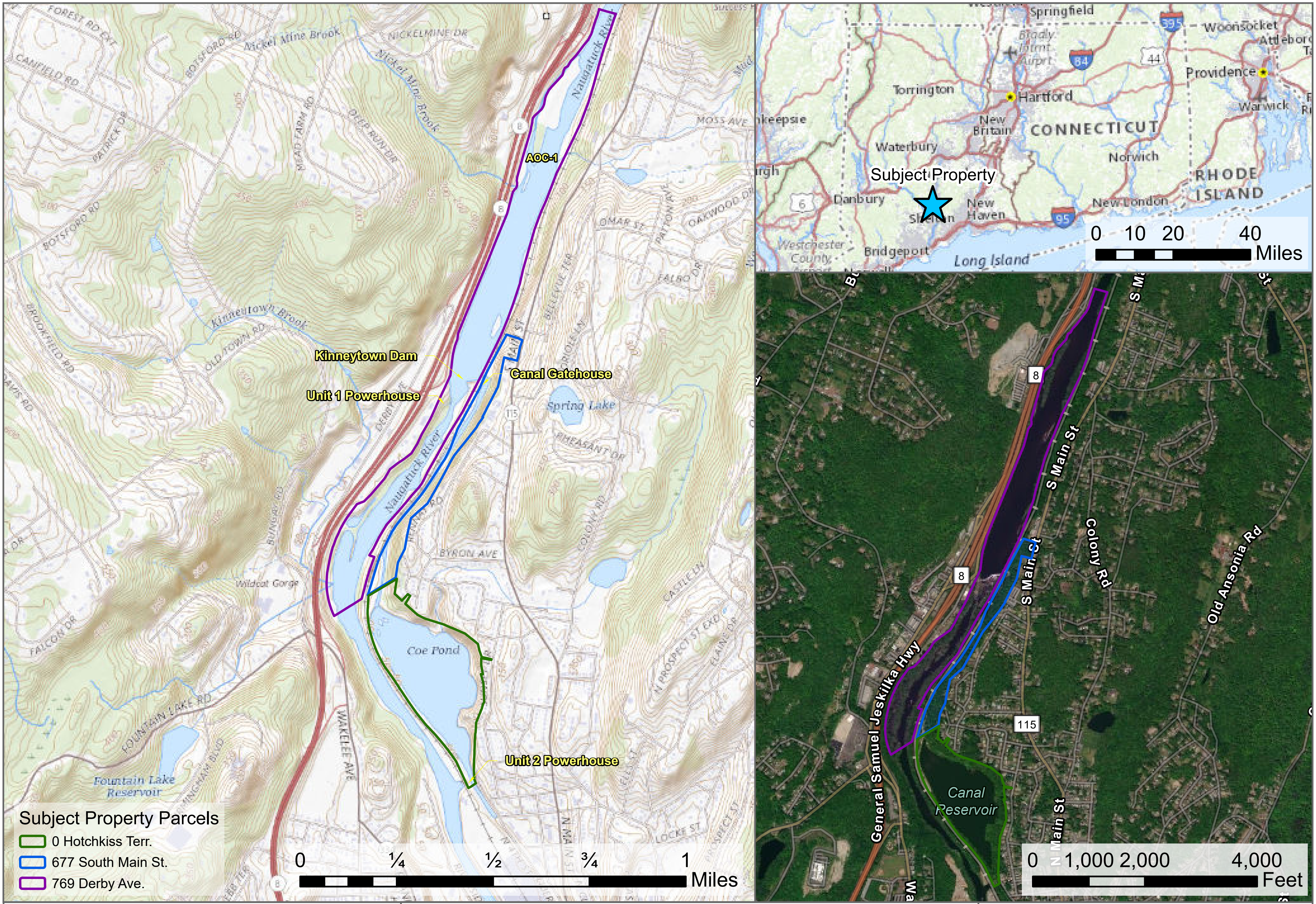
USEPA. (2018). *Region 4 Ecological Risk Assessment Supplemental Guidance.* Scientific Support Section, Superfund Division, EPA Region 4. Retrieved from: https://www.epa.gov/risk/regional-ecological-risk-assessment-era-supplemental-guidance.

VTDEC. (2015). *Vermont Watershed Management Division's Recommended Guidelines for Evaluating Contaminant Concentrations in Freshwater Sediments and the Potential for those Contaminants* *to Adversely Affect Aquatic Biota.* Vermont Department of Environmental Conservation. Retrieved from: https://dec.vermont.gov/sites/dec/files/wmp/Sites/sediment.evaluation.pdf.

Volpe. (2023a). Brownfields Generic Quality Assurance Project Plan. Cambridge, MA: U.S. DOT Volpe National Transporation Systems Center.

Volpe. (2023b). Phase I – Environmental Site Assessment, Kinneytown Dam, Seymour, Connecticut. Cambridge, MA: U.S. DOT Volpe National Transporation Systems Center.

# Figures



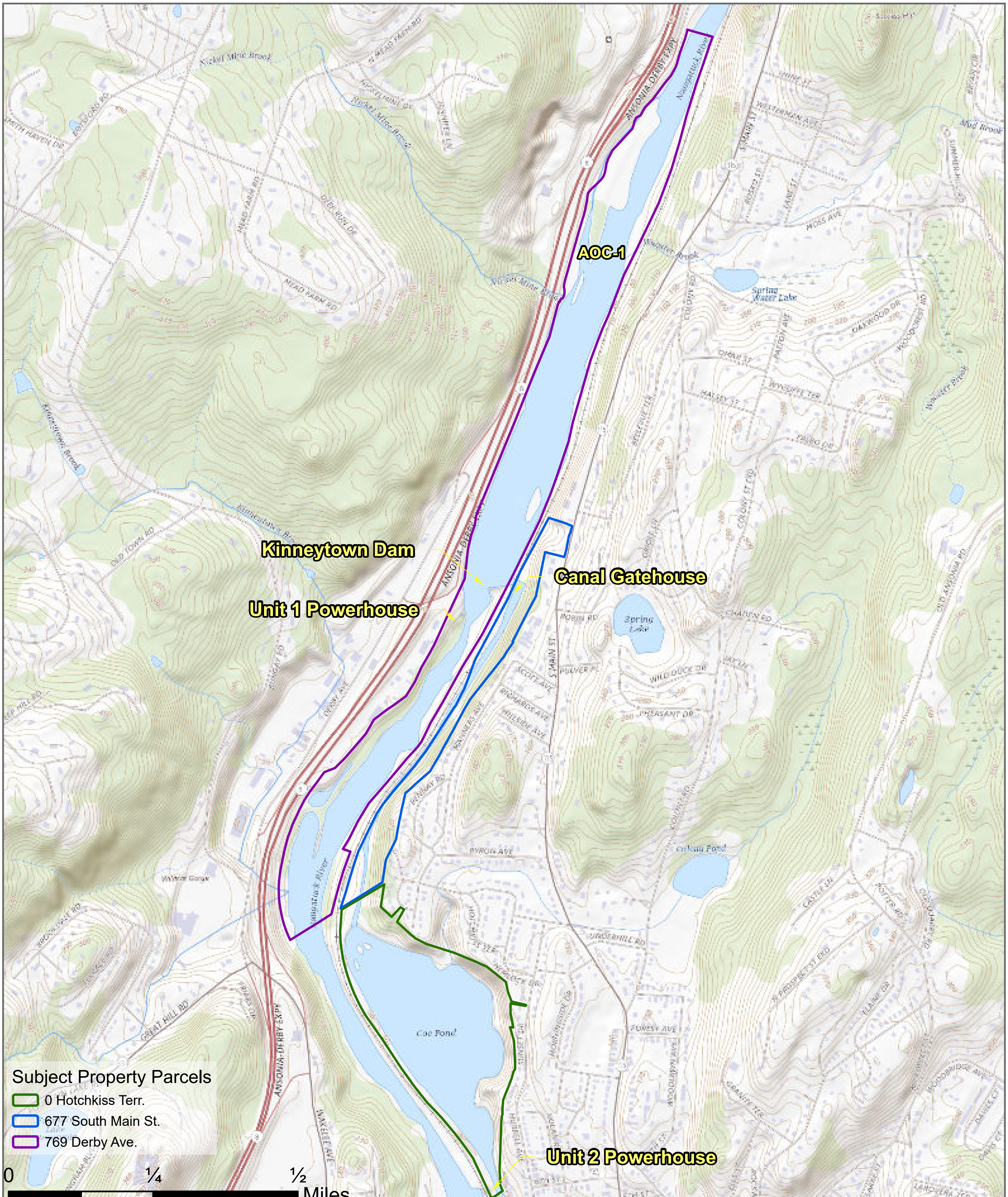

U.S. Department of Transportation
Volpe Center

Site Coordinates: 41.368713, -73.085235
January 2023

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed April, 2023.

N

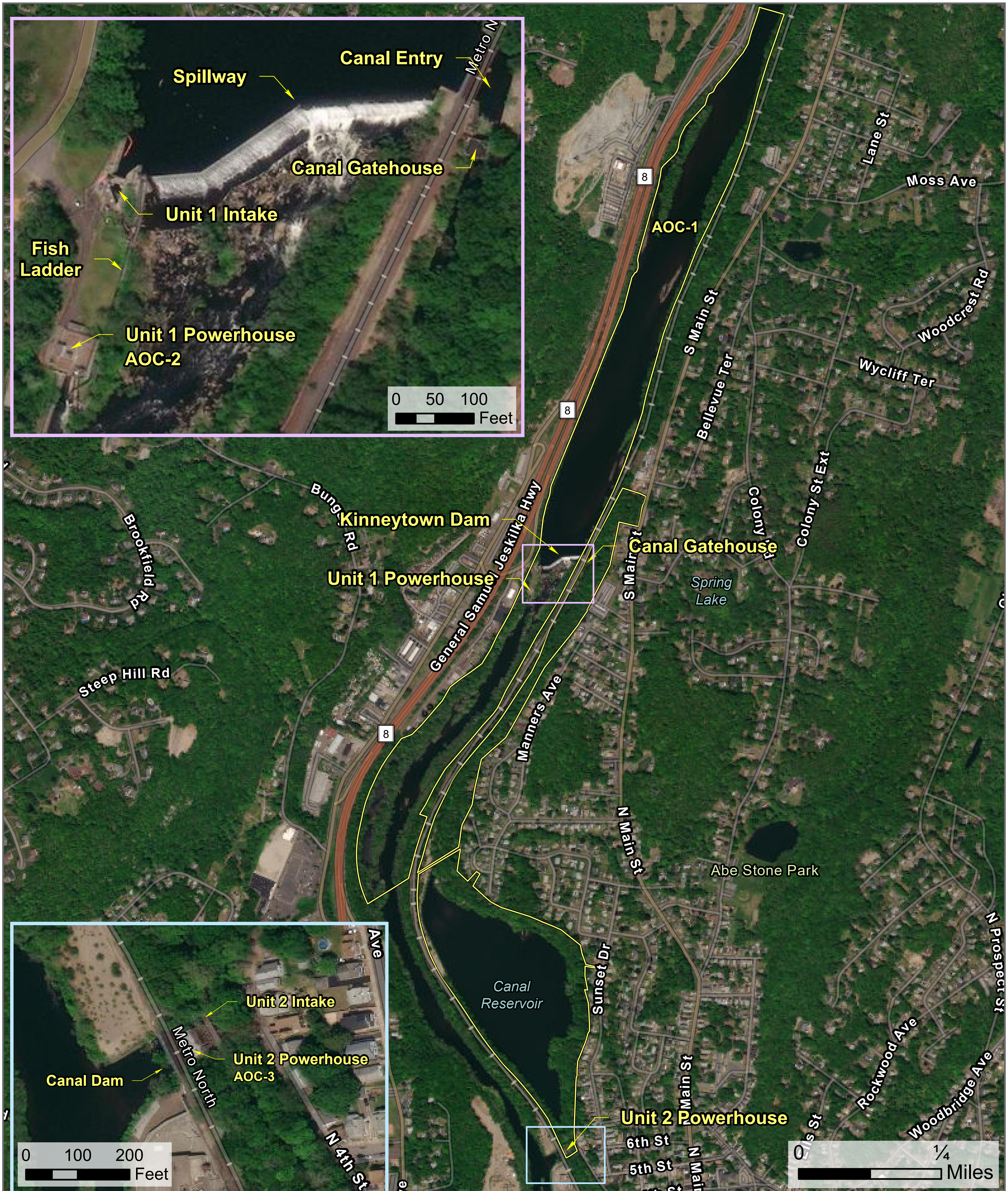
**Figure 1:** Site Location
Kinneytown Dam
Seymour, CT




U.S. Department of Transportation
Volpe Center

Site Coordinates: 41.368713, -73.085235
May 2023
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed April, 2023.

**Figure 2:** Topographic Map
Kinneytown Dam
Seymour, CT

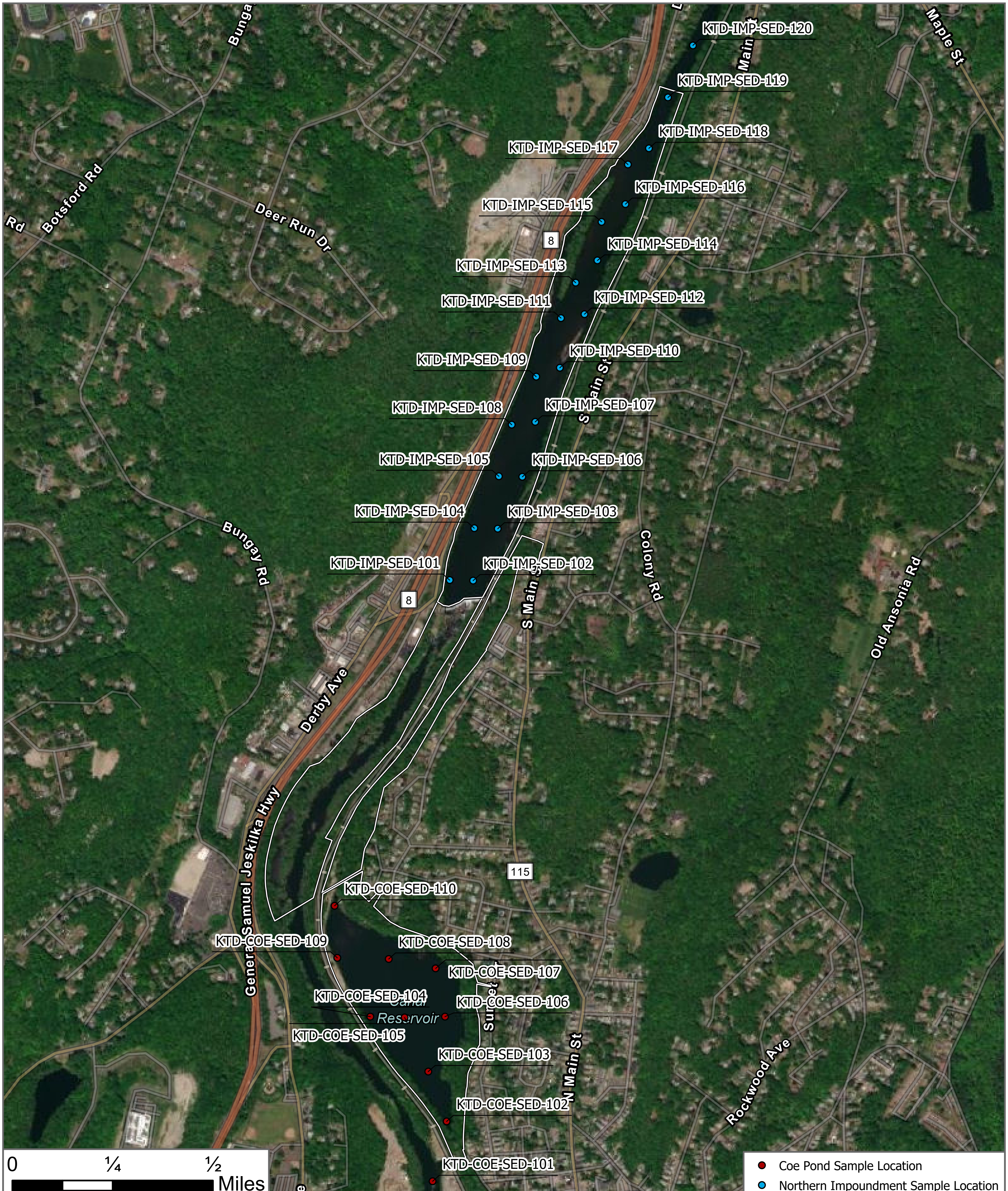



U.S. Department of Transportation
Volpe Center

Site Coordinates: 41.368713, -73.085235
January 2023
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

**Figure 3:** Site Layout
Kinneytown Dam
Seymour, CT




U.S. Department of Transportation
Volpe Center

Site Coordinates: 41.368713, -73.085235
May 2023
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

**Figure 4:** Sediment Sampling Locations
Kinneytown Dam
Seymour, CT

# Appendix A
# Analyte Lists

## Metals

CT 15 Metals – Total or Dissolved by ICP-AES/ICP-MS/CVAA

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| antimony | 7440-36-0 | 2 | 27 | - | - | 2 | 25 |
| arsenic | 7440-38-2 | 0.4 | 10 | 33 | 9.8 | 9.8 | 33 |
| barium | 7440-39-3 | 0.4 | 4,700 | - | - | - | - |
| beryllium | 7440-41-7 | 0.2 | 2 | - | - | - | - |
| cadmium | 7440-43-9 | 0.4 | 34 | 4.98 | 0.99 | 1 | 5 |
| chromium (total)[1] | 7440-47-3 | 0.4 | - | 111 | 43.4 | 43.4 | 111 |
| chromium (III) | 16065-83-3 | NA | 3,900 | - | - | - | - |
| chromium (VI) | 18540-29-9 | 0.8 | 100 | - | - | - | - |
| copper | 7440-50-08 | 0.4 | 2,500 | 149 | 31.6 | 31.6 | 149 |
| lead | 7439-92-1 | 2 | 400 | 128 | 35.8 | 35.8 | 128 |
| mercury | 7439-97-6 | 0.08 | 20 | 1.06 | 0.18 | 0.18 | 1.1 |
| nickel | 7440-02-0 | 1 | 1,400 | 48.6 | 22.7 | 22.7 | 48.6 |
| selenium | 7782-49-2 | 0.8 | 340 | - | 2 | 0.72 | 2.9 |
| silver | 7440-22-4 | 0.4 | 340 | - | 1 | 1 | 2.2 |
| thallium | 7440-28-0 | 0.8 | 5.4 | - | - | - | - |
| vanadium | 7440-62-2 | 0.4 | 470 | - | - | - | - |
| zinc | 7440-66-6 | 2 | 20,000 | 459 | 121 | 121 | 459 |

1. If the chromium (total) standard is exceeded, the sample will be analyzed for chromium (VI) and compared to the applicable standards for chromium (III) and chromium (VI).

Analyte: analyte's common name
CAS No.: analyte's Chemical Abstracts Service number
Lab RDL: Laboratory Reportable Detection Limit provided by the lab
CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A
NOAA FPEC: Freshwater Probable Effect Concentration
NOAA FTEC: Freshwater Threshold Effect Concentration
EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values
ESV: Ecological Screening Value
RSV: Refinement Screening Value

## VOCs

CT RCP Low Level Method 5035A/8260D by GC/MS Analyte List

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| acetone | 67-64-1 | 5 | 500 | - | - | 0.065 | 38.133 |
| acrylonitrile | 107-13-1 | .004 | 1.1 | - | - | 0.030 | 0.151 |
| benzene | 71-43-2 | 0.0005 | 21 | - | - | 0.010 | 2.185 |
| bromobenzene | 108-86-1 | 0.002 | - | - | - | - | - |
| bromodichloromethane | 75-27-4 | 0.005 | - | - | - | 0.210 | - |
| bromoform | 75-25-2 | 0.002 | 78 | - | - | 0.142 | - |
| bromomethane | 74-83-9 | 0.002 | - | - | - | 0.0065 | - |
| sec-butylbenzene | 135-98-8 | 0.0005 | - | - | - | - | - |
| n-butylbenzene | 104-51-8 | 0.0005 | - | - | - | - | - |
| tert-butylbenzene | 98-06-6 | 0.0025 | - | - | - | - | - |
| carbon disulfide | 75-15-0 | 0.005 | - | - | - | 0.0078 | 1.580 |
| carbon tetrachloride | 56-23-5 | 0.0005 | 4.7 | - | - | 0.057 | 0.706 |
| chlorobenzene | 108-90-7 | 0.0005 | 500 | - | - | 0.0030 | 0.939 |
| chlorodibromomethane | 124-48-1 | 0.0005 | - | - | - | 0.198 | - |
| chloroethane | 75-00-3 | .001 | - | - | - | - | - |
| chloroform | 67-66-3 | 0.005 | 100 | - | - | 0.087 | 3.352 |
| chloromethane | 74-87-3 | 0.0025 | - | - | - | - | - |
| 2-chlorotoluene | 95-49-8 | 0.002 | - | - | - | - | - |
| 4-chlorotoluene | 106-43-4 | 0.002 | - | - | - | - | - |
| 1,2-dibromo-3-chloropropane | 96-12-8 | 0.003 | - | - | - | - | - |
| 1,2-dibromoethane (EDB) | 106-93-4 | 0.001 | - | - | - | - | - |
| dibromomethane | 74-95-3 | 0.002 | - | - | - | - | - |
| 1,2-dichlorobenzene (o-DCB) | 95-50-1 | 0.002 | 500 | - | - | 0.095 | 0.477 |
| 1,3-dichlorobenzene (m-DCB) | 541-73-1 | 0.002 | 500 | - | - | 0.089 | 0.468 |
| 1,4-dichlorobenzene (p-DCB) | 106-46-7 | 0.002 | 26 | - | - | 0.030 | 0.468 |

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| Trans-1,4-dichloro-2-butene | 11-05-76 | - | - | - | - | - | - |
| dichlorodifluoromethane (freon 12) | 75-71-8 | 0.010 | 7.3 | - | - | - | - |
| 1,1-dichloroethane | 75-34-3 | 0.001 | 500 | - | - | 0.020 | 1.666 |
| 1,2-dichloroethane | 107-06-02 | 0.001 | 6.7 | - | - | 0.986 | 1.131 |
| 1,1-dichloroethylene | 75-35-4 | 0.001 | 1 | - | - | 0.100 | 0.753 |
| cis-1,2-dichloroethylene | 156-59-2 | 0.001 | 500 | - | - | 0.432 | 1.135 |
| trans-1,2-dichloroethylene | 156-60-5 | 0.0015 | 500 | - | - | 0.389 | 1.135 |
| 1,2-dichloropropane | 78-87-5 | 0.001 | 9 | - | - | 0.428 | 0.876 |
| 1,3-dichloropropane | 142-28-9 | 0.002 | 3.4 | - | - | - | - |
| 2,2-dichloropropane | 594-20-7 | 0.002 | - | - | - | - | - |
| 1,1-dichloropropene | 563-58-6 | 0.0005 | - | - | - | - | - |
| cis-1,3-dichloropropene | 10061-01-5 | 0.0005 | - | - | - | - | - |
| trans-1,3-dichloropropene | 10061-02-6 | 0.001 | - | - | - | - | - |
| ethylbenzene | 100-41-4 | 0.001 | 500 | - | - | 0.290 | 1.467 |
| hexachlorobutadiene | 87-68-3 | 0.004 | 50 | - | - | - | - |
| 2-hexanone (MNBK) | 591-78-6 | 0.010 | - | - | - | 0.045 | 7.598 |
| isopropylbenzene (cumene) | 98-82-8 | 0.001 | - | - | - | 0.035 | 0.713 |
| p-isopropyltoluene | 99-87-6 | 0.001 | - | - | - | 0.184 | 0.242 |
| methyl ethyl ketone (MEK) | 78-93-3 | 0.01 | 500 | - | - | 7.604 | 22.707 |
| methyl isobutyl ketone (MIBK) | 108-10-1 | 0.01 | - | - | - | 0.073 | 8.165 |
| methyl tertiary butyl ether (MTBE) | 1634-04-4 | 0.002 | 500 | - | - | 0.304 | 4.433 |
| methylene chloride | 75-09-2 | 0.005 | 82 | - | - | 0.018 | 2.404 |
| naphthalene | 91-20-3 | 0.004 | 1000 | 0.561 | 0.176 | 0.176 | - |
| n-propylbenzene | 103-65-1 | 0.001 | - | - | - | - | - |
| styrene | 100-42-5 | 0.001 | 500 | - | - | 0.126 | 1.621 |
| 1,1,1,2-tetrachloroethane | 630-20-6 | 0.0005 | 24 | - | - | 0.099 | 0.418 |
| 1,1,2,2-tetrachloroethane | 79-34-5 | 0.0005 | 3.1 | - | - | 0.250 | 2.230 |
| tetrachloroethylene (PCE) | 127-18-4 | 0.0005 | 12 | - | - | 0.002 | 0.415 |
| tetrahydrofuran (THF) | 109-99-9 | 0.004 | - | - | - | 4.488 | 8.0 |

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| toluene | 108-88-3 | 0.001 | 500 | - | - | 0.010 | 2.074 |
| 1,2,3-trichlorobenzene | 87-61-6 | 0.002 | - | - | - | 0.113 | 0.495 |
| 1,2,4-trichlorobenzene | 120-82-1 | 0.002 | - | - | - | 0.011 | 0.485 |
| 1,1,1-trichloroethane | 71-55-6 | 0.0005 | 500 | - | - | 0.070 | 0.367 |
| 1,1,2-trichloroethane | 79-00-5 | 0.001 | 11 | - | - | 0.538 | 1.545 |
| trichloroethylene (TCE) | 79-01-6 | 0.0005 | 56 | - | - | 0.078 | 0.692 |
| trichlorofluoromethane (Freon 11) | 75-69-4 | 0.004 | - | - | - | - | - |
| 1,2,3-trichloropropane | 96-18-4 | 0.010 | - | - | - | - | - |
| trichlorotrifluoroethane (Freon-113) | 76-13-1 | 0.004 | - | - | - | - | - |
| 1,2,4-trimethylbenzene | 95-63-6 | 0.010 | - | - | - | 0.097 | 0.361 |
| 1,3,5-trimethylbenzene | 108-67-8 | 0.002 | - | - | - | 0.164 | 0.354 |
| vinyl chloride | 75-01-4 | 0.001 | 0.32 | - | - | - | - |
| o-xylene | 95-47-6 | 0.001 | 500 | - | - | - | - |
| m-xylene | 108-38-3 | 0.002 | 500 | - | - | - | - |
| p-xylene | 106-42-3 | 0.002 | 500 | - | - | - | - |

If a high level analysis is required for methanol preserved soil VOC samples, the laboratory will apply a 50x multiplier to the Soil RDLs listed in this table.

Analyte: analyte's common name
CAS No.: analyte's Chemical Abstracts Service number
Lab RDL: Laboratory Reportable Detection Limit provided by the lab
CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A
NOAA FPEC: Freshwater Probable Effect Concentration
NOAA FTEC: Freshwater Threshold Effect Concentration
EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values
ESV: Ecological Screening Value
RSV: Refinement Screening Value

# SVOCs

CT RCP Method 8270 by GC/MS Analyte List

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | FPEC | FTEC | ESV | RSV |
| acenaphthene | 83-32-9 | 0.1336 | - | - | - | 0.0067 | - |
| acenaphthylene | 208-96-8 | 0.1336 | 1000 | - | - | 0.0059 | - |
| aniline | 62-53-3 | 0.2004 | - | - | - | 0.0023 | 0.012 |
| anthracene | 120-12-7 | 0.1002 | 1000 | 0.845 | 0.0572 | 0.057 | - |
| benzo(a)anthracene | 56-55-3 | 0.1002 | 1 | - | - | 0.108 | - |
| benzo(a)pyrene | 50-32-8 | 0.1336 | 1 | 1.45 | 0.15 | 0.150 | - |
| benzo(b)fluoranthene | 205-99-2 | 0.1002 | 1 | - | - | 0.190 | - |
| benzo(k)fluoranthene | 207-08-9 | 0.1002 | 8.4 | - | - | 0.240 | - |
| benzo(g,h,i)perylene | 191-24-2 | 0.1336 | - | - | - | 0.170 | - |
| 4-bromophenyl phenyl ether | 101-55-3 | 0.167 | - | - | - | 0.047 | 0.062 |
| butyl benzyl phthalate | 85-68-7 | 0.167 | - | - | - | 0.100 | 0.481 |
| di-n-butyl phthalate | 84-74-2 | 0.167 | 1000 | - | - | 0.011 | 0.319 |
| Carbazole | 86-74-8 | 0.167 | - | - | - | 0.069 | 4.561 |
| 4-chloroaniline | 106-47-8 | 0.167 | - | - | - | 0.0009 | 0.021 |
| bis (2-chloroethoxy)methane | 111-91-1 | 0.18036 | - | - | - | - | - |
| bis (2-chloroethyl)ether | 111-44-4 | 0.1503 | 1 | - | - | - | 8.163 |
| bis (2-chloroisopropyl)ether | 108-60-1 | 0.2004 | 8.8 | - | - | - | - |
| 2-chloronaphthalene | 91-58-7 | 0.167 | - | - | - | - | - |
| 2-chlorophenol | 95-57-8 | 0.167 | 340 | - | - | 0.055 | 0.55 |
| chrysene | 218-01-9 | 0.1002 | - | 1.29 | 0.166 | 0.166 | - |
| dibenzo(a,h)anthracene | 53-70-3 | 0.1002 | - | - | - | 0.033 | - |
| dibenzofuran | 132-64-9 | 0.167 | | | | 0.510 | 2.313 |
| 1,2-dichlorobenzene | 95-50-1 | 0.167 | | | | - | - |
| 1,3-dichlorobenzene | 541-73-1 | 0.167 | | | | - | - |
| di-n-octyl phthalate | 117-84-0 | 0.167 | 1000 | | | 0.039 | 1.100 |
| 3-3'-dichlorobenzidine | 91-94-1 | 0.167 | | | | 0.031 | 0.090 |
| 1,4-dichlorobenzene | 106-46-7 | 0.167 | | | | - | - |

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | FPEC | FTEC | ESV | RSV |
| 2,4-dichlorophenol | 120-83-2 | 0.1503 | - | - | - | 0.057 | 1.886 |
| diethyl phthalate | 84-66-2 | 0.167 | - | - | - | 0.630 | 1.105 |
| dimethyl phthalate | 131-11-3 | 0.167 | - | - | - | 0.678 | 2.031 |
| 2,4-dimethylphenol | 105-67-9 | 0.167 | - | - | - | 0.039 | 1.437 |
| 2,4-dinitrophenol | 51-28-5 | 0.8016 | - | - | - | 0.223 | 2.961 |
| 2,4-dinitrotoluene | 121-14-2 | 0.167 | - | - | - | 0.290 | 2.900 |
| 2,6-dinitrotoluene | 606-20-2 | 0.167 | - | - | - | 0.296 | 0.131 |
| bis (2-ethylhexyl) phthalate | 117-81-7 | 0.167 | 44 | - | - | 0.180 | 2.600 |
| fluoranthene | 206-44-0 | 0.1002 | 1000 | 2.23 | 0.423 | 0.423 | - |
| fluorene | 86-73-7 | 0.167 | 1000 | 0.536 | 0.0774 | 0.077 | - |
| hexachlorobenzene | 118-74-1 | 0.1002 | 1 | - | - | 0.020 | 0.240 |
| hexachlorobutadiene | 87-68-3 | 0.167 | - | - | - | - | - |
| hexachloroethane | 67-72-1 | 0.1336 | 44 | - | - | 0.027 | 0.075 |
| indeno (1,2,3-cd) pyrene | 193-39-5 | 0.1336 | - | - | - | 0.200 | - |
| isophorone | 78-59-1 | 0.1503 | - | - | - | 0.876 | 0.948 |
| 2-methylnapthalene | 91-57-6 | 0.167 | | | | 0.0202 | - |
| 2-methylphenol | 95-48-7 | 0.167 | - | - | - | 0.119 | 1.773 |
| 4-methylphenol | 106-44-5 | 0.024048 | - | - | - | 0.093 | 0.260 |
| naphthalene | 91-20-3 | 0.167 | 1000 | 0.561 | 0.176 | 0.176 | - |
| 2-nitroaniline | 88-74-4 | 0.167 | - | - | - | - | - |
| 3-nitroaniline | 99-09-2 | 0.167 | - | - | - | - | - |
| 4-nitroaniline | 100-01-6 | 0.167 | - | - | - | - | - |
| nitrobenzene | 98-95-3 | 0.1503 | - | - | - | 0.407 | 9.007 |
| 2-nitrophenol | 88-75-5 | 0.36072 | - | - | - | 0.168 | 3.589 |
| 4-nitrophenol | 100-02-7 | 0.2338 | - | - | - | 0.153 | 4.105 |
| n-nitrosodiphenylamine | 86-30-6 | 0.334 | - | - | - | 0.110 | 0.370 |
| n-nitroso-di-n-propylamine | 621-64-7 | 0.167 | - | - | - | - | - |
| Pentachloronitrobenzene | 82-68-8 | - | - | - | - | - | - |
| pentachlorophenol | 87-86-5 | 0.1336 | 5.1 | - | - | 0.010 | 1.200 |

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 | |
| | | | | FPEC | FTEC | ESV | RSV |
| phenanthrene | 85-01-8 | 0.1002 | 1000 | 1.17 | 0.204 | 0.204 | - |
| phenol | 108-95-2 | 0.167 | 1000 | - | - | - | - |
| pyrene | 129-00-0 | 0.1002 | 1000 | 1.52 | 0.195 | 0.195 | - |
| 1,2,4-trichlorobenzne | 120-82-1 | 0.167 | - | - | - | - | - |
| 2,4,5-trichlorophenol | 95-95-4 | 0.167 | - | - | - | 0.034 | 1.964 |
| 2,4,6-trichlorophenol | 88-06-2 | 0.1002 | - | - | - | 0.089 | 1.964 |

Analyte: analyte's common name
CAS No.: analyte's Chemical Abstracts Service number
Lab RDL: Laboratory Reportable Detection Limit provided by the lab
CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A
NOAA FPEC: Freshwater Probable Effect Concentration
NOAA FTEC: Freshwater Threshold Effect Concentration
EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values
ESV: Ecological Screening Value
RSV: Refinement Screening Value

# ETPH

Analysis of Extractable Total Petroleum Hydrocarbons by GC (CT-ETPH Method)

| Analyte | CAS No. | Sediment (mg/kg) | | | | |
|---|---|---|---|---|---|---|
| | | Lab RDL | CT-RCS | NOAA | | EPA Region 4 |
| | | | | *FPEC* | *FTEC* | |
| **ETPH** | | | | | | |
| $C_9$-$C_{36}$ aliphatic hydrocarbons | NA | 13 | 500 | - | - | NA |

Lab RDL: Laboratory Reportable Detection Limit provided by the lab

CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A

NOAA FPEC: Freshwater Probable Effect Concentration

NOAA FTEC: Freshwater Threshold Effect Concentration

EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values

## PCBs

EPA Method 8082 by Capillary Column GC

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| Aroclor 1016 | 12674-11-2 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1221 | 11104-28-2 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1232 | 11141-16-5 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1242 | 53469-21-9 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1248 | 12672-29-6 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1254 | 11097-69-1 | 0.05 | 1 | 0.676 | - | - | - |
| Aroclor 1260 | 11096-82-5 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1262 | 37324-23-5 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Aroclor 1268 | 11100-14-4 | 0.05 | 1 | 0.676 | 0.0598 | - | - |
| Total PCBs | 1336-36-3 | 0.05 | 1 | 0.676 | 0.0598 | 0.0598 | 0.676 |

Analyte: analyte's common name

CAS No.: analyte's Chemical Abstracts Service number

Lab RDL: Laboratory Reportable Detection Limit provided by the lab

CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A

NOAA FPEC: Freshwater Probable Effect Concentration

NOAA FTEC: Freshwater Threshold Effect Concentration

EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values

ESV: Ecological Screening Value

RSV: Refinement Screening Value

## Pesticides

Organochlorine Pesticides by GC EPA 8081

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| aldrin | 309-00-2 | 0.0016 | - | - | - | 0.029 | 0.080 |
| alpha-BHC | 319-84-6 | 0.000667 | - | - | - | 0.0003 | 0.006 |
| beta-BHC | 319-85-7 | 0.000667 | - | - | - | 0.005 | 0.0072 |
| gamma-BHC (Lindane) | 58-89-9 | 0.000667 | 20 | - | - | 0.0024 | 0.005 |
| delta-BHC | 319-86-8 | 0.0016 | - | - | - | - | - |
| chlordane | 57-74-9 | 0.01334 | 0.49 | 0.0176 | 0.00324 | 0.0032 | 0.018 |
| 4,4'-DDD | 72-54-8 | 0.0016 | - | 0.028 | 0.00488 | 0.0035 | 0.0085 |
| 4,4'-DDE | 72-55-9 | 0.0016 | - | 0.0313 | 0.00316 | 0.0014 | 0.0068 |
| 4,4'-DDT | 50-29-3 | 0.003 | - | 0.0629 | 0.00416 | 0.001 | 0.007 |
| dieldrin | 60-57-1 | 0.001 | 0.038 | 0.0618 | 0.0019 | 0.0019 | 0.062 |
| endosulfan I | 959-98-8 | 0.0016 | - | - | - | - | - |
| endosulfan II | 33213-65-9 | 0.0016 | - | - | - | 0.0009 | - |
| endosulfan sulfate | 1031-07-8 | 0.000667 | - | - | - | 0.0007 | - |
| endrin | 72-20-8 | 0.000667 | 20 | 0.207 | 0.00222 | 0.0022 | 0.207 |
| endrin ketone | 53494-70-5 | 0.0016 | - | - | - | - | - |
| heptachlor | 76-44-8 | 0.0008004 | 0.14 | - | - | 0.0006 | 0.075 |
| heptachlor epoxide | 1024-57-3 | 0.003 | 0.067 | 0.016 | 0.00247 | 0.0025 | 0.016 |
| hexachlorobenzene | 118-74-1 | 0.008 | - | - | - | 0.020 | 0.240 |
| methoxychlor | 72-43-5 | 0.003 | 340 | - | - | 0.030 | 0.059 |
| Toxaphene | 8001-35-2 | 0.03 | 0.56 | | | 0.0001 | 0.032 |

Analyte: analyte's common name

CAS No.: analyte's Chemical Abstracts Service number

Lab RDL: Laboratory Reportable Detection Limit provided by the lab

CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A

NOAA FPEC: Freshwater Probable Effect Concentration; NOAA FTEC: Freshwater Threshold Effect Concentration

EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values

ESV: Ecological Screening Value; RSV: Refinement Screening Value

## Herbicides

Herbicides EPA 8151A

| Analyte | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | *FPEC* | *FTEC* | ESV | RSV |
| 2,5-dichloro-6-methoxybenzoic acid (Dicamba) | 1918-00-9 | 0.033 | - | - | - | - | |
| 2,4-D | 94-75-7 | 0.1665 | 680 | | | | |
| 2,4-dichlorophenoxy butyric acid (2,4-DB) | 94-82-6 | 0.1665 | - | - | - | - | |
| 2-(2,4-dichlorophenoxy) propionic acid (Dichloroprop) | 120-36-5 | 0.033 | - | - | - | - | |
| 2,2-dichloro propionic acid (Dalapon) | 75-99-0 | 0.033 | - | - | - | - | |
| 2,4-dinitro-6-sec-butylphenol (Dinoseb) | 88-85-7 | - | - | - | - | 0.000611 | |
| 2-methyl-4-chlorophenoxy acetic acid (MCPA) | 94-74-6 | 3.33 | - | - | - | - | |
| 2-(2-methyl-4-chlorophenoxy) propionic acid (MCPP) | 93-65-2 | 3.33 | - | - | - | - | |
| 2,4,5-trichlorophenoxy acetic acid (2,4,5-T) | 93-76-5 | 0.1665 | - | - | - | 12.3 | |
| 2,4,5-trichlorophenoxy propionic acid (2,4,5-TP) | 93-72-1 | 0.1665 | - | - | - | 0.675 | |

Analyte: analyte's common name added in parenthesis
CAS No.: analyte's Chemical Abstracts Service number
Lab RDL: Laboratory Reportable Detection Limit provided by the lab
CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A
NOAA FPEC: Freshwater Probable Effect Concentration
NOAA FTEC: Freshwater Threshold Effect Concentration
EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values
ESV: Ecological Screening Value
RSV: Refinement Screening Value

# PFAS

Method 1633 Analysis of Per- and Polyfluoroalkyl Substances (PFAS) by LC-MS/MS

| Analyte | Acronym | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | | *FPEC* | *FTEC* | ESV | RSV |
| **PERFLUOROALKYL ETHER CARBOXYLIC ACIDS (PFECAs)** | | | | | | | | |
| Tetrafluoro-2-(heptafluoropropoxy)propanoic acid | HFPO-DA | 13252-13-6 | - | - | - | - | - | |
| 4,8-dioxa-3H-perfluorononanoic acid | ADONA | 919005-14-4 | - | - | - | - | - | |
| Perfluoro-3-methoxypropanoic acid | PFMPA | 377-73-1 | | | | | | |
| Perfluoro-4-methoxybutanoic acid | PFMBA | 863090-89-5 | | | | | | |
| Nonafluoro-3,6-dioxaheptanoic acid | NFDHA | 151772-58-6 | | | | | | |
| **PERFLUOROALKYLCARBOXILIC ACIDS (PFCAs)** | | | | | | | | |
| Perfluorobutanoic acid | PFBA | 375-22-4 | 0.0008 | - | - | - | - | |
| Perfluoropentanoic acid | PFPeA | 2706-30-3 | 0.0004 | - | - | - | - | |
| Perfluorohexanoic acid | PFHxA | 307-24-4 | 0.0002 | - | - | - | - | |
| Perfluoroheptanoic acid | PFHpA | 375-85-9 | 0.0002 | 1.35* | - | - | - | |
| Perfluorooctanoic acid | PFOA | 335-67-1 | 0.0002 | 1.35* | - | - | - | |
| Perfluorononanoic acid | PFNA | 375-95-1 | 0.0002 | 1.35* | - | - | - | |
| Perfluorodecanoic acid | PFDA | 335-76-2 | 0.0002 | - | - | - | - | |
| Perfluoroundecanoic acid | PFUnA | 2058-94-8 | 0.0002 | - | - | - | - | |
| Perfluorododecanoic acid | PFDoA | 307-55-1 | 0.0002 | - | - | - | - | |
| Perfluorotridecanoic acid | PFTrDA | 72629-94-8 | 0.0002 | - | - | - | - | |
| Perfluoorotetradecanoic acid | PFTeDA | 376-06-7 | 0.0002 | - | - | - | - | |
| **PERFLUOROALKYL SULFONIC ACIDS (PFASs)** | | | | | | | | |
| Perfluorobutanesulfonic acid | PFBS | 375-73-5 | 0.0002 | - | - | - | - | |
| Perfluoropentanesulfonic acid | PFPeS | 2706-91-4 | 0.0002 | - | - | - | - | |
| Perfluorohexanesulfonic acid | PFHxS | 355-46-4 | 0.0002 | 1.35* | - | - | - | |
| Perfluoroheptanesulfonic acid | PFHpS | | 0.0002 | | | | | |
| Perfluorooctanesulfonic acid | PFOS | 1763-23-1 | 0.0002 | 1.35* | - | - | - | |

| Analyte | Acronym | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | | *FPEC* | *FTEC* | ESV | RSV |
| Perfluorononanesulfonic acid | PFNS | 68259-12-1 | 0.0002 | - | - | - | - | |
| Perfluorodecanesulfonic acid | PFDS | 335-77-3 | 0.0016 | - | - | - | 0.0029 | |
| Perfluorododecanesulfonic acid | PFDoS | 79780-39-5 | 0.0016 | - | - | - | 0.014 | |
| **CHLORO-PERFLOROALKYLSULFONATE** | | | | | | | | |
| 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid 1 | 11Cl-PF3OUdS | 763051-92-9 | 0.0008 | - | - | - | - | |
| 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid 1 | 9Cl-PF3ONS | 756426-58-1 | 0.0008 | - | - | - | - | |
| **PERFLUOROOCTANESULFONAMIDES (FOSAs)** | | | | | | | | |
| Perfluorooctanesulfonamide | PFOSA | 754-91-6 | 0.0002 | - | - | - | - | |
| N-methylperfluoro-1-octanesulfonamide | NMeFOSA | 31506-32-8 | 0.0002 | - | - | - | - | |
| N-ethylperfluoro-1-octanesulfonamide | NEtFOSA | 4151-50-2 | 0.0002 | - | - | - | - | |
| **FLUOROTELOMER CARBOXYLIC ACIDS** | | | | | | | | |
| 3-Perfluoropropyl propanoic acid | 3:3FTCA | 356-02-05 | 0.001 | - | - | - | - | |
| 2H,2H,3H,3H-Perfluorooctanoic acid | 5:3FTCA | 914637-49-3 | 0.005 | - | - | - | - | |
| Perfluoroheptyl propanoic acid | 7:3FTCA | 812-70-4 | 0.005 | - | - | - | - | |
| **PERFLUOROCTANE SULFONAMIDE ETHANOLS** | | | | | | | | |
| N-Methyl perfluorooctanesulfonamidoethanol | NMeFOSE | 24448-09-7 | 0.002 | - | - | - | - | |
| N-ethyl perfluorooctanesulfonamidoethanol | NEtFOSE | 1691-99-2 | 0.002 | - | - | - | - | |
| **TELOMER SULFONIC ACIDS** | | | | | | | | |
| 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2) | 4:2FTS | 757124-72-4 | 0.0008 | - | - | - | - | |
| 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2) | 6:2FTS | 27619-97-2 | 0.0008 | - | - | - | - | |
| 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2) | 8:2FTS | 39108-34-4 | 0.0008 | - | - | - | - | |

| Analyte | Acronym | CAS No. | Sediment (mg/kg) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lab RDL | CT RCS | NOAA | | EPA Region 4 | |
| | | | | | *FPEC* | *FTEC* | ESV | RSV |
| **PERFLUOROOCTANESULFONAMIDOACETIC ACIDS** | | | | | | | | |
| N-methyl perfluorooctanesulfonamidoacetic acid | NMeFOSAA | 2355-31-9 | 0.0002 | - | - | - | - | |
| N-ethyl perfluorooctanesulfonamidoacetic acid | NEtFOSAA | 2991-50-6 | 0.0002 | - | - | - | - | |
| **PERLUOROETHER AND POLYETHER CABOXYLIC ACIDS** | | | | | | | | |
| Perfluoro-3-methoxypropanoic acid | PFMPA | 377-73-1 | 0.0004 | | | | | |
| Perfluoro-4-methoxybutanoic acid | PFMBA | 863090-89-5 | 0.0004 | | | | | |
| Perfluoro(2-ethoxyethane)sulfonic acid | PFEESA | 113507-82-7 | 0.0004 | | | | | |
| Nonafluoro-3,6-dioxaheptanoic acid | NFDHA | 151772-58-6 | 0.0004 | | | | | |

Analyte: analyte's common name
CAS No.: analyte's Chemical Abstracts Service number
Lab RDL: Laboratory Reportable Detection Limit provided by the lab
CT-RCS: Connecticut Residential Direct Exposure Criteria in Soil provided in CT Regs 22a-133k-3 Appendix A
NOAA FPEC: Freshwater Probable Effect Concentration
NOAA FTEC: Freshwater Threshold Effect Concentration
EPA Region 4 Sediment Screening Value for Hazardous Waste Sites - Freshwater Sediment Screening Values
ESV: Ecological Screening Value
RSV: Refinement Screening Value

Recommended CT RSR Polluting Substance Criteria applies the sum of PFOA, PFOS, PFNA, PFHxS, PFHpA