

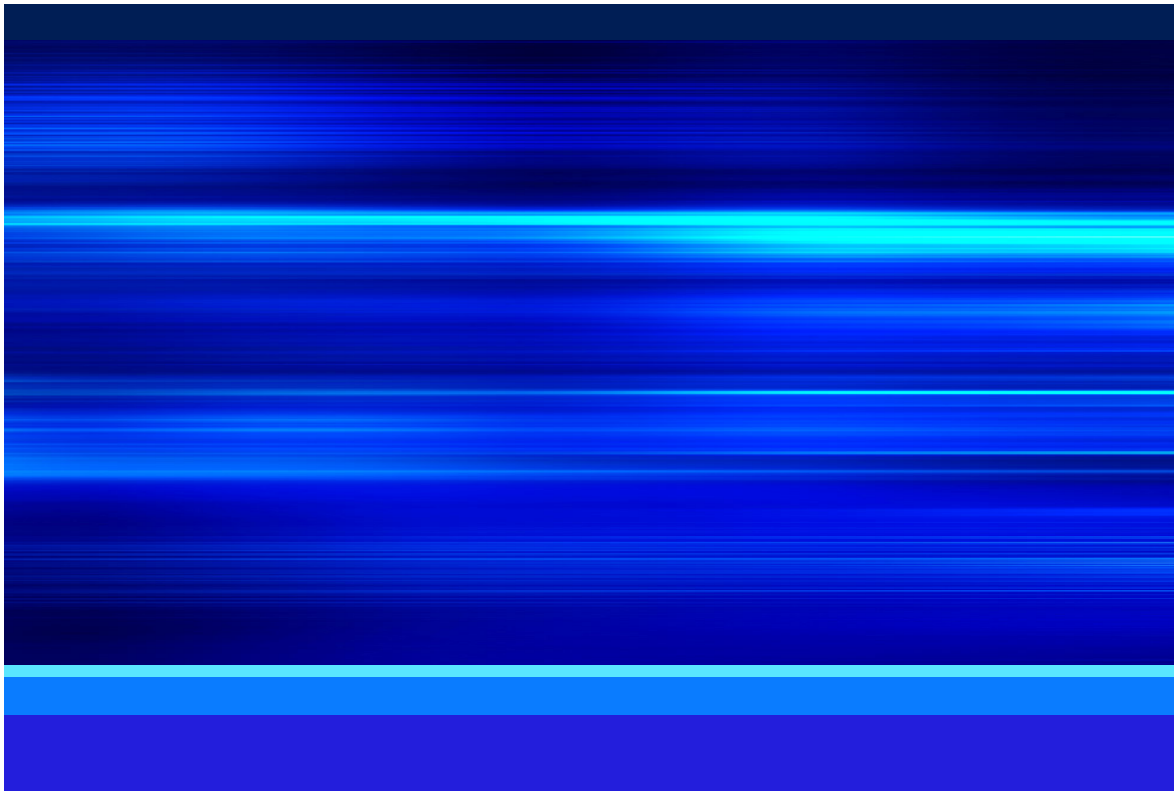
Remedial Design Report In Situ Thermal Treatment

Version: Final

Operable Unit 01, Essex-Hope Site, Jamestown, NY
The Dow Chemical Company

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Remedial Design Report In Situ Thermal Treatment

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Certification

I Joseph J. Corrado certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Design was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.



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Acronyms and Abbreviations

~	approximately
°C	degree(s) Celsius
amsl	above mean sea level
AROD	Amendment to the Record of Decision
bgs	below ground surface
BP	Board of Public Utilities
CAMP	Community Air Monitoring Plan
COC	constituent of concern
CQA	Construction Quality Assurance
CQMP	Construction Quality Management Plan
CVOC	chlorinated volatile organic compound
DCE	dichloroethene
DER	Division of Environmental Remediation
DNAPL	dense nonaqueous phase liquid
Dow	The Dow Chemical Company
EPA	U.S. Environmental Protection Agency
ERH	electrical resistance heating
Essex	Essex Specialty Products LLC
FFS	Focused Feasibility Study
gpm	gallon(s) per minute
HSP	Health and Safety Plan
ID	identifier
ISTT	in situ thermal treatment
kVA	kilovolt-amperes
kW	kilowatt(s)
LGAC	liquid phase granular activated carbon
Mc2	McMillan-McGee Corporation

mg/kg	milligram(s) per kilogram
MNA	monitored natural attenuation
MWh	megawatt-hour(s)
NAPL	nonaqueous phase liquid
NPLS	North Parking Lot Sump
NYCRR	New York State Consolidated Rules and Regulations
OU	Operable Unit
PCE	tetrachloroethene
PID	photoionization detector
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
scfm	standard cubic foot (feet) per minute
SCO	soil cleanup objective
SEE	steam enhanced extraction
Site	Essex-Hope site located at 126 Hopkins Avenue in Jamestown, New York
SMP	Site Management Plan
TCE	trichloroethene
TCH	thermal conductive heating
TMP	thermal monitoring point
TTZ	target treatment zone
UST	underground storage tank
VC	vinyl chloride
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound
WBZ	water-bearing zone
WFL	well field layout
WWTU	wastewater treatment unit

1 Introduction

Jacobs has prepared this *Remedial Design Report* on behalf of Essex Specialty Products LLC (Essex), a former subsidiary of The Dow Chemical Company (Dow). Jacobs and thermal treatment subcontractor McMillan-McGee Corporation (Mc2) are providing remedial design, construction, and operation services for Operable Unit (OU) 01 at the Essex-Hope site located at 126 Hopkins Avenue in Jamestown, New York (site). The overall objective for this remedial action within OU-01 at the site is to reduce the concentration of site-related constituents of concern (COCs), primarily trichloroethene (TCE), 1,2-dichloroethene (DCE), and vinyl chloride (VC) in soil and groundwater within the designated target treatment zone (TTZ).

The Site is listed under the New York Superfund Program (Site Number 907015) and managed by the New York State Department of Environmental Conservation (NYSDEC). The Site is currently owned by an electrical equipment manufacturing and distribution company (United Industries, Inc). The Plant 5 Building, which is located in OU-01 and is the focus of this remedial design, is under lease to Dow and will remain unoccupied for the duration of construction and operation of the remedial system discussed herein. The subject Site overview and features are illustrated in Figures 1 and 2.

A Record of Decision (ROD) for the Site was issued in 1994 and the selected remedial actions were implemented. Numerous supplemental investigations have been performed at the site, most recently in 2022. The results from these investigations indicated that the current remedy is unlikely to address contamination at the site in a timely fashion. As a result, NYSDEC determined that a revised Order on Consent would be needed and that the site should be reorganized into separate OUs. The revised Order on Consent is expected to be signed by Dow and NYSDEC in August 2023. The Operable Units at the site are now:

- OU-00 – Site Management
- OU-01 – Onsite Remedial Program
- OU-01A – Interim Remedial Measure Soil Removal
- OU-02 – Residential Vapor Mitigation System
- OU-03 – Offsite Remedial Program

A *Focused Feasibility Study* (FFS) for OU-01 was developed by Dow to evaluate remedial alternatives (Jacobs 2023c). It was submitted to NYSDEC for their review in November 2022 and updated to respond to comments from NYSDEC in both April and July 2023. In situ thermal treatment (ISTT) was a component of the recommended remedial alternative described in the FFS. This *Remedial Design Report* is being submitted to NYSDEC to satisfy one of the anticipated requirements of the revised Order on Consent. The work described herein will not be implemented until the Order on Consent and ROD (or amendment) for OU-01 are issued by NYSDEC. As the report is being submitted prior to finalizing the FFS and ROD, it assumes that recommendations in the draft FFS will be accepted as final by NYSDEC. If changes are made to either the FFS or ROD that affect the design, this report will be updated and reissued.

2 Site Background

This section outlines site history, and provides an overview of the geology and hydrogeology and nature and extent of the contamination.

2.1 Site History

The site is located in a highly industrialized area with numerous metal working shops and other manufacturing facilities occupying nearby properties, as shown on Figure 1. The property to the north of the site, beyond Hopkins Avenue, is an undeveloped field previously occupied by Hope Windows Plant 6, which was demolished several decades ago. To the east and northeast toward the Chadakoin River are several commercial properties or metalworking shops (ServePro [formerly H&H Metal Specialty Inc.], Johnson Machine, and Rollform), as well as several residences along Bigelow Avenue and Hopkins Avenue. Several manufacturing and commercial businesses are present to the south and southeast of the site, including Jamestown Metal Products. To the west and southwest of the site are United Alloys and Blackstone Advanced Technologies (sheet metal fabrication), respectively. Hope Windows Plants 1 and 3 are located to the west and northwest of the site, respectively (Jacobs 2023b).

The following is a summary of the history of OU-01:

- The southern portion of the site (along Blackstone Avenue) was occupied by Jamestown Finishes, which produced coatings and finishes. The manufacturing processes resulted in environmental impacts from petroleum constituents and, to a lesser extent, chlorinated volatile organic compounds (CVOCs) (NYSDEC 1994). This portion of the Site is outside of the purview of the Remedial Design discussed herein and is only included to provide context.
- The northern portion of the site (along Hopkins Avenue), which includes the Plant 5 Building, was occupied by Hope's Windows and was used to manufacture steel and aluminum windows from approximately 1951 to 1985, when Essex purchased the site (NYSDEC 1994).
- Essex used the Plant 5 Building as a raw materials warehouse until Custom Production Manufacturing (CPM) purchased the site in 2000 for use as a metals fabrication facility (NYSDEC 1994). Until 2021, CPM used numerous chemicals, including TCE, in its Plant 5 Building operation (Jacobs 2022).
- The property was purchased by United Industries, an electrical equipment manufacturing and distribution company, in 2021, and as of 2023, is infrequently occupied and primarily used for storage (Jacobs 2023a). The Plant 5 building is leased to Dow and will not be occupied by the owners during ISTT construction and operation activities (Figure 2).
- There are records of various accidental spills of TCE in the North Parking Lot Sump (NPLS) area. Historical information indicates that a TCE degreaser and a paint/primer tank were removed from the southwestern corner of the Plant 5 Building in 1985 (NYSDEC 1994). Additionally, a sump located in the highest reported CVOC concentrations in the NPLS area was removed during initial remedial actions as documented in Radian Engineering Inc's 1998 Construction Completion Report (Radian 1998). The historical use of this sump is not completely known.

2.2 Geology and Hydrogeology Overview

This section outlines the geology and hydrogeology of the site.

2.2.1 Geology

At the site, the subsurface geological and hydrogeological features have been characterized into four units, described in descending order from ground surface (O'Brien & Gere 1992).

- The first layer is a shallow sand and gravel layer that generally ranges from 10 to 15 feet thick. Grain-size analysis indicates the unit contains on average 46% gravel, 39% sand, and 16% fines (predominantly silt) and were mostly classified as silty sands with gravel to gravel with silt and sand. The unit is interpreted as alluvial outwash deposits (Jacobs 2020).
- A shallow silty clay layer is generally encountered around 15 feet below ground surface (bgs). The shallow silty clay deposits are generally 5 to 10 feet thick, but the thickness and depth can vary considerably and are absent or less than 2 feet thick in some areas. Notably, the clay layer is thin or absent in the western portion of the NPLS, including in the former sump, which was excavated in the 1990s. More permeable lenses of silt and fine sand are present in the silty clay in some locations. Grain-size analysis indicates that the clay unit is 99% fines, evenly divided between silt (53%) and clay (47%). Where present, the shallow silty clay serves as a leaky aquitard separating the shallow and deep aquifers (Jacobs 2020).
- A deep sandy silt is generally encountered around 20 feet bgs and ranges from 13 to 36 feet thick and is shallowest (12 to 25 feet bgs) and thickest (up to 36 feet thick) in the NPLS area. It thins and deepens to the northeast. Based on grain-size analysis, this unit averages 78% silt, 12% sand, and 10% clay. This unit is generally more clay-rich at shallow depths and siltier at depth (Jacobs 2020).
- A deep silty clay has been determined to represent the lower confining layer. The deep silty clay typically is encountered between 37 and 47 feet bgs, and averages 92% fine-grained materials (roughly evenly divided between silt and clay), 6% sand, and 2% gravel (Jacobs 2020). One deep well at the site encountered the deep silty clay to a depth of 95 feet bgs, with very fine to coarse sand encountered from 95 to 100 feet bgs (O'Brien & Gere 1992).

The shallow silty clay, deep sandy silt, and deep silty clay units are interpreted as lacustrine deposits that formed during a period when the site was covered by a glacial lake (Anderson et al. 1982).

2.2.2 Hydrogeology

An aquifer is present within the valley fill deposits of the Chadakoin valley and the Cassadaga Creek and Conewango Creek valleys to the east, with the greatest thicknesses (more than 100 feet) and yields (more than 1,000 gallons per minute [gpm]) east of the site, where the lacustrine silt and clays confine the aquifer. The City of Jamestown obtains its water from two well fields in this aquifer with artesian conditions located northeast of the city and more than 2 miles east of the site. The aquifer at the site was mapped by the U.S. Geological Survey in 1982 (Anderson et al.) as less than 25 feet thick and with potential well yields less than 50 gpm. A regional potentiometric map from the 1980s indicates groundwater flow to the north-northeast at the site toward the Chadakoin River (Jacobs 2023b).

Two primary water-bearing zones (WBZs) have been identified at the Site and are referred to as the shallow WBZ and the deep WBZ. An unconfined aquifer is present in the shallow sand and gravel unit, herein referred to as the shallow WBZ, with saturated thicknesses generally 5 to 10 feet thick. Under non-pumping conditions, groundwater flow is to the east-northeast toward the Chadakoin River (CH2M 2015). Outside the capture zone of the pumping wells, groundwater flow is generally to the east-northeast, although groundwater flow to the north of Hopkins Avenue adjacent to the Site is to the southeast. Groundwater flow patterns may be influenced by utility corridors within Hopkins Avenue. The hydraulic conductivity in the shallow WBZ is 9.1 feet per day with an average groundwater velocity estimated to range from 89 to 177 feet per year (Dow Environmental 1995). Groundwater yield to the

shallow WBZ recovery wells at the Site is meager because of the thin saturated interval (5 to 10 feet) (Jacobs 2023b).

Groundwater is present under confined to semiconfined conditions in the deep sandy silt unit, herein referred to as the deep WBZ. Under non-pumping conditions, groundwater flow in the deep WBZ is to the northeast (CH2M 2015). In locations where the overlying shallow silty clay layer is thin or absent, it is likely there is a hydraulic connection between the shallow and deep WBZs. The average hydraulic conductivity in the deep WBZ is 1.6 feet per day and the average groundwater velocity is approximately 19 feet per year (Dow Environmental 1995). Groundwater yields to the deep WBZ recovery wells are meager because of the low hydraulic conductivity (Jacobs 2023b).

2.3 Nature and Extent of Contamination

Multiple supplemental investigations have been conducted since the 1990s to investigate environmental conditions at the Site. COC impacts present at OU-01 include the following:

- A CVOC groundwater plume in the shallow WBZ that extends from the NPLS area to the northeast roughly parallel to Hopkins Avenue (Figure 3). The primary COC in this plume is TCE, with concentrations ranging from more than 3,000 micrograms per liter (µg/L) on the north side of the Plant 5 Building to generally less than 100 µg/L in the offsite portion of the plume (Jacobs 2023c).
- Two groundwater plumes consisting of petroleum-related compounds in the shallow WBZ in the southern portion of the Site (Figure 3). One plume is primarily located underneath the West Building and consists primarily of xylenes and ethylbenzene. The second, lower concentration plume, is in the eastern former underground storage tank (UST) area and consists primarily of 1,2,4- and 1,3,5-trimethylbenzene. The plumes are relatively stable and do not appear to be migrating significantly (Jacobs 2023c).
- There are residual low-level CVOC and petroleum-related compounds in the shallow WBZ in the former aboveground storage tank/UST area (Figure 3). The groundwater extraction in this area (RW-3S) was suspended in 2017 and residual concentrations are being allowed to naturally attenuate (Jacobs 2023c).
- A CVOC groundwater plume in the deep WBZ extends from the NPLS area to the northeast of the Site (Figure 4). Elevated concentrations of TCE, cis-1,2-DCE, and VC are present, with concentrations greater than 100,000 µg/L in multiple wells. Nonaqueous phase liquid (NAPL), consisting of a waste oil containing TCE and cis-1,2-DCE, is present in a portion of the plume under the Plant 5 Building, as observed in monitoring wells PZ-4D and MW-118D (Jacobs 2022). Based on multiple historical investigations, it appears that NAPL is not present at the bottom of the deep WBZ but does serve as a continuing source for persistently high groundwater concentrations in the upper portion of the deep WBZ (CH2M 2017, 2018; Jacobs 2020, 2023b).
- A 2022 groundwater sample collected from MW-7DD, which is completed in a deeper WBZ about 50 feet below the deep WBZ, had detected concentrations of TCE (350 µg/L) and cis-1,2-DCE (25 µg/L), orders of magnitude lower than the overlying deep WBZ. It is believed that migration is related to the MW-7DD well construction (Jacobs 2023c). This well was sampled again in May 2023 and detected cis 1,2-DCE at 150 µg/L, acetone at 7.7 µg/L, TCE at 31 µg/L, VC at 10 µg/L, 2-butanone at 6 µg/L, and 1,1-DCE at an estimated 0.30 µg/L. This well will be abandoned prior to implementation of any new remedy for OU-01. Following remedy implementation, additional investigation of this deeper WBZ will be conducted to evaluate this potential deeper, lower-level contamination.
- CVOC soil impacts are primarily in the NPLS, under the Plant 5 Building, and extending to the northeast (Figure 5). Soil impacts are primarily in the saturated zone and at depths greater than 15 feet bgs and generally coincide with the CVOC groundwater plume in the deep WBZ (Jacobs 2023a).

- A vapor intrusion (VI) investigation was conducted in 2016 at the former Plant 5 Building and the adjacent West Building to determine if indoor or subsurface sources were contributing to elevated indoor air volatile organic compound (VOC) concentrations another contractor observed in the former Plant 5 Building (URS 2015) and to assess the potential for VOCs linked to groundwater and soil at the Site to migrate into the building. The dataset suggested that although the presence of a complete VI pathway could not be ruled out, the previous indoor air concentrations of TCE were primarily controlled by TCE-containing products used and stored within the building at the time of the investigation (Jacobs 2023b).

3 Treatment Goals and Technology Evaluation,

In 2023, Jacobs completed a draft FFS for OU-01 to evaluate remedial technologies to achieve the remedial action objectives outlined by the ROD. The FFS identified ISTT of the CVOC source area, in situ chemical oxidation (ISCO) of the petroleum source area, followed by natural attenuation with monitoring, and institutional and engineering controls as the preferred alternative. The OU-01 FFS is provided with this document as Appendix A for reference. A new Order on Consent for OU-01 is expected to be signed by NYSDEC and Dow by August 2023.

This section provides an overview of the regulatory framework of OU-01, how the TTZ for ISTT was selected, and the remedial action objectives associated with OU-01.

3.1 Regulatory Framework

The site is listed under the New York Superfund Program (Site Number 907015) and is managed by the NYSDEC. A ROD was issued in 1994 prescribing the implementation of remedial actions at the site (NYSDEC 1994).

The legal decision document guiding remedial efforts at the site remains the ROD and associated executed Order on Consent (NYSDEC 1994). The ROD specifies remedies for the site and identifies remedial action objectives (RAOs) protective of the direct contact and groundwater migration pathways. Previous remediation activities described in Section 2 were undertaken under the 1994 ROD.

Quantitative RAOs were established in the 1994 ROD; however, the depth to which soil RAOs are applicable was not specified in the ROD, and more recent NYSDEC soil cleanup objectives are divided into unrestricted use and restricted use objectives. Restricted use objectives apply only to the first 15 feet of soil below grade, while unrestricted use objectives apply to all soils from the ground surface to bedrock. The environmental covenant in effect at the site restricts use of the site to industrial purposes.

In the FFS, revised RAOs were proposed for OU-01 for the ISTT implementation project discussed herein. This report assumes that NYSDEC will accept the RAOs proposed in the FFS. For background information on these RAOs, or how these RAOs were calculated, please refer to section 3 of the FFS, which is included as Appendix A of this report.

NYSDEC released the proposed Amendment to the Record of Decision (AROD), which details the proposed RAOs for the site, for public comment on August 15, 2023. The AROD document was finalized and signed on September 27, 2023.

3.2 Target Treatment Zone Definition

To reduce the mass of CVOCs in soil and groundwater, a TTZ for the selected remedial action was first identified. Soil data from multiple investigations were used to characterize the lateral and vertical extent of CVOC impacts within OU-01 and offsite to the northeast in OU-03. These data were used to create a three-dimensional model of the distribution of soil concentrations. Soil data were used instead of groundwater data because the majority of CVOC mass is generally found in the sorbed phase rather than dissolved phase. The TTZ incorporates the 25 milligrams per kilogram (mg/kg) TCE plume shell south of Hopkins Ave. TCE concentrations greater than 25 mg/kg extend north of Hopkins Avenue, but they are not included in the TTZ because they are part of OU-03. The 25 mg/kg TCE contour was selected as the most efficient mass that could be targeted without disproportionately increasing the total treatment volume.

The TTZ encompasses approximately 17,013 square feet. Figure 6 and Drawing WFL-01 of the well field layout in Appendix B show the lateral extents of the TTZ.

The vertical extents of the TTZ were defined by both the geologic layers and extent of TCE greater than 25 mg/kg. The shallowest concentrations greater than 25 mg/kg are at the base of the NPLS excavation area, or 14 feet bgs. The top of the TTZ has been set at 10 feet bgs to conservatively capture the shallowest zone of contamination. The shallow extent of the TTZ is at the approximate top of the upper WBZ and does not include the vadose zone where CVOC impacts were typically less than 1 mg/kg. As the TTZ extends to the northeast, the upper silty clay layer dives downward (that is, the top of the unit is deeper), making the 10-foot-bgs top of the TTZ additionally conservative. The bottom of the TTZ is at 40 feet bgs, which is 3 feet deeper than the deepest CVOC concentration greater than 25 mg/kg. The vertical extent of the TTZ spans the three geologic layers and includes both the unconfined upper WBZ and confined lower WBZ shown on Figure 7. The TTZ volume is approximately 24,000 cubic yards.

Areas of OU-01 will exceed the PGW soil cleanup objectives (SCOs) outside of the treatment zone and possibly at locations within the TTZ following ISTT; however, monitored natural attenuation (MNA) will be used to attenuate remaining impacts in soil and groundwater. If MNA is not effective at attaining PGW SCOs after the post-thermal performance monitoring period, other treatment options will be considered. As discussed previously, if groundwater quality standards are attained, the PGW SCOs may no longer be applicable.

3.3 Remedial Action Goals

This section outlines the overall site remediation goals and ISTT remediation goals.

3.3.1 Overall Site Remediation Goals

The FFS included a re-evaluation of the remediation goals presented in the 1994 ROD. The design assumes that those will be accepted by NYSDEC. The revised remediation goals are:

- Eliminate the potential for direct human or animal contact with contaminated soils onsite and direct contact with or ingestion of contaminated groundwater onsite.
- Mitigate the impacts of contaminated groundwater to the environment.
- Mitigate, to the extent practicable, migration of contaminants from onsite source areas to groundwater.
- Provide for attainment of standards, criteria, and guidance (SCGs) (quantitative values) for groundwater and soil quality.
- Mitigate impacts to public health resulting from existing, or the potential for, soil VI into buildings within OU-01 at the Site.
- The FFS also indicated that updates to the SCGs (termed RAOs in the 1994 ROD) are warranted to reflect current New York SCGs since the ROD was signed in 1994 (NYSDEC 1994).

Appendix A presents proposed updated groundwater SCGs for VOCs, which represent promulgated groundwater quality standards in Title 6 of the New York State Consolidated Rules and Regulations (NYCRR) Part 703.5 (NYCRR). Only COCs with recent exceedances of protection of groundwater soil cleanup objectives (SCOs) or promulgated ambient water quality standards for groundwater are proposed to have SCGs.

3.3.2 ISTT Remediation Objectives

The remediation goal of the ISTT system is to reduce the mass of OU-01-related COCs in soil and groundwater within the designed TTZ.

The ISTT system will be operated for a minimum of 180 days, after which system operation may be discontinued at any point at Dow's discretion. The decision to discontinue system operation will be determined based on collective discussion with Dow, Jacobs, and Mc2. Jacobs will provide weekly progress reports to NYSDEC for remediation tracking purposes. When asymptotic removal is observed, supporting data and a formal request for a shutdown will be conveyed to NYSDEC. The determination of whether to discontinue system operation will include an evaluation of performance monitoring data and whether the data indicate:

- Treatment of the source area using ISTT has reached an asymptotic rate of contaminant recovery.
- Additional input of subsurface energy will not measurably increase contaminant removal rate.
- Continued operation of the ISTT system offers no further reduction in COC mobility, or potential for contaminant migration from the TTZ.

3.4 Remedial Technology Evaluation

The detailed remedial technology evaluation for OU-01 is presented in the OU-01 FFS, which is provided as Appendix A of this report. Once thermal treatment was selected as a component of the preferred remedial alternative, Jacobs and Mc2 conducted an evaluation to determine which specific type of thermal treatment would be best suited for OU-01. A brief description of in situ thermal treatment and the different types of ISTT technologies is provided in the following section.

ISTT is an advanced environmental remediation technique that involves the application of heat to the subsurface in order to treat and remove subsurface contaminants. In the case of OU-01, the target contaminants are CVOCs. The primary objective of ISTT is to enhance the volatility, mobility, or destructibility of contaminants by raising the temperature of a defined TTZ. Three methods of ISTT are commercially available for remediation applications:

- Steam enhanced extraction (SEE)
- Electrical resistance heating (ERH)
- Thermal conductive heating (TCH)

These technologies are briefly described as follows:

- **SEE:** SEE is a remediation method that uses steam injection to heat the subsurface. The process involves injecting steam into the soil through injection wells, which raises the temperature of the subsurface. The heat reduces the viscosity of contaminants and increases their volatility, causing them to vaporize or dissolve into the groundwater. The resulting vapor and steam are then extracted through recovery wells, and the contaminants are separated and treated at the surface.
- **ERH:** This technique uses the natural resistance of subsurface materials to electrical current flow to generate heat. Electrodes are strategically inserted into the subsurface, and when an alternating current is applied, the soil's resistance to the current generates heat. As the subsurface temperature rises, contaminants in the soil and groundwater are volatilized and desorbed from soil particles. These vapors are then captured using a vapor recovery system and treated at the surface.
- **TCH:** TCH uses thermal conduction to heat the subsurface. This method involves installing heater elements in boreholes which are driven into the subsurface. The heaters apply a constant source of heat, which is conducted radially into the surrounding soil, raising the temperature of the subsurface. The heat causes contaminants to vaporize, desorb from soil particles, and migrate toward vapor recovery wells, from where they are extracted and treated.

Based on Jacobs and Mc2's evaluation, it was determined that because of the site-specific geology, hydrogeology, and geochemistry of OU-01 (discussed in Section 2), ERH was the best suited technology for the project.

4 Remedy Design and Implementation

This section outlines the tasks related to remedy implementation, including vendor procurement, ISTT system design, permitting, site preparation, system construction, and quality control and quality assurance.

4.1 Vendor Procurement

ISTT is a proprietary technology which is typically designed, constructed and operated by specialty subcontractors. As such, preparation of detailed system designs is completed by the thermal treatment subcontractor. Vendor selection of Mc2 was made following a competitive solicitation released to three commercial suppliers of ISTT services.

Mc2 will furnish all labor, equipment, materials, lower tier subcontractors, supplies, and all else necessary to completely install and operate the ISTT system. All work will be completed in compliance with current federal, state, and local regulations and in accordance with standard industry practice and applicable technology licenses.

4.2 ISTT System Design

Jacobs and Mc2 developed a site-specific ERH system design. The system design is described in the following bullets, and the site-specific design drawings are attached to this report in Appendix B.

- Mc2 has developed a proprietary and patented ERH methodology referred to as Electro Thermal Dynamic Stripping Process (ET-DSP). ET-DSP uses a network of subsurface electrodes to deliver low-frequency three-phase electrical power to the subsurface. The heating process exploits the electric potential gradients between adjacent electrodes to induce current conduction and resistive heat dissipation across the TTZ. The target operating temperature for the system is 90 degrees Celsius (°C). As the subsurface is heated, groundwater and vapors will be extracted from the subsurface through a series of multiphase extraction (MPE) wells and treated.
- Power to the system will be provided by a new electrical service including a 480-Volt transformer and will be distributed to the ET-DSP wells by several power delivery systems that Jacobs and Mc2 will install. Jacobs has coordinated electrical requirements with Jamestown Board of Public Utilities (BPU), including several onsite meetings and teleconferences.
- The placement of the ET-DSP electrodes and MPE wells promotes sufficient temperatures for contaminant vaporization. Jacobs and Mc2's evaluation indicates that 18-foot spacing of electrodes will provide optimal energy input to reach the desired temperature goals for the project. Subsurface heating of CVOC impacted soil and groundwater will result in vapor propagation upward, which will be influenced by subsurface heterogeneities in permeability, resistivity, and transient temperature distribution. Further temperature increases leads to groundwater boiling, generating significant steam and facilitating contaminant transport to the extraction wells. A summary of subsurface elements is as follows and in Table 4-1. A layout of wells and well design details are shown in Appendix B, drawings WFL-01, WCD-01 and WCD-02. Subsurface components of the ISTT system are as follows:
- 196 ET-DSP electrodes will be installed in 102, 10-inch-diameter soil borings.
- Subsurface operating temperature will be measured at 10 subsurface temperature monitoring points. Each temperature monitoring location contains 13 temperature sensors, vertically spaced every 3 feet, totaling 130 temperature monitoring points spatially distributed throughout the TTZ. During system operation, target temperature will be demonstrated and maintained in at least 90% of the subsurface temperature monitoring points.

- A series of 55 MPE wells will be installed throughout the TTZ to extract contaminated groundwater and vapor, and to provide hydraulic control that will prevent contaminants from migrating downgradient.
- 10 pressure monitoring wells to ensure pneumatic control in the TTZ.
- Water is injected into the subsurface near the heating electrodes to enhance convective heat transfer, improving temperature distribution, and the heat promotes vaporization, volatilization, dissolution, and desorption of target contaminants in the subsurface. Injected water will initially be potable water from the onsite water service and may be transitioned to treated reinjected water. Surplus treated water will be discharged to the Jamestown sanitary sewer under a discharge permit held by Dow. As of August 2023, Jacobs is preparing an Underground Injection Control (UIC) permit application for submission to U.S. Environmental Protection Agency (EPA).
- The system includes remote data monitoring for subsurface temperatures, enabling operator response to transient subsurface conditions. The extracted vapors and liquids are treated above ground to remove contaminants before discharge. The heating electrodes will induce increased temperatures starting at roughly 10 feet below grade, so the existing asphalt and concrete structures provide a sufficient vapor seal and natural insulation from ambient air. Accordingly, a constructed vapor cap is not required for OU-01 thermal treatment.
- Once vapors and groundwater are extracted from the subsurface by the MPE wells, both streams will be treated by a phase-specific treatment train that will include vapor-phase and liquid phase granular activated carbon. Following treatment, vapors will be discharged to the atmosphere and treated groundwater not reinjected back into the subsurface will be discharged to the BPU permitted outfall. Jacobs confirmed with NYSDEC that an air emissions permit is not required for this system as long as the requirements in the Guidance on Air Emissions of VOCs at Division of Environmental Remediation (DER) Remediation Sites. On January 26, 2023, Jacobs transmitted a letter to NYSDEC containing data and calculations that document the non-applicability of an air permit for the ISTT system discussed herein. On May 15, 2023, NYSDEC provided a response letter to Jacobs and provided their concurrence of air permit non-applicability for this system. Appendix B shows a process flow diagram of the treatment system. Appendix C provides the Air Emissions Concurrence letter.
- Jacobs and Mc2 anticipate it will take 90 days for the system to reach the target operating temperature. Once the system reaches target temperature, it will operate for an additional period of 90 days. Additional detail on system operations and monitoring is provided in section 5 of this report.
- Once the system has operated for a period of 180-days and conditions presented in Section 3.3.2 have been demonstrated, it will be shut off. The site will undergo a period of monitored cool-down, and the system will be decommissioned and demobilized.
- The existing surface covers will be repaired or restored as part of decommissioning.

4.2.1 Treatment System

Multiphase extraction will be driven by vacuum blowers (refer to drawing PFD-01 in Appendix B) and will be controlled using variable-frequency drives. A butterfly valve and manual dilution air intake adjustment will allow control of the well field vacuum relative to that of the treatment system. The total extraction rate of cooled and dried vapors will be monitored at the discharge point using a pitot tube. Liquid extraction will be controlled by setting the compressed air solenoid triggering timers powering double diaphragm pumps. The total liquid extraction rate will be monitored at the treatment system using a totalizing flow meter, accounting for water reused during backwashing.

In addition to the compressed air solenoids, each extraction well has ball valves that can be used to adjust individual rates of vapor extraction, liquid extraction, and compressed air delivery. Individual vapor extraction rates can be monitored by installing a portable pitot tube assembly in the well extraction, and individual liquid extraction rates can be monitored by temporarily installing a portable knockout assembly

in-line. Temperature, vacuum, and photoionization detector (PID) readings will also be collected manually at the extraction wells to inform their operation.

The treatment system will process two fluid streams: extracted vapors and non-condensable gases; and extracted groundwater, condensate, and NAPLs, if present. Refer to Figure PFD-01 in Appendix B for a process flow diagram of the system with liquid flows (19.9 gpm), vapor flows (360 scfm), liquid carbon media requirements (500 pounds × 3 vessels), vapor carbon media requirements (5,000 pounds × two vessels), and contingency potassium permanganate for VC treatment (3,750 pounds).

4.2.2 Vapor Treatment

Downstream of the initial moisture separator (MS-001), effluent vapors are passed through a shell and tube heat exchanger (HEX-101) fed by a 125-ton cooling tower (TOW-1301). Next, the cooled vapors are fed through an additional moisture separator (MS-002) to remove additional condensate. The effluent vapors are passed through a shell and tube heat exchanger (HEX-104) using a 50% propylene glycol/50% water mixture tied to a chiller (CH-201). Cooled vapors will then pass through the final knockout stage (MS-003) to remove additional condensate. Vapors will pass under vacuum to the dual vacuum blowers (BL-701 and BL-702). Dilution air may be introduced upstream of the blowers if necessary.

Vapors will heat up as they pass through the blowers, so an additional cooling step will take place before carbon treatment. Vapors will pass through a fin-fan heat exchanger (HEX-103) and join with off-gas from the air stripper (AS-601). Two 5,000-pound sacrificial vapor-phase granular activated carbon (VGAC) vessels (VG-801A or VG-801B followed by VG-802 A or VG-802 B) connected in series will be used to capture vapor contaminants. Finally, vapors will pass through a potassium permanganate media-filled vessel (Z-901 or Z-902) for treatment of VC if necessary. Treated vapors will be discharged to the atmosphere using a booster blower (BI-704-110) through a stack (SK-111).

4.2.3 Liquid Treatment

Extracted fluids will be transferred using the multiphase well field piping network to an initial moisture separation tank (MS-001). To reduce the potential for fouling of the liquid treatment system components, MS-001 is a cone-bottom tank allowing extracted solids (sludge) to accumulate at the base of the tank. The sludge will then be pumped using a double diaphragm pump (P-303) to the sludge settling tank (T-501). Sludge will then be further dewatered through a sludge filter and stored in a drum (SD-304). Water will be decanted from both T-501 and SD-304 by pumps P-306 and P-305, respectively. These liquid streams will join the water separated from MS-002 and MS-003 and enter the oil water separator (OWS-401).

If present, light nonaqueous phase liquid recovered by system operation that accumulate in the OWS will be skimmed off the top and dense nonaqueous phase liquids (DNAPLs) will be decanted from the bottom sump into T-503 and T-504, respectively. The recovered water will be pumped to an air stripper (AS-601) to volatilize contaminants dissolved in the liquid stream. The remaining water will pass through a series of double bag filters (BF-1001A/B and BF-1002A/B) to remove particulates in advance of the liquid carbon treatment.

Three 500-pound sacrificial liquid phase granular activated carbon (LGAC) vessels (LGAC-1101, LGAC-1102, and LGAC-1103) will be used to further reduce dissolved contaminant concentrations in water. Treated water from the treated water holding tank (T-505) will be used for backwashing LGAC and potentially for reinjection at the ET-DSPTM electrodes. Excess treated water will be discharged to the existing discharge point under a permit from Jamestown BPU.

4.2.4 Ancillary Equipment

A glycol chiller (CH-201) with a centrifugal transfer pump will be used to supply refrigerated glycol to shell and tube heat exchangers HEX-104. It will be outfitted with a glycol supply tank and temperature and pressure gauges to monitor heat transfer and flow. A continuous duty air compressor (AC-400) will be used to operate the well field slurper tubes and the double diaphragm transfer pumps. It is equipped with a receiver tank with pressure relief valve and pressure regulators for each of the individual service lines (that is, slurpers and double diaphragm pumps).

Table 4-1. Design Summary

Treatment Area (square feet)	17,000	
Heated Area (square feet)	23,360	Based on electrode layout
Heated Volume (cubic yards)	27,670	Based on the TTZ depth 10 to 40 feet bgs with electrodes extending below the TTZ
Depth to Groundwater (feet bgs)	8 to 10	Expected range
Power Delivery System	3×1,330 kVA 1× 660 kVA	Web power control, 480 V primary, multi-tap secondary, subject to availability during procurement
Water Circulation System	3 × 60 channel, 1 × 12 channels	ET-DSP, self-regulating, Internet control
ET-DSP Electrodes	196	Double stacked at 91 locations, 8-inch diameter, 12 feet length shallow and deep electrode configuration (includes angled installations where electrodes are stacked but installed in separate borings) Triple stacked at four locations, 8-inch diameter, 8 feet length shallow, middle, and deep electrode configuration Singled electrodes at two locations, 8-inch diameter, 8 feet length
Electrodes Stacked per Location	1 or 2 or 3	91 locations with 2, 4 locations with 3, and 2 locations with 1
Electrode Spacing (feet)	18	Average, varies slightly across well field
Electrode Depth Interval (feet bgs)	10.3/11.3 to 42	Conductive heat transfer above and below
Target Temperature (°C)	~90	Average in treatment zone to achieve co-boiling of COCs
DigiTAM Temperature Sensors	130	At 10 locations, 13 temperature sensors spaced at 3-foot vertical intervals through the treatment depth

MPE Wells	30 deep/25 shallow/4 angled	4-inch SS304 continuous wire wrap well screen, 0.006-inch slot size (deep zone) and 0.020-inch slot size (shallow zone), combined with slurp tubes. Angled installation is proposed for locations where existing infrastructure make vertical wells impractical. Further, installation of angled wells allows Jacobs to treat more impacted mass compared to using only vertical wells.
Vapor Recovery Air Flow (scfm)	360	Assumes 10-foot vadose zone and 10 pore volume exchanges per day
Cumulative Electrode Input Energy (MWh)	4,991	Based on average power over 180 days project duration
Average Power Input (kW)	1,154	Average for project duration. Peak of ~1,700 kW.
Average Water Demand (gpm)	19.6	Based on ~0.1 gpm/electrode, recirculation design
Average Extraction Rate (gpm)	20.1	Based on an extraction/injection ratio of 1.025
Time to Reach Target Temperature (days)	~90	
Projected Duration of Heating (days)	180	

~ = approximately

kVA = kilovolt-amperes

kW = kilowatt(s)

MWh = megawatt-hour(s)

scfm = standard cubic foot (feet) per minute

4.3 Permitting and Regulatory Compliance

The construction, operation, and demolition of the ISTT system was evaluated for compliance with various environmental statutes and regulations. The review assumes the following basis:

- A multiphase extraction system will be installed that extracts vapors and liquids from the subsurface and conveys them for treatment. New MPE wells and monitoring wells will be installed.
- Soil cuttings, purge water, and decontamination water generated during the work may contain a listed hazardous waste.
- Liquids will be conveyed to a liquid treatment train. Treatment will consist of physical separation or filtration, air stripping, and adsorption.
- The untreated influent contains a listed hazardous waste. The treatment unit is a wastewater treatment unit (WWTU) that is exempt from hazardous waste permitting.
- NAPL and suspended solids will be removed from the wastewater via physical separation or filtration. Separated NAPL, solids, and filtration media will be shipped offsite for disposal.

- Following separation/filtration, the wastewater will be sent through an air stripper. The vapor emissions will be routed to the vapor treatment train. The treated water will continue within the WWTU.
- Following air stripping, the wastewater will be treated via adsorption. The treated effluent will be discharged in accordance with a Clean Water Act Section 307(b) pretreatment permit (Jamestown BPU permit # 26). Adsorption media will be shipped offsite for disposal.
- Some of the treated effluent from the system may be diverted for subsurface injection in accordance with an UIC permit. If this occurs the injected liquid will meet the requirements of the exemption for injection of hazardous waste in Resource Conservation and Recovery Act (RCRA) Section 3023(b).
- Vapors will be conveyed to a vapor treatment train. Treatment will consist of adsorption.
- Extracted vapors and effluent from the air stripping system are considered uncontained gases and are not regulated under RCRA. Vapor emissions will be managed in accordance with NYSDEC guidance.
- Adsorption media will be disposed of at an offsite disposal facility.
- Subsurface heating will require an electrical system upgrade that includes new oil-filled equipment. Injections of water may be needed to facilitate the ERH process. Portable power generators are also expected to be used during construction and for backup power during operation.
- The total oil storage capacity in containers that are 55-gallons or larger will not exceed 1,320 gallons.
- Portable power generators and other engines are expected to be onsite for less than 12 months. They will be operated and maintained in accordance with the manufacturer's specifications.
- Potable water or treated effluent from the ISTT treatment system may be injected to facilitate subsurface heating. This will require an UIC permit.
- Construction activities will only result in minor earth disturbances and potential dust generation.
- The requirements of the Community Air Monitoring Plan (CAMP) will be followed.
- Good management practices will be used to minimize the generation of dust. If needed dust will be controlled using applications of uncontaminated water that will not result in run off.
- Permitting is not required for stormwater discharges or for erosion and sediment control.
- The site will be a large quantity generator of hazardous waste during the work and those requirements will be met.
- Temporary facilities will include portable sanitary facilities, decontamination area, storage and office trailers, and construction material staging area.

The system will incorporate notifications and alarms described in Section 5.1. Additionally, required alarms and notification equipment listed in 6 NYCRR 373-3.3(c) will be present at the site, as described in the *Hazardous Waste Contingency Plan*.

During construction, the sidewalk adjacent to the work area will be closed. A sidewalk closure permit will be obtained from the City of Jamestown for the north portion of OU-01 where electrodes will be installed between Building 5 and Hopkins Avenue.

4.3.1 Waste Management

Liquids that are generated by the MPE system are expected to contain listed hazardous waste. They will be conveyed to a treatment system that meets the definition of a WWTU and is part of a system with a discharge permitted under Clean Water Act Section 307(b); therefore, it is exempt from permitting. The treated effluent is exempt from hazardous waste regulation at the point of discharge.

Other waste that is expected during construction, operation, and demolition includes:

- Soil cuttings
- Groundwater
- Decontamination water
- Treatment media
- Contaminated debris
- Uncontaminated debris

All waste generated during drilling will be appropriately containerized, characterized, and disposed of offsite in accordance with relevant regulations. These wastes will be characterized using a combination of generator knowledge and the procedure in 6 NYCRR 372.2(a)(2). The majority of the waste generated is expected to be characterized as hazardous waste. Waste will be managed onsite and shipped offsite for disposal in accordance with the requirements for large quantity generators of hazardous waste.

4.3.2 Air Emissions

Sources of air emissions associated with construction, operation, and demolition of the system include emissions from portable power generators, fugitive dust, and treated vapor. A CAMP is in place for the site that will be implemented during the construction phase of the project when intrusive activities are planned and during all intrusive activities performed during system operation (for example, soil sampling). The CAMP includes requirements for air monitoring that include dust and VOC monitoring during intrusive activities at the site and will be implemented in accordance with DER-10. Once system shakedown is complete and system operations have normalized, daily system checks, including daily walkabouts with a PID, will be performed to verify that the system is operating as designed. Appendix D provides the project-specific CAMP.

Per 6 NYCRR 201-3.3(c)(29), The emissions from the operation of a remedial system are listed as a trivial activity that is exempt from registration and permitting when required by a consent order and controlled as required by the department. Coordination with NYSDEC was completed between December 2022 and May 2023 regarding the control requirements, as follows.

- On December 1, 2022, Jacobs transmitted a letter to NYSDEC that described the project, the remedial technology to be used, and data and discussion of air emissions permit exemption per 6 NYCRR 201-3.3(c)(29).
- On December 7, 2022, NYSDEC requested more data and information demonstrating that the ISTT system would comply with the Guidance on Air Emissions of VOCs at DER Remediation Sites. This information was provided in a response from Jacobs to NYSDEC dated January 26, 2023.
- On May 15, 2023, NYSDEC transmitted a letter to Jacobs confirming that an air emissions permit is not required for the ISTT system. In this letter, NYSDEC asked that all monitoring records be made available NYSDEC upon request and submitted with the construction documentation.

Each of the documents and letters discussed in this subsection are included in Appendix C.

4.3.3 Underground Injection Control

To facilitate ERH, water (potable or ISTT treatment system effluent) may be injected to the subsurface. Injections of fluid into underground sources of drinking water are regulated under the Safe Drinking Water Act. In New York, the UIC Program is implemented by the EPA, Region 2. Injection wells used for remediation are considered Class V wells. Jacobs, on behalf of Essex, will prepare and submit an authorization request (Appendix E) prior to initiating installation of the ISTT and injection of ground water. There will be no ground surface discharges.

The ISTT treated effluent is a listed hazardous waste that is exempt from RCRA regulation at the Clean Water Act discharge point. However, the same exemption does not apply when the wastewater is injected. RCRA, Sections 3020(a) and 3004, prohibit the underground injection of hazardous waste unless the requirements of an exemption in Section 3020(b) are met. The exemption allows reinjection of contaminated groundwater into the same aquifer it was withdrawn from if the reinjection is performed as part of a federal or state response action, the groundwater is treated to substantially reduce hazardous constituents prior to reinjection, and the corrective action is sufficient to protect human health and the environment. EPA clarified in Office of Solid Waste and Emergency Response Directive #9234.1-06 (1988) and in RCRA Online publication 14512 that the exemption provided by section 3020(b) extends also to the requirements in Section 3004. Additionally, while the treatment must occur prior to reinjection, the substantial reduction in hazardous constituents may occur either before or after reinjection. The ISTT system, as described herein, meets the requirements for the exemption under Section 3020(b) because extracted groundwater will be treated by separation, air stripping, and adsorption to substantially reduce the hazardous constituents prior to reinjection. The response action is taking place under state authority and is sufficient to protect human health and the environment.

4.3.4 Clean Water Act

The ISTT treatment system is a WWTU that is subject to an industrial wastewater discharge permit issued by the City of Jamestown BPU in accordance with Clean Water Act Section 307(b) and the Jamestown Sewer Use Ordinance (Appendix F). Best management practices will be implemented as required by the permit.

No significant grading or earth disturbing work is included in the project. Additionally, materials will be stored inside to the extent possible and no construction stockpiles containing soil are anticipated. Therefore, no stormwater permitting is required for construction, operation, or demolition.

4.3.5 Protected Species and Habitat

The Site as a whole and specifically OU-01 are developed urban locations with little to no suitable habitat. No protected species or habitat have been identified other than migratory birds. Over 800 species of native birds are protected by the Migratory Bird Treaty Act and these birds may be present at any time. To minimize the risk of an accidental take, equipment will be routinely inspected for birds and nests. Preventative measures to discourage nesting such as routine site walks, routine movement of mobile equipment, spikes, and nets may be implemented.

4.4 Site Preparation

Site preparation activities will include mobilization of personnel and equipment to the work site and establishment of temporary facilities, portable sanitary facilities, decontamination area, storage trailers, and construction material staging area. The location of the main staging area is located south of the Plant 5 Building, with additional equipment and materials being staged in the Plant 5 building and north parking lot. Site controls (such as access barricades, flagging, fencing, and signs) will be installed or upgraded to control unauthorized access to the site. The various work areas for site activities will be clearly marked and flagged. A security system including cameras will be installed to provide remote monitoring of the site.

Since electricity is a major consumable for this technology, the utility service will be upgraded, as needed, to support system operation. Electrical service specification and planning will be coordinated with Jamestown BPU, who is providing the primary power service and required transformer.

Prior to system construction, existing wells within the TTZ must be abandoned per NYSDEC Policy CP-43 abandonment procedures, as any wells constructed of polyvinyl chloride would melt during ISTT operation. Table 4-2 lists the wells that will be abandoned prior to system construction; Figure 8 shows these wells. Select wells in Table 4-2 are also part of the annual groundwater monitoring program per the site management plan. Following completion of this project, the site management plan (SMP) and groundwater monitoring program will be reevaluated.

Table 4-2. Existing Monitoring Wells to be Abandoned.

Monitoring Well ID	Northing	Easting	Top of Casing Elevation (feet amsl)	Depth to Top of Screen (feet)	Depth to Bottom of Screen (feet)	Screened Zone
GP-1S	769418.53	977328.64	1278.34	8	12.8	Shallow
GP-2D	769380.34	977348.27	1278.03	30	34.8	Deep
GP-2S	769379.13	977344.67	1277.97	2.6	12.6	Shallow
GP-3D	769435.18	977388.08	1278.15	34	38.8	Deep
GP-3S	769439.01	977385.71	1278.25	4	14	Shallow
GP-4D	769400.36	977281.12	1277.48	39	43.8	Deep
GP-4S	769402.76	977283.85	1277.43	10.8	15.8	Shallow
GP-5D	769467.41	977310.00	1276.30	36	40.8	Deep
GP-5S	769466.37	977307.37	1276.79	7	11.8	Shallow
HW-6	769321.82	977304.10	1280.98	6	16	Shallow
HW-6A	769317.15	977304.53	1279.85	--	--	--
MW-10	769402.92	977316.21	1277.28	8.5	18.5	Shallow
MW-12	769328.16	977258.42	1277.51	4	14	Shallow
MW-20	769381.21	977365.24	1278.10	6.5	11.5	Shallow
MW-21D	769507.36	977414.36	1275.61	31.5	41	Deep
MW-101S	769495.85	977385.68	1275.68	8	18	Shallow
MW-111D	769320.09	977274.77	1277.59	32	42	Deep
MW-118D	769419.08	977325.34	1278.15	24	34	Deep
MW-123D	769431.82	977294.35	1276.86	25	35	Deep
MW-6	769420.79	977237.79	1277.28	9.9	19.9	Shallow
MW-7DD	769435.52	977293.59	1277.09	90	100	Glacial Till
MW-7S	769440.65	977291.06	1277.04	10	20	Shallow
PZ-1D	769442.95	977285.37	1277.23	25	45	Deep
PZ-1S	769443.57	977282.97	1277.25	7	17	Shallow
PZ-2D	769442.57	977286.80	1277.14	25	45	Deep

Monitoring Well ID	Northing	Easting	Top of Casing Elevation (feet amsl)	Depth to Top of Screen (feet)	Depth to Bottom of Screen (feet)	Screened Zone
PZ-3D	769416.94	977325.13	1278.35	20	40	Deep
PZ-4D	769419.63	977320.19	1278.24	25	45	Deep
VP-1S	769423.04	977327.44	1278.26	--	--	Shallow
VP-2S	769410.90	977332.10	1278.32	--	--	Shallow
VP-3S	769320.40	977328.50	--	--	--	Shallow
VP-8D	769465.51	977305.11	1276.69	20	39	Deep

amsl = above mean sea level

ID = identifier

4.5 System Construction

4.5.1 Subsurface Construction

Construction of the in situ system components will require soil borings in accordance with the design drawings in Appendix B. Subsurface borings will be installed using rotosonic drilling methods, with the exception of single- and triple-stacked electrodes located in low-clearance areas, which will be installed by hollow stem auger drilling methods. Select borings will be installed at an angle to allow access to areas of the TTZ located beneath existing surface structures that makes vertical installation of wells impractical. Subsurface infrastructure associated with the ISTT system will be constructed according to the design drawings in Appendix B. Any deviations from the design will be approved by the design team and documented. A Jacobs geologist will oversee each boring to confirm subsurface conditions are consistent with the site conceptual model and to document the specific installation details alongside Mc2. A construction/quality control log will be completed for each installation. An as-built survey of the well locations will be completed to document the installation. This documentation will be included in the construction completion report developed following completion of construction activities.

4.5.2 Surface Construction

Construction of the surface components of the ISTT system will commence following completion of the drilling program. Surface components include the wellfield piping network, fluid extraction and treatment system, liquid injection system, and electrical distribution system.

The wellfield piping network will consist of chemically rated hoses, steel piping and pipe stands to collect, combine and transport extracted fluids to the extraction and treatment system. The extraction and treatment systems will be a modular, prefabricated treatment systems installed in steel containers (sea boxes) that will be interconnected after delivery to the site. Water injection hoses will be laid out and connected to each electrode, then organized and wrapped in insulation and heat trace for outdoor locations. The process flow diagram is presented as drawing PFD in Appendix B. Jacobs will provide oversight of all field construction tasks to confirm the specifications and system design objectives are met. Documentation of surface construction will be included in the construction completion report developed following completion of construction activities.

The electrical components will be placed according to system design drawings and interconnecting cables and power conductors will be laid out and connected by licensed electricians. All installations, equipment model numbers and other details will be checked versus the final design drawings.

All waste generated during drilling will be appropriately containerized, characterized, and disposed of offsite in accordance with relevant regulations as presented in Section 4.3.1.

4.6 Construction Quality Assurance

Jacobs will establish a Construction Quality Management Plan (CQMP) for the project. The document will present procedures for Construction Quality Assurance (CQA) that will be implemented to monitor and control the quality of the construction of the ISTT system. The CQA will include daily inspections of installation activities including:

- Layout of drilling locations by a licensed surveyor
- Electrode and screen depths
- Piping sizing and pitch
- Treatment equipment package including pumps, tanks, blowers, etc.
- Electrical wire and cable
- Electrical distribution equipment

A Jacobs construction manager will be onsite during installation of the entire system to document the CQA process and that system specifications and procedures have been met by Mc2 and their subcontractors. CQA documentation will be included in the construction completion report developed following completion of construction activities.

4.7 Construction Quality Control

As part of the CQMP, a Construction Quality Control (CQC) will be implemented to provide assurance that all aspects of the ISTT construction meet design requirements. The CQC plan, including a pre-system safety review, will consist of a detailed system testing and commissioning that will test the functionality, set points and alarms associated with all equipment including pumps, level sensors, temperature sensors, flow meters and other process sensing devices. Jacobs' construction managers will oversee the above tasks and document completion in accordance with the specifications and design documents, CQC documentation will be included in the construction completion report developed following completion of construction activities.

5 Remedy Operation

Performance of the ISTT system will be monitored from the onset of operations. Multiple parameters will be measured for the specific purpose of evaluating the following:

- Remedy efficacy
- Contaminant mass removed
- Estimated operating time remaining before diminishing returns for mass removal occurs

Data obtained during system operation will be used to guide decision making in near real time, including a determination of whether the ISTT system is functioning as designed (that is, are target temperatures achieved). Table 5-1 provides a summary of monitoring activities, including analytical samples collected during ISTT system operation. The following sections provides monitoring rationale for key system parameters.

5.1 System Operation

It is estimated that the ISTT system will be operated for approximately 180 days. It will take approximately 90 days to reach the target subsurface temperature, then operations will continue at the target temperature for an estimated 90 days. Estimated durations are based on subcontractor experience and calculations; however, the actual period of operation may be longer or shorter and will be influenced for system monitoring for diminishing returns as outlined in Section 3.3. The diminishing returns strategy applied during system operations is intended to guide thermal treatment processes in a manner that maximizes contaminant removal but also balances the practical and physical limitations for contaminant reduction that are inherent with all in situ remediation systems. During system operations the measurement of subsurface temperature, contaminant mass removal and energy input will be used to determine the point for diminishing returns of continued ISTT system operation. The approach is intended to allow project stakeholders the required flexibility to determine the optimal shutdown point while simultaneously balancing technology implementation cost and remedial goal achievement.

By assessing ISTT system performance through direct observation of subsurface temperature and contaminant mass recovery, complementary lines of evidence will be generated to define and document where the input of additional thermal energy or extended system operation will not yield a demonstrable reduction in contaminant mass in soil and groundwater. Once it is determined from performance monitoring that:

- Heating of the source area using ISTT has reached an asymptotic rate of contaminant recovery
- That additional input of subsurface energy will not increase contaminant mass removal rate
- Extended operation of the ISTT system offers no further reduction in contaminant mobility within the aquifer, the decision to shut down operation of the ISTT system will be made

The ISTT will incorporate an alarm system. Yellow alarm and red alarm conditions will both be programmed based on instrumentation readings and will result in partial or full shutdown of the system, respectively. Alarm notifications will be sent to the project control monitors and automatically to system operators by call-out, email, or text message. Operators will be able to respond to alarms immediately during business hours, or within an hour during nonbusiness hours.

An overview of proposed monitoring systems and data interpretation are presented in the sections that follow.

5.1.1 Thermal & Electrical System Monitoring

This section describes the monitoring of the thermal system.

5.1.1.1 Temperature

In the application of ISTT, subsurface temperature is a key parameter monitored throughout system operation. Thermal monitoring points (TMPs) will be installed inside and outside the treatment area using roto sonic drilling equipment. The TMPs will be installed several feet away from the heating equipment to ensure that the bulk soil temperature is monitored.

At each TMP, subsurface temperatures will be monitored every 3 feet within the vertical profile of the TTZ. TMPs will be monitored in real time to ensure that the entire TTZ is heated to the target temperature. If cool zones are detected, additional power can be delivered to these zones.

5.1.1.2 Mass Removal

The flows of extracted liquid and vapor are critical operational parameters for the system and these data will be measured by system instrumentation and electronically recorded throughout the duration of ISTT equipment operation. To document COC mass removed, extracted groundwater and vapor samples will be collected weekly for COC analysis for in an offsite laboratory. Using these analytical results and the measured extraction rate for vapor and groundwater, the COC mass removed by the system will be calculated. Vapor mass recovery will be tracked daily during system operation by measuring the extracted vapor composition using a non-selective monitoring instrument, such as PID, and multiplying by the measured extracted volume. If NAPL is extracted during system operation, contaminant mass will be calculated from the volume and the specific gravity of the NAPL recovered.

5.1.1.3 Energy

In addition to COC recovery and subsurface temperature, energy input and energy extracted through the removal of soil vapor, steam and groundwater from the treatment area will be evaluated to ensure that a sufficient quantity of energy was used to reach and maintain the target subsurface temperatures in the treatment zone. Energy input to the subsurface will be tracked in real time during operation of the thermal treatment system. Through comparison of the energy input and corresponding energy removed in extracted groundwater and vapor, an energy balance can be constructed. Subsurface energy input and more specifically the corresponding temperature change is the primary mechanism responsible for contaminant removal. Therefore, the energy balance serves as a fundamental line of evidence in tracking and demonstrating diminishing returns by the ISTT system.

5.1.1.4 Pressure

Subsurface pressure monitoring will also be integrated in ISTT system operation. By establishing and monitoring subsurface pressure in the treatment area, the efficacy of the soil vapor collection system can also be demonstrated. Subsurface pressure will be measured in the vacuum monitoring wells shown in Appendix B. Measurements will be collected weekly using a manual pressure/vacuum device. Adjustments to the vapor extraction rates will be completed to optimize subsurface pressures and maintain vapor control.

5.1.1.5 Water Extraction and Injection

Water extraction and injection will be monitoring continuously using a totalizer. The ratio of the total volumes of extraction and injection water will be monitored and maintained at 1.025 or greater, which indicates an inward hydraulic gradient is maintained.

5.1.2 Performance Monitoring and System Shutdown

Although numerical models used in detailed design are effective for estimating the required treatment time, the required timeframe for ISTT system operation cannot be predicted with confidence due to uncertainties in COC distribution and mass. Similarly, the mass of COCs and NAPL present in the treatment area and the rate at which COCs may be recovered by the ISTT system are also unpredictable. Therefore, the most effective implementation of this treatment technology will come only through direct observation of system performance. Direct observations of COC recovery and subsurface temperature during ISTT system operation will determine when the input of additional thermal energy or extended system operation will no longer yield a significant reduction in COC mass in soil and groundwater. These performance observations also define the point of diminishing returns and most importantly when system operation should be terminated.

Vapor monitoring will be performed in accordance with Table 5-1. In addition, a walkabout of the Site with a PID will be part of the daily operation of the system. Monitoring frequencies were selected to allow tracking of system trends and to identify any changes in the monitored parameters in a timely fashion to allow for adjustments in system operations.

The performance standard for the ISTT system operation will be based on a diminishing returns concept, which assures the project stakeholders the flexibility in achieving the corrective action objectives for proposed treatment areas while simultaneously balancing technology implementation cost to determine the optimal shutdown point. Diminishing returns for system operation will be documented through the following observations:

- Subsurface Temperature Response – In situ thermal monitoring results will confirm that the co-boiling temperature of the target contaminants and water has been reached and maintained in the treatment volume to remove the maximum practicable mass of COCs.
- Contaminant Mass Flow Rate – The mass flow rate of COCs extracted in soil vapor and groundwater has approached a steady state, non-zero value (indicative of an asymptotic recovery rate).
- Cumulative Energy Balance – The energy input to the treatment areas was sufficient to achieve and maintain subsurface temperatures above the co-boiling point of the target contaminants and water within the saturated zone.
- Overall System Performance – The collective monitoring results for vapor concentrations, energy input, and subsurface temperature indicate that the input of any additional thermal energy will not yield a significant reduction in remaining COC mass.

The ISTT system will be operated for a minimum of 180 days. Following that period, Dow may elect to continue operation if performance monitoring data indicate that continued treatment is both necessary to achieve the treatment objective as well as economically feasible. Considerations of the data will include:

- Treatment of the source area using ISTT has reached an asymptotic rate of COC recovery
- Additional input of subsurface energy will not increase COC mass removal rate
- Continued operation of the ISTT system offers no further reduction in COC mobility, or potential for contaminant migration from the TTZ

To assist in ISTT performance evaluation, soil samples will be collected within the TTZ prior to the completion of operations. Soil boring locations will be biased in locations with previously observed highest concentrations, with additional locations near the edges of the TTZ. Up to 14 soil borings will be advanced throughout the TTZ as feasible given piping, cable, wellheads, building access points and other obstructions. Soil samples will be collected from the top three geologic intervals including intervals previously resulting in TCE concentrations greater than 25 mg/kg. Four or five soil samples will be collected from each boring at depths ranging between 8 and 38 feet bgs depending on the location. A PID and headspace soil screening techniques will be used to identify the specific intervals from which samples are collected. The soil samples will be used to assess system performance and whether additional operations could potentially achieve enhanced mass recovery in select areas; these samples will only represent an additional tool to support the timing of system shutdown.

Table 5-1. System Operations Monitoring Summary

Parameter	Media	Location	Method	Frequency
Electrode System Monitoring				
Temperature	Subsurface	Temperature monitoring points	Automatic polling of thermocouples	Hourly
Vacuum	Subsurface	Vacuum monitoring Points	Vacuum gauge (manual)	Weekly
Energy	Electrical power	Primary transformer	Automatic data logging	Daily
Volume	Water injected	Electrode control	Flow totalizer	Daily
	Water extracted	Treatment influent		Daily
Treatment System Monitoring				
Temperature	Extracted fluids	Extraction wells, treatment system	Temperature sensor	Daily
Vacuum	Vapor extracted	Extraction wells	Vacuum gauge (manual)	Daily
Flow Rate	Vapor extracted	Treatment influent	Averaging pitot tube	Daily
	Vapor discharged	Treatment effluent		
Vapor VOCs	Vapor extracted	VGAC influent sample point	PID (manual)	Daily
	Vapors treated	Treatment system VGAC mid-fluent sample point	PID (manual)	Daily
	Vapor discharged	Treatment system VGAC effluent sample point	PID (manual)	Daily
	Ambient Air	Treatment area and immediate vicinity	PID (manual)	Twice per week

Parameter	Media	Location	Method	Frequency
Flow Rate	Condensate (liquid)	Liquid treatment system influent	Flow totalizer	Daily
Volume	Treated water discharge	Treatment effluent	Flow totalizer	Daily

Mass Removal Measurements

Volume	DNAPL (if recovered)	System knockout pots	Thickness (manual)	Weekly
Vapor VOCs (Analytical Laboratory)	Vapors extracted	Treatment system – VGAC influent	Tedlar bag or canister vapor sample (manual)	Weekly
	Vapors treated	Treatment system – VGAC mid-fluent	Tedlar bag or canister vapor sample (manual)	Weekly
		Treatment system – VGAC effluent	Tedlar bag or canister vapor sample (manual)	Weekly
Aqueous VOCs (Analytical Laboratory)	Liquids treated	Treatment system – Influent	Pump or valve (manual)	Biweekly
		Treatment system – first sacrificial LGAC vessel effluent		Biweekly
		Treatment system – system effluent		Biweekly

Mass Removal Measurements

Soil VOCs (Analytical Laboratory)	Soil Samples	Target Treatment Zone	Direct Push Technology Sampling	Once before end of operations

DNAPL = dense nonaqueous phase liquid

LGAC = liquid phase granular activated carbon

VGAC = vapor-phase granular activated carbon

5.1.3 Demobilization

During demobilization, temporary facilities, utilities, and equipment will be removed from the site. Any debris or solid waste material remaining from the field activities will be removed, characterized and properly disposed of. The heater wells/electrodes, vapor recovery wells, and conduits will either be removed or abandoned in place in accordance with NYSDEC CP-43 as applicable. Asphalt and concrete pavement will be placed in areas where it was previously removed or damaged to implement the remedial action to properly re-establish the engineering controls. The Site will be restored to preconstruction conditions.

5.2 Post-thermal Treatment Sampling

Following completion of the ISTT demobilization, post-thermal treatment groundwater monitoring program will be implemented at new wells installed within the OU-01 TTZ and at existing wells within the downgradient plume (OU-03). These wells will be sampled at a semiannual frequency for the first 2 years and then at an annual frequency for at least 3 additional years after thermal implementation. This sampling plan will be submitted as part of a revised SMP for OU-1.

Soil sampling outside the proposed system performance monitoring plan is not currently planned. However, it will be considered in the future as a means for assessing remaining impacts or attainment of SCOs after the post-thermal performance monitoring period, if MNA does not appear to be effective.

The post-remedy vapor intrusion potential will be assessed and remediated, if necessary.

6 Submittals

A *Construction Completion Report* prepared in accordance with NYSDEC DER-10 Section 5.8 will be submitted to NYSDEC after the completion of all field activities. The report will document the activities completed in accordance with the remedial design and ROD, in addition to providing supporting data and other information listed in DER-10. A revised SMP will be developed and submitted to NYSDEC that presents the post-thermal groundwater monitoring plan.

7 Health and Safety

Worker health and safety will be of the utmost importance during implementation of this project. A detailed project-specific *Health and Safety Plan* (HSP) will be prepared before field work. The HSP will include a detailed description of the work and will identify the equipment, materials, and personnel required to perform the work. In addition, the HSP will include an inventory of chemicals that will be used onsite, along with Safety Data Sheets for each. The HSP shall specify chemical storage and handling procedures, including personal protective equipment (PPE) required for each task involving potential chemical exposure. Mc2 will also develop an HSP specific to its and lower tier subcontractors activities.

The work is expected to be performed in Level D personal health and safety protection, with impermeable steel toe/steel shank work boots, eye protection, hard hats, traffic safety vests, and appropriate gloves. Hearing protection shall be worn as needed. PPE will be upgraded if action levels presented in the HSP are exceeded.

All field personnel will have at least 40-hour HAZWOPER training, current 8-Hour refresher training, and coverage under an annual medical surveillance program for all site workers who may enter the exclusion zone prior to the start of work on the project. Workers without the required documentation will not be allowed to work onsite except in support areas. Proof of completion of training and certification will be collected before the commencement of work and these records shall be maintained at the site.

8 Project Schedule

Table 8-1 provides key project schedule milestones for ISTT implementation. The project schedule will be adjusted routinely to reflect when milestone dates have been achieved.

Table 8-1. Schedule Milestones

Milestone	Start	Complete	Estimated Duration
Design	December 2022	August 2023	7 months
Subsurface Construction	September 2023	December 2023	2.5 Months
Surface Construction	December 2023	January 2024	1.5 Months
System Testing and Commissioning	January 2024	January 2024	1 Week
Operations	January 2024	July 2024	6 Months
System shutdown	July 2024	July 2024	3 Weeks
System Decommissioning and Demobilization	August 2024	September 2024	1.5 Months

9 References

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Figure 1 Site Overview Map

Figure 2 Site Features Map

Figure 3 Shallow WBZ Groundwater Plumes

Figure 4 Deep WBZ Groundwater Plume

Figure 5 Soil Impacts

Figure 6 Target Treatment Zone Boundary

Figure 7 TCE 25 mg/kg Plume Shell with Geology Cross Section

Figure 8 Wells for Abandonment

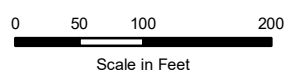


- Approximate OU-01 In Situ Thermal Treatment Project Area Boundary
- Approximate OU-01 Site Boundary as defined by the July 2023 Order on Consent
- Parcel

Note:
Offsite area outside of OU-01 boundary is identified as OU-03. Exact boundary of OU-03 is to be determined.



BASE MAP SOURCE:
Bing Aerial Imagery 2022



Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 1
Site Overview Map
Remedial Design

CREATED BY: LA	Jacobs
REVIEWED BY: JK	

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 Approximate OU-01 In Situ Thermal Treatment Project Area Boundary

 Parcel

Note:
Offsite area outside of OU-01 boundary is identified as OU-03. Exact boundary of OU-03 is to be determined.



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BASE MAP SOURCE:
Bing Aerial Imagery 2022

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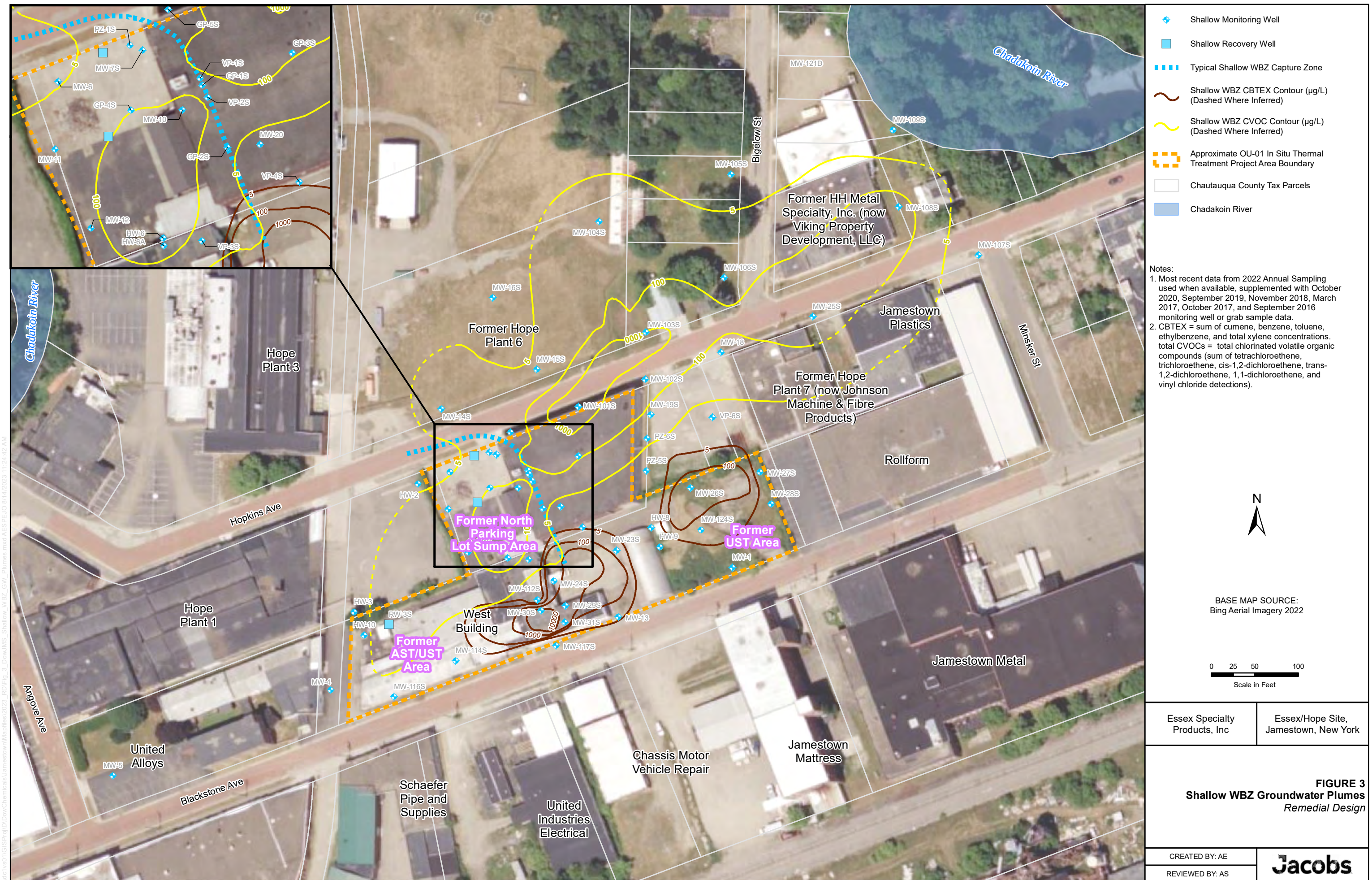
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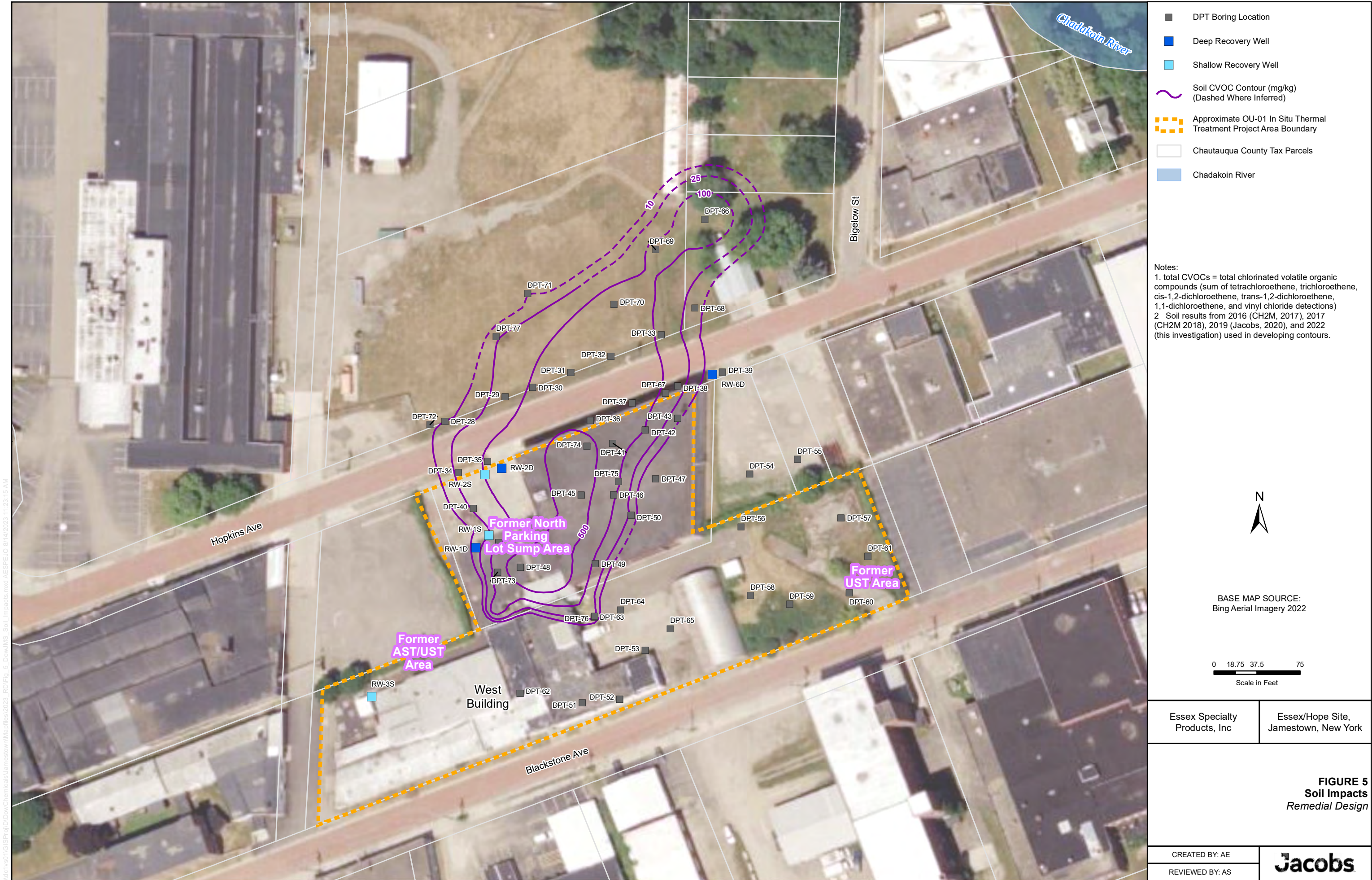
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Scale in Feet

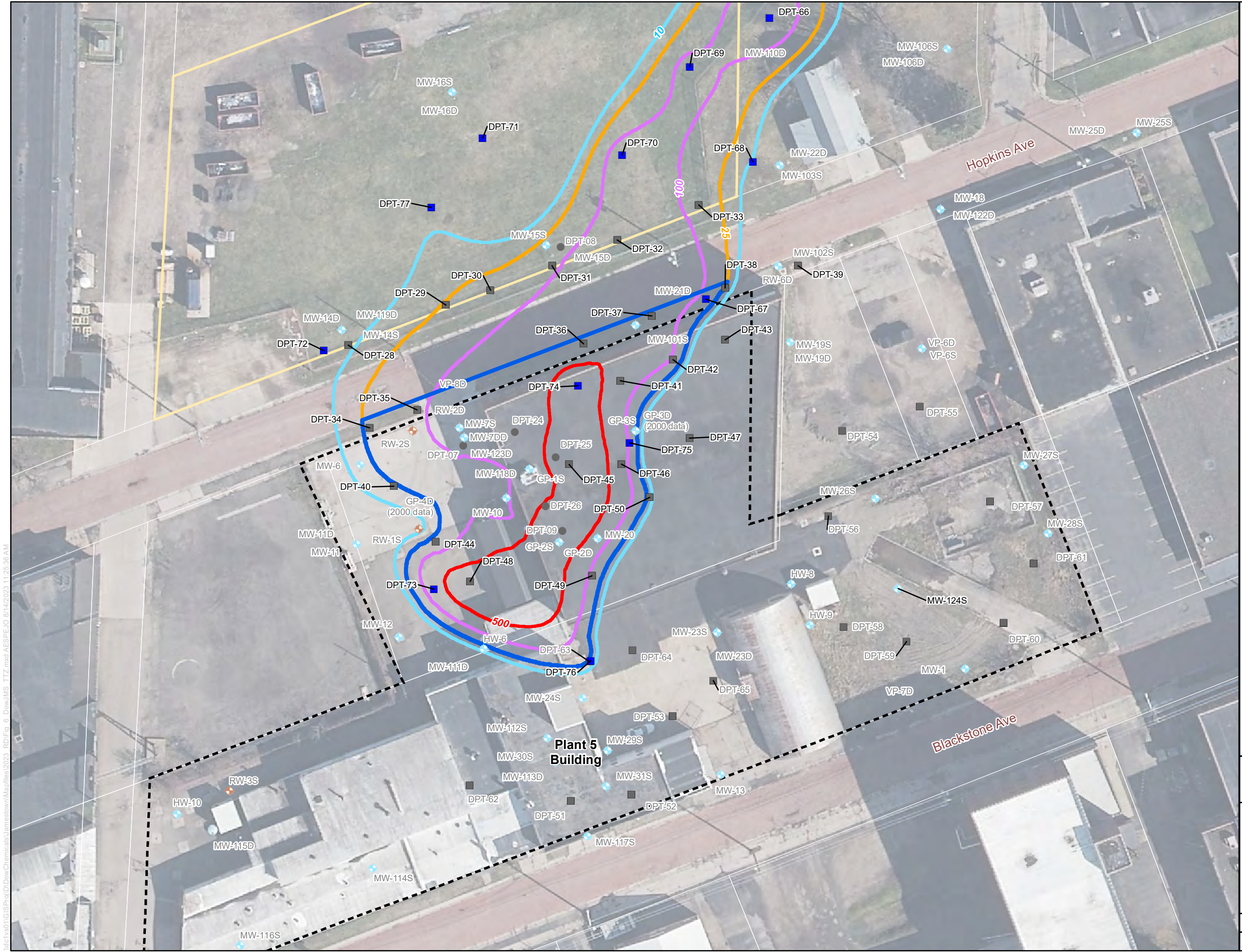
Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York
FIGURE 2 Site Features Map Remedial Design	
CREATED BY: LA	
REVIEWED BY: JK	

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- Target Treatment Zone (19,563 ft sq)
- Former Hope Plant 6 Area
- Approximate OU-01 In Situ Thermal Treatment Project Area Boundary

- Sampling Locations**
- Deep Monitoring Well
 - Shallow Monitoring Well
 - Recovery Well
 - Direct Push Location
 - DPT Boring Location
 - 2022 DPT Boring Location

- TCE Isoconcentration Contours (mg/kg)**
- 10
 - 25
 - 100
 - 500

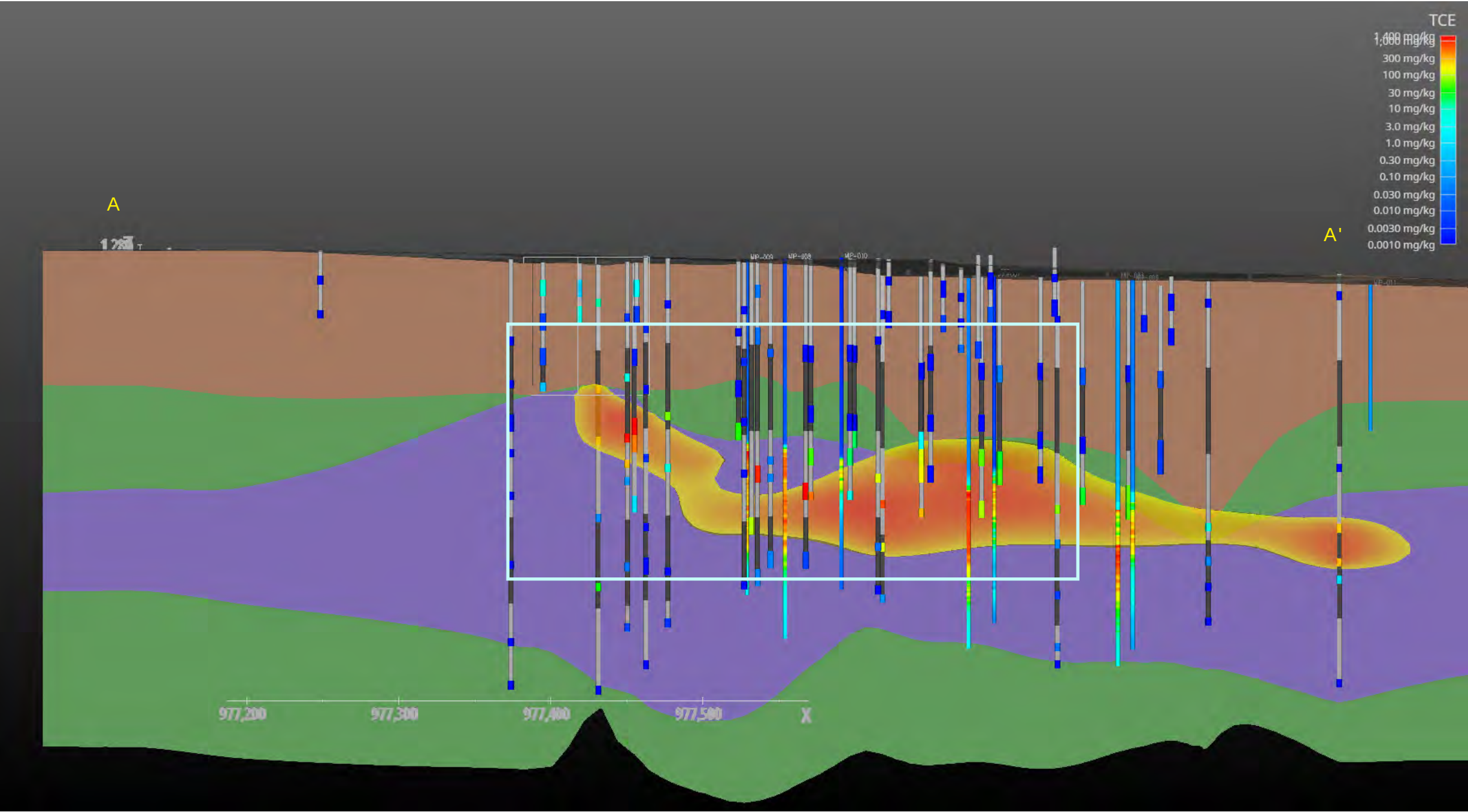
BASE MAP SOURCE:
NYS Office of Information Technology Services,
GIS Program Office, Obtained: Feb 2019.

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Scale in Feet

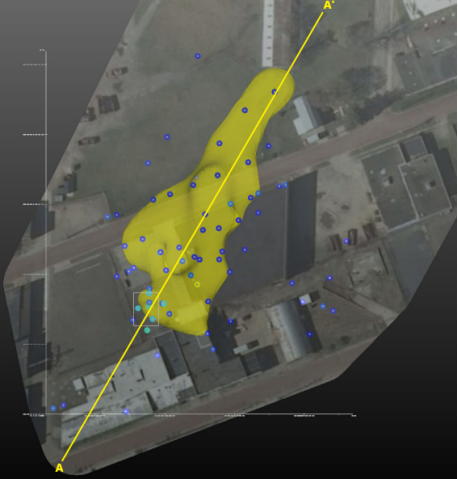
Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 6 Target Treatment Zone Boundary <i>Remedial Design</i>	
CREATED BY: AE	
REVIEWED BY: DR	

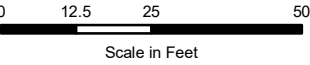
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- Legend:**
- Total TCE 25 mg/kg in soil modeled plume shell
 - Former remedial excavation area
 - Target Treatment Zone
- Notes:**
- Discrete soil samples represented by wide cylinders with concentration results shown per color scale.
 - MIP results show represented by narrow cylinders with color scale. MIP response scale does not correspond to concentration color scale.
 - mg/kg = milligrams per kilogram
 - MIP = membrane interface probe
 - TCE = trichloroethene



Images obtained using Earth Volumetric Studio (EVS)
Version 2020.5.2



Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 7
TCE 25 mg/kg Plume Shell with
Geology Cross Section
Remedial Design Report
In Situ Thermal Treatment

CREATED BY: MG	Jacobs
REVIEWED BY: JK	



Monitoring Well

Site Boundary

Chautauqua County Tax Parcels

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BASE MAP SOURCE:
Imagery: Statewide Digital Orthoimagery 2016 of
Chautauqua County, New York Stat Gov 2016;
Tax Parcel Source: Chautauqua County
Department of Information Services. Last updated
July 7th, 2017.

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Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York
FIGURE 8 Wells for Abandonment	
CREATED BY: AE	Jacobs
REVIEWED BY: AS	

Appendix A

Focused Feasibility Study



Focused Feasibility Study

Essex Specialty Products, LLC

Operable Unit 01 - Essex-Hope Site, Jamestown, New York

August 8, 2023



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Acronyms and Abbreviations

µg/L	microgram(s) per liter
AS	air sparging
AST	aboveground storage tank
bgs	below ground surface
COC	constituent of concern
CPM	Custom Production Manufacturing
CVOC	chlorinated volatile organic compound
DER	Division of Environmental Remediation
Dow	The Dow Chemical Company
ERH	electrical resistance heating
Essex	Essex Specialty Products LLC
FFS	Focused Feasibility Study
gpm	gallon(s) per minute
IRM	interim remedial measure
ISCO	in situ chemical oxidation
ISTT	in situ thermal treatment
mg/kg	milligram(s) per kilogram
NA	natural attenuation
NAPL	nonaqueous phase liquid
NPLS	north parking lot sump
NYCRR	<i>New York Codes, Rules and Regulations</i>
NYSDEC	New York State Department of Environmental Conservation
O&M	operations and maintenance
OU	operable unit
PCB	polychlorinated biphenyl
RAO	remedial action objective
ROD	Record of Decision
SCG	standards, criteria, and guidance
SCO	soil cleanup objective
Site	Former Essex-Hope State Superfund Site located at 126 Hopkins Avenue in Jamestown, New York

SVE	soil vapor extraction
SVOC	semivolatile organic compound
TCE	trichloroethene
TTZ	target treatment zone
UI	United Industries, Inc.
UST	underground storage tank
VI	vapor intrusion
VOC	volatile organic compound
WBZ	water-bearing zone

1. Introduction

Jacobs has prepared this Final Focused Feasibility Study (FFS) on behalf of Essex Specialty Products LLC (Essex), a former subsidiary of The Dow Chemical Company (Dow). The purpose of the FFS is to evaluate alternative approaches to meet established remedial action objectives (RAOs) for Operable Unit (OU) 01 at the Former Essex-Hope State Superfund Site located at 126 Hopkins Avenue in Jamestown, New York (Site). The Site, presently owned by United Industries, Inc. (UI), is listed under the New York Superfund Program (Site Number 907015) and managed by the New York State Department of Environmental Conservation (NYSDEC). A Record of Decision (ROD) was issued in 1994 prescribing the implementation of remedial actions at the Site (NYSDEC 1994).

The FFS was first submitted to NYSDEC in draft form on December 16, 2022, to provide NYSDEC the opportunity to review the document. On January 24, 2023, NYSDEC provided feedback and commentary via a letter emailed to Jacobs and Dow. Following receipt of NYSDEC's comments and feedback on January 24, 2023, a teleconference was held on February 6, 2023, with NYSDEC, Jacobs, and Dow representatives in attendance to discuss the feedback on the Draft FFS and the path forward for the Site. On February 10, 2023, NYSDEC provided Jacobs and Dow an update via email regarding NYSDEC's proposed path forward for the Site. NYSDEC decided to separate the onsite and offsite remedial programs into separate OUs. The OU structure NYSDEC proposed includes the following:

- OU-00 – Site Management
- OU-01 – Onsite Remedial Program (revised to Onsite)
- OU-01A – Interim Remedial Measure (IRM) Soil Removal
- OU-02 – Residential Vapor Mitigation System
- OU-03 – Offsite Remedial Program

The FFS was revised to account for the new OU structure of the Site; this document only provides a discussion and evaluation of OU-01. Future documents will discuss and evaluate the other OUs (OU-00, OU-01A, OU-02, and OU-03). In addition, the FFS was revised to account for NYSDEC's comments on the Draft FFS, which were transmitted to Jacobs and Dow via emailed letter on January 24, 2023. The revised FFS was submitted to NYSDEC on April 18, 2023. NYSDEC responded with additional comments on July 5, 2023. This submission incorporates those comments.

1.1 Purpose and Objectives

A significant amount of investigation and remedial work has been performed at the Site since the early 1990s. Although remedial activities completed to date have removed significant chlorinated volatile organic compound (CVOC) and petroleum-related compound mass, resulting in an overall reduction of CVOC and petroleum-related compound concentrations in soil and groundwater, elevated concentrations of Site-related contaminants still remain. Significant investigation efforts as part of a multiphase Supplemental Investigation identified that Site impacts are significant, both in concentration magnitude and extent, and that previous and ongoing remedial efforts, although beneficial, appear unlikely to achieve the RAOs for OU-01 in the foreseeable future. Accordingly, the objective of this FFS is to evaluate a more technologically effective and timely remedial alternative that will achieve RAOs for OU-01 in an acceptable time frame while ensuring continued protection of human health and the environment during remediation.

1.2 Report Organization

This report is organized as follows:

- **Section 1 – Introduction:** Presents the purpose of the report.

-
- **Section 2 – Physical Site Setting:** Presents a description of the Site and geologic and hydrogeologic conditions at the Site and provides an overview of the Site's environmental conditions.
 - **Section 3 – Remedial Background:** Summarizes Site-specific RAOs for OU-01 and provides an overview of previous and ongoing remedial actions completed at the Site.
 - **Section 4 – Development of Remedial Alternatives:** Presents the background on the OU-01 alternatives this FFS discusses.
 - **Section 5 – Analysis of Remedial Alternatives:** Presents an overview of the analysis of the remedial alternatives evaluated for OU-01 as part of this FFS against nine evaluation criteria.
 - **Section 6 – Summary:** Summarizes the evaluation of the OU-01 alternatives.
 - **Section 7 – References:** Presents materials cited in this report.

2. Physical Site Setting

This section provides a description of the Site, including Site geology and hydrogeology, and an overview of Site contamination.

2.1 Site Description

The Site is located in a highly industrialized area with numerous metalworking shops and other manufacturing facilities. The OU-01 site boundary as defined by the July 2023 Order on Consent is presented on Figure 2-1. However, the area defined as OU-01 and the focus of this FFS is presented on Figure 2-1a. The property to the north of the Site, beyond Hopkins Avenue, is an undeveloped field previously occupied by Hope Windows Plant 6. To the east and northeast toward the Chadakoin River are several commercial properties or metalworking shops (Viking Property Development LLC [formerly H&H Metal Specialty Inc.], Johnson Machine, and Rollform), as well as several residences along Bigelow Street and Hopkins Avenue. Several manufacturing and commercial businesses are present to the south and southeast of the Site, including Jamestown Metal Products. To the west and southwest of the Site are United Alloys and Blackstone Advanced Technologies (sheet metal fabrication), respectively. Hope Windows Plants 1 and 3 are located to the west and northwest of the Site, respectively.

Historically, two distinct operations occurred at the Site (Figure 2-2). The northern portion of the Site (along Hopkins Avenue) was occupied by Hope's Windows (Hope Plant 5) and was used to manufacture steel and aluminum windows (McFarlene 1991). Following use by Hope's Windows, Essex Specialty Products, LLC operated the Site as a raw materials warehouse (NYSDEC 1990). The constituents of concern (COCs) associated with the northern portion of the Site have historically included polychlorinated biphenyls (PCBs) and currently include CVOCs. The northern portion of the Site is typically referred to as the Plant 5 Building and the former north parking lot sump (NPLS) area.

The Plant 5 Building was used to manufacture aluminum windows and window screens from approximately 1951 to 1985, when Essex Specialty Products purchased the Site (O'Brien & Gere 1992). Essex Specialty Products used the Plant 5 Building as a raw materials warehouse until Custom Production Manufacturing (CPM) purchased the Site in 2000. CPM used the Plant 5 Building for light manufacturing and metals fabrication between 2000 and 2021, when it was sold to UI (Jacobs 2022).

A trichloroethene (TCE) degreaser and a paint/primer tank were historically present in the southwestern corner of the Plant 5 Building, but were both removed in 1985 (NYSDEC 1992). The TCE and sludge in the degreaser pit are suspected to have been pumped out to the sump that was present in the NPLS area (Dow Chemical Company 1992). Accidental spills of TCE have also been reported in the NPLS area (Hallquist 1991). Numerous chemicals, including TCE, were in use by CPM in the Plant 5 Building until 2021 (URS Corporation 2015). UI currently occupies the Plant 5 Building on a part-time, irregular basis. Plant 5 and the surrounding area located between Blackstone and Hopkins Avenues constitute OU-01, which is the focus of this Site (Figure 2-2).

The southern portion of the Site (along Blackstone Avenue) was occupied by Jamestown Finishes, which produced coatings and finishes (NYSDEC 1994). The manufacturing processes resulted in impacts from petroleum-related compounds, including trimethylbenzenes and benzene, toluene, ethylbenzene and xylene, and, to a lesser extent, CVOCs (NYSDEC 1994). Previous operations and remedial actions within the southern portion of the Site generally do not indicate that CVOC impacts are significant, and as such, this FFS does not describe them in detail. An area of bis-2(ethyl)hexyl phthalate soil impacts in the eastern portion of the Site was excavated in the 1990s (O'Brien & Gere 1992).

2.2 Geology and Hydrogeology

Sections 2.2.1 and 2.2.2 provide a brief overview of geologic and hydrogeologic conditions, respectively.

2.2.1 Geology

The Site lies within the Chadakoin River valley. A surficial geology map for the Jamestown area indicates near-surface deposits consist of lacustrine sands at the Site, with mixed deposits mapped just south of the Site (Anderson et al. 1982). The mixed deposits are described as primarily glacial till, interspersed with sand and gravel and lacustrine silts and clays. A U.S. Geological Survey cross section about 2 miles down-valley indicates near-surface “lake sand” underlain by about 50 feet of lacustrine silt and clay and another 100 feet of lacustrine silt and sand (Anderson et al. 1982).

At the Site, the subsurface geological and hydrogeological features have been characterized into four units (O'Brien & Gere 1992), described as follows in descending order from grade:

- A shallow sand and gravel layer that generally ranges from 10 to 15 feet thick. Grain-size analysis indicates the unit contains on average 46% gravel, 39% sand, and 16% fines (predominantly silt) and was mostly classified as silty sands with gravel to gravel with silt and sand (Jacobs 2020). The unit is interpreted as alluvial outwash deposits. This unit is referred to as the shallow water-bearing zone (WBZ).
- A shallow silty clay layer is generally encountered around 15 feet below ground surface (bgs). The shallow silty clay deposits are generally 5 to 10 feet thick, but the thickness and depth can vary considerably and is absent or less than 2 feet thick in some areas, most notable near the NPLS source area. More permeable lenses of silt and fine sand are present in the silty clay in some locations. Grain-size analysis indicates that the unit is 99% fines, evenly divided between silt (53%) and clay (47%) (Jacobs 2020). Where present, the shallow silty clay serves as a leaky aquitard separating the shallow and deep aquifers.
- A deep sandy silt is generally encountered around 20 feet bgs and ranges from 13 to 31.5 feet thick. Based on grain-size analysis, this unit averages 78% silt, 12% sand, and 10% clay (Jacobs 2020). This unit is generally more clay-rich at shallow depths and siltier at depth. This unit is referred to as the deep WBZ.
- A deep silty clay has been determined to represent the lower confining layer. The deep silty clay typically is encountered between 37 and 47 feet bgs, and averages 92% fine-grained materials (roughly evenly divided between silt and clay), 6% sand, and 2% gravel (Jacobs 2020). One deep well at the Site encountered the deep silty clay to a depth of 95 feet bgs, with very fine to coarse sand encountered from 95 to 100 feet bgs (O'Brien & Gere 1992).

2.2.2 Hydrogeology

Two primary WBZs have been identified at the Site and are referred to as the shallow WBZ and the deep WBZ.

An unconfined aquifer is present in the shallow sand and gravel unit, herein referred to as the shallow WBZ, with saturated thicknesses generally 5 to 10 feet thick. Under nonpumping conditions, groundwater flow is to the east-northeast toward the Chadakoin River (CH2M 2015). Outside the capture zone of the pumping wells, groundwater flow is generally to the east-northeast, although groundwater flow to the north of Hopkins Avenue adjacent to the Site is to the southeast. The hydraulic conductivity in the shallow WBZ is 9.1 feet per day with an average groundwater velocity estimated to range from 89 to 177 feet per year (Dow Environmental 1995). Groundwater yield to the shallow WBZ recovery wells at the Site is meager because of the thin saturated interval (5 to 10 feet).

Groundwater is present under confined to semiconfined conditions in the deep sandy silt unit, herein referred to as the deep WBZ. Under nonpumping conditions, groundwater flow in the deep WBZ is to the northeast (CH2M 2015). In locations where the overlying shallow silty clay layer is thin or absent, it is likely there is a hydraulic connection between the shallow and deep WBZs. The average hydraulic conductivity in the deep WBZ is 1.6 feet per day and the average groundwater velocity is approximately 19 feet per year (Dow Environmental 1995). Groundwater yields to the deep WBZ recovery wells are meager because of the low hydraulic conductivity.

2.3 Overview of Site Contamination

Multiple Site investigations have been conducted since the 1990s to investigate Site environmental conditions. COC impacts present at OU-01 include the following:

- A CVOC groundwater plume in the shallow WBZ that extends from the NPLS area to the northeast roughly parallel to Hopkins Avenue (Figure 2-3). The primary COC in this plume is TCE, with concentrations ranging from more than 3,000 micrograms per liter (µg/L) on the north side of the Plant 5 Building to generally less than 100 µg/L in the offsite portion of the plume (Jacobs 2023a).
- Two groundwater plumes consisting of petroleum-related compounds in the shallow WBZ in the southern portion of the Site (Figure 2-3). One plume is primarily located underneath the West Building and consists primarily of xylenes and ethylbenzene. The second, lower concentration plume is in the eastern former underground storage tank (UST) area and consists primarily of 1,2,4- and 1,3,5-trimethylbenzene. The plumes are relatively stable and do not appear to be migrating significantly (Jacobs 2023a).
- There are residual low-level CVOC and petroleum-related compounds in the shallow WBZ in the former aboveground storage tank (AST)/UST area. The groundwater extraction in this area (RW-3S) was suspended in 2017 and residual concentrations are being allowed to naturally attenuate (Jacobs 2023a).
- A CVOC groundwater plume in the deep WBZ extends from the NPLS area to the northeast of the Site (Figure 2-4). Elevated concentrations of TCE, cis-1,2-DCE, and vinyl chloride are present, with concentrations greater than 100,000 µg/L in multiple wells. Nonaqueous phase liquid (NAPL), consisting of a waste oil containing TCE and cis-1,2-DCE, is present in a portion of the plume under the Plant 5 Building, as observed in monitoring wells PZ-4D and MW-118D (Jacobs 2022). Based on historical investigations, NAPL is not present at the bottom of the deep WBZ but does serve as a continuing source for persistently high groundwater concentrations (CH2M 2017, 2018; Jacobs 2019, 2023b).
- A 2022 groundwater sample collected from MW-7DD, which is completed in a deeper WBZ about 50 feet below the deep WBZ, had detected concentrations of TCE (350 µg/L) and cis-1,2-DCE (25 µg/L), orders of magnitude lower than the overlying deep WBZ (Jacobs 2023a). It is believed that migration is related to the MW-7DD well construction. This well will be sampled again and then abandoned before implementation of any new remedy for OU-01. Following remedy implementation, additional investigation of this deeper WBZ will be conducted to evaluate this potential deeper, lower-level contamination.
- CVOC soil impacts are primarily in the NPLS, under the Plant 5 Building, and extending to the northeast (Figure 2-5). Soil impacts are primarily in the saturated zone and at depths greater than 15 feet bgs and generally coincide with the CVOC groundwater plume in the deep WBZ (Jacobs 2023b).
- A vapor intrusion (VI) investigation was conducted in 2016 at the former Plant 5 Building and the adjacent West Building to determine if indoor or subsurface sources were contributing to elevated indoor air volatile organic compound (VOC) concentrations that another contractor observed in the former Plant 5 Building (URS 2015) and to assess the potential for VOCs linked to groundwater and soil at the Site to migrate into the building. The dataset suggested that although the presence of a complete VI pathway could not be ruled out, the previous indoor air concentrations of TCE were primarily controlled by TCE-containing products historically used and stored within the building.

Historical groundwater, soil, and air data are included as Tables 2-1a through 2-1f, Tables 2-2a through 2-2d, and Table 2-3, respectively.

3. Remedial Background

This section outlines remediation goals and RAOs as well as proposed updated remediation goals and standards, criteria, and guidance.

3.1 Remediation Goals and Remedial Action Objectives

The *Record of Decision Essex-Hope Site, City of Jamestown, Chautauqua County, ID Number 9-07-015* (hereinafter referred to as the 1994 ROD) lists the remediation goals and RAOs that currently apply to the Site (NYSDEC 1994). The remediation goals¹ specified in the 1994 ROD include the following:

- Eliminate the potential for direct human or animal contact with the contaminated soils onsite.
- Mitigate the impacts of contaminated groundwater to the environment.
- Mitigate, to the extent practicable, migration of contaminants from onsite source areas to groundwater.
- Provide for attainment of RAOs² (quantitative values) for groundwater and soil quality.

The RAO for groundwater for each CVOC (TCE, trans-1,2-dichloroethene, and vinyl chloride) is 5 µg/L. The RAOs also included petroleum compounds ethylbenzene, toluene, and xylene with RAOs of 5 µg/L and PCBs with an RAO of 0.1 µg/L. For those compounds without an RAO identified in the ROD, the New York Ambient Water Quality Criteria for groundwater is applicable. Table 3-1 summarizes the RAOs set in the ROD.

The RAOs for total VOCs in soil are 1 milligram per kilogram (mg/kg) for each individual compound and 10 mg/kg for the total VOC concentration. The RAOs for soil for each semivolatile organic compound (SVOC) is 50 mg/kg, with a total SVOC concentration RAO of 500 mg/kg. Total PCBs in soil are limited to 10 mg/kg.

3.2 Proposed Updated Remediation Goals and Standards, Criteria, and Guidance

The remediation goals presented in the 1994 ROD are still applicable to OU-01, with the exception that the first goal should be expanded to include potential exposure pathways associated with contaminated groundwater and an RAO addressing the VI pathway. Hence the revised RAOs include the following (with proposed additions in *italics*):

- Eliminate the potential for direct human or animal contact with contaminated soils onsite *and direct contact with or ingestion of contaminated groundwater onsite.*
- Mitigate the impacts of contaminated groundwater to the environment.
- Mitigate, to the extent practicable, migration of contaminants from onsite source areas to groundwater.
- Provide for attainment of *standards, criteria, and guidance (SCGs)* (quantitative values) for groundwater and soil quality.
- *Mitigate impacts to public health resulting from existing, or the potential for, soil VI into buildings within OU-01 at the Site.*

¹ The 1994 ROD used the term “remediation goals,” but they are analogous to NYSDCE’s definition of RAOs. For consistency with the 1994 ROD, this document retains the term “remediation goal” for medium-specific objectives for the protection of public health and the environment.

² The 1994 ROD used the term “RAOs” for quantitative cleanup goals, but the cleanup goals are analogous to NYSDCE’s media-specific standards, criteria, and guidance (SCGs). The term “RAO” is used when referring to the media-specific quantitative cleanup goals in the 1994 ROD, but the term “SCGs” is used to refer to the proposed media-specific quantitative cleanup goals.

Updates to the SCGs (termed RAOs in the 1994 ROD) are warranted to reflect current New York SCG since the ROD was signed in 1994..

For key COCs, Table 3-1 presents the following:

- The 1994 ROD RAOs
- Potentially applicable NYSDEC soil SCGs based on currently promulgated soil cleanup objectives (SCOs) (from Table 375-6.8[b] of 6 *New York Codes, Rules and Regulations* [NYCRR] Part 375, and guidance values provided in NYSDEC Policy CP-51 [NYSDEC 2010a]) for those COCs without promulgated SCOs
- Potentially applicable NYSDEC groundwater SCGs (criteria from 6 NYCRR Part 703.5 and guidance values from Division of Water Technical and Operational Guidance Series 1.1.1 [NYSDEC 1998])
- The proposed SCGs

The proposed soil SCGs are based on the promulgated protection of groundwater SCOs. These protection of groundwater SCOs are applicable to the COCs that are impacting groundwater. There are no ecological resources onsite; therefore, ecological receptor SCOs are not applicable according to 6 NYCRR 375-6.6. Ecological resources that may be present offsite will be addressed as part of future documents under OU-03.

As Section 3.3 describes, previous excavations have remediated soil impacts from bis(2-ethylhexyl)phthalate, di-n-butylphthalate, and PCBs. Therefore, it is recommended that these compounds be dropped as COCs. Confirmation sampling conducted in 1998 as part of the sump excavation in the NPLS indicated PCB concentrations at the excavation limits were less than the RAO of 10 mg/kg (URS 2008). As Table 2-2b indicates, 2017 soil sample concentrations for PCBs collected near the excavation were all less than 1 mg/kg, less than the RAO of 10 mg/kg (CH2M 2018). Phthalates present in soils in the eastern UST area were excavated as part of a 1992 Interim Remedial Measure (O'Brien & Gere 1992) and the 1994 ROD indicated that no further action was warranted.

Table 3-1 presents proposed updated groundwater SCGs for VOCs, which represent promulgated ambient water quality standards in NYCRR Part 703.5. Only COCs with recent exceedances of promulgated ambient water quality standards for groundwater are proposed to have SCGs.

3.3 Past and Ongoing Remediation Summary

Previous Site activities have resulted in impacts to soil and groundwater. and numerous remedial actions have been conducted at the Site since the early 1990s in response to the 1994 ROD. Ongoing remedial actions include operating a groundwater pump-and-treat system and maintaining an asphalt cap that restricts exposure to impacts in soil and limits leaching to groundwater. Institutional controls are also emplaced and are discussed further in Section 3.3.2.

3.3.1 Previous Remedial Actions

To date, the following remedial activities have been performed for OU-01:

- Onsite CVOCs in groundwater
 - Pump-and-treat (shallow and deep WBZs) (Radian Engineering 1998)
 - Soil vapor extraction (SVE) and air sparging (AS) (shallow WBZ) (Radian Engineering 1998)
 - Pilot test of zero valent iron injections (shallow and deep WBZs) (URS Corporation 2001, 2003)
 - In situ chemical oxidation (ISCO) injections (deep WBZ) (URS Corporation 2012)
- Petroleum-related compounds in shallow groundwater in the UST area and West Building
 - Pump-and-treat (UST area) (Radian Engineering 1998)
 - SVE and AS wells (UST area) (Radian Engineering 1998)
 - ISCO injections (UST area) (URS Corporation 2012)

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- Removal of USTs and excavation of soils (UST area) (URS 2003)
 - Vadose zone soil
 - SVE and AS wells (NPLS and AST areas) (Radian Engineering 1998)
 - Capping to prevent direct contact and minimize leaching of COCs to groundwater (NPLS and AST areas) (Radian Engineering 1998)
 - Excavation of soils within a portion of the NPLS area to remove soils with PCB concentrations higher than the RAOs stipulated in the 1994 ROD, as documented in a Basis of Design Report (Dow Environmental 1995) and Remedial Action Construction Close-out Report (Radian Engineering 1998)
 - An IRM consisting of soil excavation was completed in 1992 in response to a release of bis(2-ethylhexyl) phthalate, with all contaminated soil removed except a small area below a tank containment structure (O'Brien & Gere 1992). The 1994 ROD indicated no further action was warranted for this release.

3.3.2 Site Land Use Controls

Institutional controls consisting of a *Declaration of Covenants and Restrictions* were registered in February 2014 with the Chautauqua County Clerk (Essex 2014). The *Declaration of Covenants and Restrictions* applies to OU-01 and includes the following provisions:

- Prohibits the use of the property for any purpose other than industrial uses without a written waiver by NYSDEC.
- Prohibits the construction, use, or occupancy of the Site that results in disturbance or excavation that threatens the integrity of engineering controls or results in unacceptable human exposure to contaminated soils without written approval from NYSDEC.
- Prohibits disturbing, removing, or interfering with installation, use, operation, and maintenance of engineering controls required for the remedy without a written waiver from NYSDEC.
- Prohibits the use of groundwater under the Site without necessary water quality treatment for drinking water or industrial purposes.
- Requires the property owner to periodically certify that the institutional and engineering controls put in place are unchanged. Requires the property owner to continue in full force and effect any institutional controls required for the remedy and maintain such controls.
- Covenant will run with the land and be binding upon all future owners of the property.
- Any deed of conveyance for the property will recite that the conveyance is subject to the *Declaration of Covenants and Restrictions*.

4. Development of Remedial Alternatives

The following sections describe the development rationale of each of the four alternatives and their primary components for OU-01. All four alternatives have several common components as follows:

- Continued implementation of institutional controls at the Site (as described in Section 3.3.2).
- Continued implementation of engineering controls at the Site in the form of low-permeability asphalt and concrete covers in the NPLS, former UST, and former AST/UST areas.
- Implementation of natural attenuation (NA) with monitoring at OU-01.
 - In those areas not treated or contained by the primary OU-01 remedy
 - After the primary OU-01 remedy has been completed
- If it appears that the NA component will not address the contamination, additional active remediation will be required.

The remedial alternatives were developed with consideration of the requirements of NYCRR Part 375-1.8(d) regarding groundwater protection and control measures, including consideration of source removal or control, groundwater quality restoration, and plume containment and stabilization to the extent feasible (NYSDEC 2021).

4.1 Alternative 1 – Continuation of Existing Extraction and Treatment System

Alternative 1 is a baseline scenario that involves continued operations and maintenance (O&M) of the current remedial system within the design capacity and in compliance with the current ROD with the intent of restoring groundwater quality. NA with monitoring would be applied in those areas outside the current hydraulic capture zones within the OU-01 boundary. Once groundwater concentrations have been sufficiently reduced, the extraction and treatment system would be turned off, and NA with monitoring within the OU-01 boundary would be applied until SCGs are met. Additionally, existing institutional and engineering controls for OU-01 would continue.

The extraction and treatment system has operated at the Site since 1997, extracting groundwater from both the shallow WBZ and the deep WBZ. The goal of the system is to provide hydraulic capture in the shallow and deep WBZs to limit the offsite migration of contaminated groundwater; the system also removes dissolved contaminant mass from the subsurface. Figure 4-1 shows the locations of the existing recovery and monitoring wells. Presently two recovery wells, RW-1S and RW-2S, extract groundwater from the shallow WBZ in the NPLS area, and two recovery wells, RW-2D in the NPLS area and RW-6D at the northeast corner of the Plant 5 Building, extract groundwater from the deep WBZ. Total annual extraction volumes have decreased from about 2.5 million gallons in 1999 (4.8 gallons per minute [gpm] combined average rate from seven operating extraction wells) to 1.6 million gallons in 2021 (2.9 gpm average rate from four operating extraction wells). Although the total annual volume of water extracted has decreased by about 1/3, the total annual mass of VOCs removed has increased from 116 pounds in 1999 to 139 pounds in 2021 (Jacobs 2022). This increase in mass removal is primarily because of the addition of RW-6D to the system in 2008, which is extracting deep groundwater with high concentrations of CVOCs. The deep system (RW-2D and RW-6D and briefly RW-1D) has extracted 95% of the total mass removed from the Site groundwater, and 99.7% of the total mass removed since 2008 (Jacobs 2022). Groundwater monitoring indicates that the current extraction system exerts hydraulic control over the NPLS in the shallow WBZ and encompasses the entire Site in the deep WBZ, but that there are CVOCs in groundwater outside the capture zones in both the shallow and deep WBZs (Jacobs 2022). After nearly 25 years of pumping, high concentrations of CVOCs are present downgradient of the capture zone that call into question the overall effectiveness of the current extraction and treatment system. The residual CVOC and petroleum-related compounds present in the shallow WBZ in the former AST/UST area are generally within the shallow extraction well capture zone. The petroleum-related compound plume underneath the

West Building is generally within the shallow extraction well capture zone (Jacobs 2022). The petroleum-related compound plume in the former UST area is managed by NA with monitoring, with decreasing concentrations and a shrinking plume footprint (Jacobs 2022).

In the absence of other remedial actions, it is anticipated that the time required to transition to NA at OU-01 via operation of the current system would be more than 50 years. The extended operating time required to reach NA with monitoring at OU-01 is primarily due to the significant amount of contaminant mass estimated to remain in the onsite source area. The current system is designed to provide hydraulic control and containment of dissolved-phase contaminants but is not designed to maximize mass removal from the onsite source area. The observed mass removal rates indicate that the extraction and treatment system has not been effective at treating source areas, especially in the deep WBZ, because the typical asymptotic decline in mass removal has not been observed and residual NAPL remains. Given the presence of residual NAPL and significant sorbed mass present in the source area, removal of dissolved-phase contaminant mass has a minimal effect on total source area mass. Consequently, the time to sufficiently reduce source area mass and dissolved-phase concentrations to a level where the extraction and treatment system could be turned off and a transition to NA at OU-01 occurs is unlikely in the next 50 years.

4.2 Alternative 2 – Enhancement of Existing Extraction and Treatment System

Alternative 2 consists of upgrading the existing extraction and treatment system to include additional extraction wells within OU-01 to improve contaminant mass removal, hydraulic containment, and groundwater quality restoration when compared with the current extraction and treatment system. Once groundwater concentrations have been sufficiently reduced, the extraction and treatment system would be turned off and NA with monitoring would be applied at OU-01 until SCGs are met. Additionally, existing institutional and engineering controls for OU-01 would continue for Alternative 2. The addition of extraction wells, however, is unlikely to significantly decrease the amount of time required to transition to NA with monitoring at OU-01 compared to Alternative 1 because the source area mass would persist even with pumping. If Alternative 2 is selected as the remedy for the Site, a detailed design would be prepared to identify areas where additional extraction wells would yield greater mass removal and improve hydraulic capture. Figure 4-2 shows potential locations of new extraction wells, but these are provided for broad conceptual purposes and are not final. Existing underground utilities, conveyance piping construction requirements, and traffic or vehicular access would need to be considered when selecting locations for additional extraction wells. Given the low yield of the shallow and deep WBZs and the nature of the overburden geology, multiple wells would likely be required to meet the objectives of this alternative. Potential upgrades to the existing treatment system would also be evaluated during the design phase to ensure adequate treatment of the additional flow and contaminant mass before discharge.

As previously noted, although the expanded extraction well network will increase contaminant mass removal, the addition of extraction wells is unlikely to significantly reduce the amount of time required to transition OU-01 to NA with monitoring, as compared to the current extraction and treatment system, because dissolved-phase mass removal is ineffective at reducing source area contaminant mass and concentration. Furthermore, extraction and treatment systems will eventually reach an asymptotic mass removal rate. These factors hinder Alternative 2's ability to transition to NA with monitoring at OU-01 in a timely manner.

4.3 Alternative 3 – In Situ Thermal Treatment with Natural Attenuation with Monitoring

Alternative 3 consists of in situ thermal treatment (ISTT) within a specified target treatment zone (TTZ) that would be designed based on Jacobs' understanding of the nature and extent of onsite CVOC impacts and focused on source removal. NA with monitoring would be applied in those areas within OU-01 outside

the ISTT TTZ, including the petroleum-related compound plumes. NA with monitoring would be applied to all of OU-01 following ISTT until SCGs are met. Additionally, existing institutional and engineering controls for the Site would continue.

Figure 4-3 shows a proposed TTZ, but this is provided for broad conceptual purposes and is not final. ISTT will be applied to an approximately 24,000-cubic-yard volume (area of 21,600 square feet and vertical extent of approximately 10 to 40 feet bgs) that is estimated to contain approximately 4,900 pounds of total CVOCs. ISTT is an aggressive remedial approach that involves heating the subsurface with either thermal conduction heating or electrical resistance heating (ERH) to volatilize and extract CVOCs in both vapor and liquid phase. Heat is typically applied by electrical resistance, convection, conduction, or some combination of those heat transfer mechanisms. Volatilized CVOCs are usually extracted by soil vapor or multiphase extraction operated simultaneously with the application of heat, with ex situ treatment of the recovered CVOCs. During heating, the multiphase extraction provides hydraulic and pneumatic capture of the TTZ to reduce the likelihood of offsite migration. ISTT can achieve significant reductions in contaminant mass (greater than 90%), including areas of NAPL, in a relatively short construction duration and with little to no long-term O&M components. Short-term O&M requirements are substantial but of limited duration, lasting months instead of years, as would be required with an extraction and treatment system. Based on an evaluation of in situ thermal heating techniques, site conditions (geology, hydrogeology, and existing infrastructure), and costs, ERH is the best-suited technology for the project. This technique uses the natural resistance of subsurface materials to electrical current flow to generate heat. Electrodes are strategically inserted into the subsurface and when an alternating current is applied, the soil's resistance to the current generates heat. As the subsurface temperature rises, contaminants in the soil and groundwater are volatilized and desorbed from soil particles. These vapors are then captured using a vapor recovery system and treated at the surface.

If Alternative 3 is selected, a detailed design process would determine the optimal operating conditions to maximize removal of CVOC mass in the source zone. Alternative 3 would target and reduce CVOC mass in the source zone, which would decrease the amount of time needed to achieve SCGs for the onsite CVOC plumes. However, NA with monitoring of OU-01 applied in the petroleum-related compound plumes and concentrations, especially under the higher concentration West Building, could take a considerable time to reach SCGs. Following ISTT, groundwater monitoring would be performed at new wells installed within the OU-01 TTZ and at existing wells within the downgradient plume (OU-03). These wells would be sampled at a semiannual frequency for the first 2 years and then at an annual frequency for at least 3 additional years after thermal implementation. If it appears that the NA component will not address the contamination, additional active remediation will be required.

4.4 Alternative 4 – In Situ Thermal Treatment of the Onsite CVOC Area and In Situ Chemical Oxidation of the Petroleum Area

Alternative 4 consists of a combination of ISTT and ISCO and is focused on source removal. The ISTT remedy would be the same as that described for Alternative 3, targeting the onsite CVOC source area using ERH. ISCO is an in situ remediation technology that involves the injection of chemical oxidants into the subsurface, the most common of which are permanganate, persulfate, and hydrogen peroxide. ISCO would be implemented for petroleum-related compounds that are primarily present underneath the West Building and in the former UST area. ISCO is appropriate for the Site, as it has been successfully piloted in portions of the former UST areas to destroy petroleum-related compounds (URS 2012). NA with monitoring of OU-01 would be applied in those areas outside the ISTT and ISCO TTZs, such as the former AST/UST area. Following ISTT and ISCO treatment, NA with monitoring would be applied to OU-01 until RAOs are met. Groundwater monitoring will be performed at existing wells and new wells installed within OU-01 and at existing wells within the downgradient plume (OU-03). These wells will be sampled at a semiannual frequency for the first 2 years and then at an annual frequency for at least 3 additional years after thermal implementation. If it appears that the NA component will not address the contamination, additional active remediation will be required. Additionally, existing institutional controls for the Site would continue.

Figure 4-4 shows a proposed TTZ for ISTT and proposed locations for ISCO injections, but these are provided for broad conceptual purposes and are not final. It is estimated that ISTT will be applied to an approximately 24,00-cubic-yard volume (area of 21,600 square feet and vertical extent of approximately 10 to 40 feet bgs) that is estimated to contain approximately 4,900 pounds of total CVOCs. A detailed design process would determine the optimal operating conditions to maximize removal of CVOC mass in the source zone by ISTT. The TTZ for ISCO injections is estimated to be about 5,000 square feet (vertical saturated interval of 9 to 16 feet bgs) to the east, and 6,500 square feet (vertical saturated interval of 8 to 14 feet bgs) to the west. If Alternative 4 is selected, a detailed design process would commence for both ISTT (as previously described for Alternative 3) and ISCO. The ISCO design would focus on refining the TTZ; selecting the most appropriate oxidant, dosing, and activation agent (if needed); and identifying appropriate locations and approach for injections. Alternative 4 would result in the shortest time frame to achieve RAOs because it would use both ISTT and ISCO to treat the onsite contaminant mass of CVOCs and petroleum-related compounds, respectively.

5. Analysis of Remedial Alternatives

The analysis of alternatives presents the relevant information needed to compare the remedial alternatives assembled for achieving remediation goals for CVOC and petroleum impacts within the OU-01 boundary.

The alternatives were subjected to an evaluation against the nine evaluation criteria listed in 6 NYCRR Part 375-1.8(f) and described in NYSDEC's Division of Environmental Remediation (DER) guidance DER-10, *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010b). The first two criteria, overall protectiveness of public health and the environment and conformance with SCGs, are threshold criteria that must be met, and the next six evaluation criteria are primary balancing criteria that are used to compare the positive and negative aspects of each remedial alternative. The final criterion, community acceptance, is a modifying criterion that will be detailed in a ROD Amendment after a 45-day public comment period. Table 5-1 of this FFS qualitatively evaluates the cost-effectiveness criterion discussed herein; however, a detailed cost estimate of the selected alternative will be prepared during the design phase.

Table 5-1 presents detailed evaluations against each of the nine criteria for the four alternatives in Section 4. The comparative evaluation that the following subsections present highlights the most important factors distinguishing the alternatives. As Section 5.1 and Table 5-1 discuss, Alternative 1 did not pass the threshold criteria and therefore is not included in the comparative evaluation.

5.1 Overall Protectiveness of Public Health and the Environment

There is currently no exposure to CVOC and petroleum impacts associated with the Site. For all alternatives, the existing institutional controls in the 2014 Declaration of Covenant controls potential onsite exposure pathways by prohibiting disturbances of asphalt/concrete caps, soil excavation, or use of groundwater without treatment, thereby preventing direct contact with soils and groundwater and ingestion of groundwater. Plans and controls will be in place to control potential exposure pathways during any remedial action activities and ensure that the cap is repaired following remedial action activities.

The capture zones created by operation of the current system do not fully contain the CVOC plumes, and CVOCs have migrated to OU-03 outside of the capture zones. Therefore, Alternative 1 does not meet the threshold criteria of overall protectiveness of public health and the environment and therefore is not considered in the remainder of the comparative evaluation. Alternative 2 would maintain protectiveness of public health and the environment through improved control (via hydraulic containment) and removal (through treatment of dissolved-phase groundwater extracted) of the CVOC plumes until concentrations decline sufficiently to naturally attenuate and eventually meet SCGs. Alternative 2 would provide sufficient overall protectiveness of public health and the environment within the OU-01 boundary because it would have additional extraction wells to improve contaminant mass removal and hydraulic containment when compared with the current extraction and treatment system. Alternative 3 would maintain protectiveness of public health and the environment through ISTT to remove and treat the CVOC source area, which will result in significant declines in source area mass and groundwater concentrations. Alternative 4 also includes destruction of petroleum-related compounds by oxidation under the West Building, whereas the other alternatives rely on NA with monitoring within the OU-01 boundary.

For all three retained alternatives, areas within the OU-01 boundary but outside the effective treatment or containment zones would continue to be addressed by NA with monitoring, and existing institutional and engineering controls restricting potential receptor exposures would remain in effect until SCGs are met, thereby maintaining protectiveness. Each of the three retained alternatives may eventually achieve or approach the SCGs; however, the time to meet SCGs is expected to be longer for Alternative 2, shorter for Alternative 3, and the shortest for Alternative 4.

5.2 Compliance with Standards, Criteria, and Guidance

As Section 3.2 discussed, SCGs are proposed to be updated to comply with SCGs promulgated or updated after the 1994 ROD. However, the existing extraction and treatment system does not fully achieve the remediation goal to mitigate the impacts of contaminated groundwater to the environment. Additionally, attainment of SCGs for soil and groundwater will require an extended period (at least 50 years).

Alternatives 2 and 3 are expected to achieve the remediation goals and meet or approach RAOs.

Alternative 3 is expected to achieve or approach SCGs within a shorter time frame than Alternative 2 due to the CVOC source removal. Alternative 4 is expected to achieve or approach RAOs within the shortest time frame because of the additional ISCO treatment for petroleum source areas.

5.3 Long-term Effectiveness and Permanence

Alternative 2 has lower permanence than Alternatives 3 and 4 because when the groundwater extraction and treatment system is turned off (including unplanned outages), hydraulic control of the contaminant plume is lost. The petroleum source areas, like the CVOC source areas, would be within the expanded system capture zone; however, reductions in concentrations are expected to be slow.

Alternative 3 has better long-term effectiveness and permanence than Alternative 2. ISTT is expected to significantly and permanently reduce source area CVOC contaminant mass. Remaining CVOC mass postimplementation is expected to naturally attenuate, and there are no expected impacts on human or ecological receptors because of the institutional controls and reduced contaminant mass. This remedy does not address the petroleum area impacts; however, NA is expected to eventually result in reduction of contaminant mass and concentrations.

Alternative 4 has the best long-term effectiveness and permanence. ISTT is expected to significantly (relative to Alternatives 2 and 3) and permanently reduce CVOC source area contaminant mass. In addition, ISCO is expected to permanently reduce petroleum impacts in the West Building area. Remaining mass postimplementation is expected to naturally attenuate, and there are no anticipated exposures to human or ecological receptors because of the institutional controls and reduced contaminant mass.

For all alternatives, long-term effectiveness of NA with monitoring within the OU-01 boundary is dependent on demonstrating that attenuation processes within OU-01 are resulting in declining or stable contaminant concentrations. Given the more aggressive source treatments associated with Alternatives 3 and 4, these remedies are expected to be more effective than Alternative 2, with Alternative 4 being the most effective.

5.4 Reduction in Toxicity, Mobility, or Volume through Treatment

According to 6 NYRR Part 375, technologies that destroy or treat contaminants are preferred over technologies that stabilize, control, or isolate contaminants. Based on this criteria, Alternative 3 is preferred over Alternative 2. Alternative 3 will employ a technology (ISTT) that significantly reduces the toxicity and volume of contaminants by mobilizing contaminants in the CVOC source zone, which are then collected and destroyed by ex situ treatment, but Alternative 4 provides the most reduction in toxicity and volume of contamination because it also will result in permanent destruction of contaminants via oxidant injections that target petroleum-related compounds in the West Building area. Alternative 2 relies primarily on control and isolation of contaminant mass by maintaining a capture zone to reduce contaminant mobility, with minor reduction of toxicity by removing and treating dissolved-phase mass from the subsurface. However, extraction and treatment remedies will ultimately reach an asymptotic removal rate, and the rate of removal is anticipated to significantly decrease over time.

5.5 Short-term Impacts and Effectiveness

Alternative 2 would have some short-term impacts because workers could be exposed to contaminants during installation of additional extraction wells and conveyance piping, and during O&M of the groundwater treatment plant. Alternative 3 would have more short-term impacts than Alternative 2 because they would require mobilization, installation, operation, and demobilization of equipment required for ISTT. There also would be more traffic during ISTT activities, although the duration for Alternative 3 would be shorter than for Alternative 2 because the period of implementation would be on the order of months rather than decades. During the period of ISTT system construction, the existing extraction system will need to be shut down, potentially resulting in downgradient migration of COCs during this brief period. During heating, multiphase extraction will result in hydraulic and pneumatic capture of the TTZ. Alternative 4 would have additional short-term impacts compared with Alternative 3 associated with storage, handling, and deployment of chemical oxidants, including potential daylighting of injected oxidants or accidental spills of the oxidant. The potential exists that ISCO treatment would require multiple rounds of injections (on the order of two to three injections over 2 to 4 years). However, for all alternatives, most short-term impacts (except for increased traffic) can be mitigated by implementing appropriate engineering, monitoring, and administrative controls.

5.6 Implementability

Although all retained alternatives are likely implementable, Alternative 2 is the most implementable, Alternative 3 is more difficult to implement, and Alternative 4 is the most difficult to implement. Alternative 2 has been proven to be implementable because the extraction and treatment system has already been installed and operating, but the alternative would require installation of additional extraction wells, conveyance piping, and potentially upgrades to the existing treatment system. Although Alternative 3 is implementable, there are more challenges than with Alternative 2 given the need to install thermal remediation equipment within a building, achieve sufficient electrical supply and equipment for power demands, and additional permitting requirements. Alternative 4 has the most implementability challenges, given that it has the same implementability challenges as Alternative 3 for the ISTT system, and the injection of oxidants within the West Building would require building access and underground injection control permitting associated with placing injection points or wells. However, these implementability challenges are manageable and can be surmounted during the design process.

5.7 Cost-effectiveness

Table 5-1 provides a qualitative cost comparison of the alternatives. More detailed costs will be developed after remedy selection. Qualitative capital costs for the retained alternatives are ranked from the lowest cost for Alternative 2, middle cost for Alternative 3, and highest cost for Alternative 4. However, long-term operating costs are ranked from the lowest cost for Alternative 4, middle cost for Alternative 3, and highest cost for Alternative 2 (because of the need to operate expanded extraction and treatment system for at least 50 years). These capital and O&M costs result in similar overall costs for the alternatives. Because of the more aggressive treatment, Alternative 4 will be more effective than Alternatives 2 and 3. Cost-effectiveness for Alternative 3 is slightly lower than for Alternative 4 because this alternative will be slightly less effective (because the petroleum source areas will be managed by NA with monitoring).

5.8 Land Use

Land use is primarily light industrial in the area and it is expected that the Site will remain a light industrial property. Institutional controls will remain in place after remedy implementation. No change is expected in any environmental covenants or easements, which include stipulations that the Site use remain industrial.

5.9 Community Acceptance

Community acceptance will be considered after public comments are received on an ROD Amendment.

6. Summary

The results of the evaluation of alternatives Section 5 described indicates that Alternative 4 (ISTT of the CVOC source area, ISCO of the petroleum source area, followed by NA with monitoring, and institutional and engineering controls) is the preferred alternative. ISTT/ISCO will target mass removal in the CVOC and petroleum plumes and will reduce source zone mass in a shorter time frame when compared with the other alternatives. Alternative 4 provides the most efficient means of remediating the volume of contaminant mass within both the CVOC and petroleum source areas with low impact to workers and the surrounding community. Although capital costs will be high for Alternative 4, long-term O&M costs are expected to be lower than for the other alternatives, and Alternative 4 should accelerate the time until a passive technology such as NA with monitoring can be implemented at OU-01.

The existing institutional and engineering controls Section 3.3 described would remain in place upon implementation of the selected remedy to allow for continued protection of human health from Site-related contaminants.

With Alternative 4, the remediation time for the CVOC and petroleum source areas is anticipated to be in terms of years (instead of greater than 50 years for the current remedy).

As Section 4 discussed, a detailed design will be completed upon finalization and public comment on an ROD Amendment that is expected to identify Alternative 4 as the Remedial Action. The results of the detailed design, including anticipated costs for implementation, will be prepared and documented in a Basis of Design report that will be submitted to NYSDEC for review and approval. It is anticipated that NYSDEC and Essex will agree to a revised Consent Order in parallel with the ROD Amendment and design.

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Tables



Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-007	DPT-007	DPT-008	DPT-008	DPT-009	DPT-009	DPT-010	DPT-010	DPT-011	DPT-011	DPT-011	DPT-012	DPT-012	DPT-012	DPT-013	DPT-013
Sample Depth (feet bgs)	20-24	30-34	24-28	36-40	22-26	30-34	20-24	32-36	11-15	22-26	32-36	11-15	26-30	36-40	11-15	24-28
Sample Date	9/21/2016	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/20/2016	9/15/2017	9/15/2017	9/14/2017	9/14/2017	9/15/2017	9/13/2017	9/15/2017	9/15/2017	9/11/2017	9/11/2017
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Deep
Onsite/Offsite	OU-01	OU-01	OU-03	OU-03	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																
1,1,1,2-Tetrachloroethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	1000 U	250 U	2500 U	100 U	200 U	250 U	20 UJ	2.0 UJ	0.50 UJ	0.50 UJ	50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	3000 U	750 U	7500 U	300 U	600 U	750 U	60 U	6.0 U	1.5 U	1.5 U	150 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	1000 U	250 U	2500 U	100 U	330	250 U	17 J	8.1	0.50 U	0.50 U	68	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	5000 UJ	1200 UJ	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	4000 U	1000 U	10000 U	400 U	800 U	1000 U	80 U	8.0 U	2.0 U	2.0 U	200 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethene, cis-	58000	15000	460000	7300	52000	17000	5700	660	11	3.6 U	15000	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, Total	58000	15000	460000	7300	52000	17000	6000	670	11	3.6 U	15000	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, trans-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	310	14	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	2000 U	500 U	5000 U	200 U	400 U	500 U	40 U	4.0 U	1.0 U	1.0 U	100 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropene, cis-	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	--	--	1200000 U	50000 U	100000 U	120000 U	10000 U	1000 U	250 U	250 U	25000 U	250 U	250 U	250 U	250 U	250 U
2,2-Dichloropropane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 UJ	20 UJ	5.0 UJ	5.0 UJ	500 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
4-Chlorotoluene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Acetone	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 UJ	15 J	4.9 J	2.9 J	500 UJ	1.9 J	5.7 J	13 J	24 J	3.8 J
Benzene	1000 U	250 U	2500 U	100 U	120 J	250 U	20 U	5.5	0.50 U	0.50 U	61	0.50 U	0.50 U	0.50 U	0.22 J	0.50 U
Bromobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	4000 U	1000 U	10000 U	400 U	800 U	1000 U	80 U	8.0 U	2.0 U	2.0 U	200 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Bromomethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	--	--	--	--	--	--	--	--	--	--
Butylbenzene, n-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 U	20 U	5.0 U	5.0 U	500 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-007	DPT-007	DPT-008	DPT-008	DPT-009	DPT-009	DPT-010	DPT-010	DPT-011	DPT-011	DPT-011	DPT-012	DPT-012	DPT-012	DPT-013	DPT-013
Sample Depth (feet bgs)	20-24	30-34	24-28	36-40	22-26	30-34	20-24	32-36	11-15	22-26	32-36	11-15	26-30	36-40	11-15	24-28
Sample Date	9/21/2016	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/20/2016	9/15/2017	9/15/2017	9/14/2017	9/14/2017	9/15/2017	9/13/2017	9/15/2017	9/15/2017	9/11/2017	9/11/2017
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Deep
Onsite/Offsite	OU-01	OU-01	OU-03	OU-03	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																
Carbon Tetrachloride	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 UJ	10 UJ	2.5 UJ	2.5 UJ	250 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Chloroethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 UJ	10 UJ	2.5 UJ	2.5 UJ	250 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Chloroform	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	5000 UJ	1200 UJ	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ
Dibromochloromethane	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 UJ	20 UJ	5.0 UJ	5.0 UJ	500 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Dichlorodifluoromethane	10000 UJ	2500 UJ	25000 U	1000 U	2000 U	2500 U	200 UJ	20 UJ	5.0 UJ	5.0 UJ	500 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Ethylbenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 UJ	20 UJ	5.0 UJ	5.0 UJ	500 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 U	20 U	5.0 U	5.0 U	500 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5.0 UJ
Methyl tert-butyl Ether	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
n-Propylbenzene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	1000 U	250 U	2500 U	100 U	200 U	250 U	20 U	2.0 U	0.50 U	0.50 U	50 U	0.89	0.50 U	0.50 U	0.52	0.50 U
Toluene	5000 U	1200 U	12000 U	500 U	430 J	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.1 J	2.5 U
Trichloroethene	100000	10000	62000	1700	71000	30000	900 J	12 J	21 J	14 J	15000 J	6.0 J	0.50 UJ	0.50 UJ	1.1 J	0.50 UJ
Trichlorofluoromethane	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	10000 U	2500 U	25000 U	1000 U	2000 U	2500 U	200 UJ	20 UJ	5.0 UJ	5.0 UJ	500 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Vinyl Chloride	1000 J	230 J	4800 J	18 J	2900	450 J	89	39	1.0 U	1.0 U	450	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene, m- & p-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylene, o-	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	5000 U	1200 U	12000 U	500 U	1000 U	1200 U	100 U	10 U	2.5 U	2.5 U	250 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CBTEX	5000 U	1200 U	12000 U	500 U	550 J	1200 U	100 U	5.5	2.5 U	2.5 U	61	2.5 U	2.5 U	2.5 U	2.32 J	2.5 U
Total CVOC	160000 J	25000 J	530000 J	9000 J	130000	47000 J	7016 J	733.1 J	32 J	14 J	30518 J	6.89 J	5 UJ	5 UJ	1.62 J	5 UJ
Total VOC	217000	40230	986800	16318	178780	64450	7016 J	753.6 J	36.9 J	16.9 J	30579 J	8.79 J	5.7 J	13 J	27.94 J	3.8 J

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-013	DPT-014	DPT-014	DPT-015	DPT-015	DPT-015	DPT-016	DPT-016	DPT-016	DPT-017	DPT-017	DPT-018	DPT-018	DPT-019	DPT-020	DPT-021	DPT-022	DPT-051
Sample Depth (feet bgs)	36-40	24-28	36-40	24-28	24-28	34-38	24-28	24-28	34-38	23-27	33-37	28-32	37-41	24-28	10-15	10-15	10-15	12-14
Sample Date	9/11/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/5/2017	9/7/2017	9/6/2017	9/7/2017	9/7/2017	9/8/2017	9/8/2017	9/19/2017	9/19/2017	9/19/2017	9/19/2017	9/11/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-03	OU-01
Sample Type	N	N	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,1,2,2-Tetrachloroethane	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	1.2 UJ	0.50 UJ	0.50 UJ	25 UJ	0.50 UJ	2.5 UJ	20 U
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3.8 U	1.5 U	1.5 U	75 U	1.5 U	7.5 U	60 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,1-Dichloroethene	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	3400	170	12 U	240
1,2-Dibromo-3-Chloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	2.0 U	2.0 U	100 U	2.0 U	10 U	80 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	0.70 J	7.4 J	18	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	0.70 J	7.4 J	19 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.78 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	50 U	1.0 U	5.0 U	40 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	59 J
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,3-Dichloropropene, cis-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
1,3-Dichloropropene, Total	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
1,3-Dichloropropene, trans-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	620 U	250 U	250 U	12000 U	250 U	1200 U	10000 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
2-Hexanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	1.9 J	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	5.0 UJ	250 UJ	5.0 UJ	25 UJ	200 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Acetone	3.3 J	3.0 J	2.5 J	5.0 UJ	2.0 J	6.2 J	5.2 J	110 J	5.0 UJ	7.4 J	51 J	16 J	1.7 J	3.6 J	250 UJ	3.6 J	11 J	200 U
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
Bromoform	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.0 U	2.0 U	2.0 U	100 U	2.0 U	10 U	80 U
Bromomethane	--	--	--	--	--	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	6.2 UJ	2.5 UJ	2.5 UJ	120 UJ	2.5 UJ	12 UJ	100 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	52 J	1.0 J	5.1 J	100 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	4.1	12 U	100 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	1.2 J	12 U	100 U
Carbon Disulfide	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	12 U	5.0 U	5.0 U	250 U	5.0 U	25 U	200 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-013	DPT-014	DPT-014	DPT-015	DPT-015	DPT-015	DPT-016	DPT-016	DPT-016	DPT-017	DPT-017	DPT-017	DPT-018	DPT-018	DPT-019	DPT-020	DPT-021	DPT-022	DPT-051
Sample Depth (feet bgs)	36-40	24-28	36-40	24-28	24-28	34-38	24-28	24-28	34-38	23-27	33-37	33-37	28-32	37-41	24-28	10-15	10-15	10-15	12-14
Sample Date	9/11/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/12/2017	9/5/2017	9/7/2017	9/6/2017	9/7/2017	9/7/2017	9/7/2017	9/8/2017	9/8/2017	9/19/2017	9/19/2017	9/19/2017	9/19/2017	9/11/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-03	OU-01
Sample Type	N	N	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
Analyte																			
Carbon Tetrachloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Chlorobromomethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	6.2 UJ	2.5 UJ	2.5 UJ	120 UJ	2.5 UJ	12 UJ	100 U
Chloroethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	6.2 UJ	2.5 UJ	2.5 U	120 U	2.5 U	12 U	100 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Chloromethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	2.5 U	20 U
Dibromomethane (Methylene Bromide)	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	5.0 UJ	250 UJ	5.0 UJ	25 UJ	200 U
Dichlorodifluoromethane	5.0 UJ	--	--	--	--	--	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	5.0 UJ	250 UJ	5.0 UJ	25 UJ	200 U
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	610	7.4	12 U	4100
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	130	28	25	130
Methyl Ethyl Ketone (2-Butanone)	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	3.2 J	31 J	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	4.8 J	250 UJ	6.0 J	25 UJ	200 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	5.0 UJ	250 UJ	5.0 UJ	25 UJ	200 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Naphthalene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	790	22	22	170
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	480	71	13	76 J
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	37 J	1.5 J	12 U	100 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Tetrachloroethene	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.2 U	0.50 U	0.50 U	25 U	0.50 U	0.90 J	20 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	30 J
Trichloroethene	0.50 UJ	0.50 U	0.50 U	0.50 UJ	3.0 J	8.9	0.50 UJ	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ	1.2 UJ	0.50 UJ	0.54	25 U	0.50 U	2.5 U	20 U
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	2.5 U	12 U	100 U
Vinyl Acetate	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	12 UJ	5.0 UJ	5.0 UJ	250 UJ	5.0 UJ	25 UJ	200 U
Vinyl Chloride	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	0.09 J	0.14 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	0.08 J	50 U	1.0 U	5.0 U	40 U
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	43 J	2.5 U	12 U	13000
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	120 U	1.0 J	12 U	910
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	43 J	1.0 J	12 U	14000
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	783 J	36.4 J	25	18000 J
Total CVOC	5 UJ	2.5 UJ	2.5 UJ	0.7 J	10.49 J	27.82 J	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	12 UJ	5 UJ	0.62 J	250 UJ	5 UJ	0.9 J	200 U
Total VOC	3.3 J	3 J	2.5 J	0.7 J	15.69 J	66.92 J	5.2 J	110 J	250 UJ	7.4 J	51 J	16 J	1.7 J	9.02 J	5542 J	316.8 J	77 J	19000 J	

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-052	DPT-053	DPT-054	DPT-055	DPT-055	DPT-057	DPT-058	DPT-059	DPT-060	DPT-060	DPT-061	DPT-062	DPT-063	DPT-064	DPT-065	DPT-084	DPT-084	
Sample Depth (feet bgs)	12-14	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	29	29	
Sample Date	9/11/2019	9/11/2019	9/16/2019	9/16/2019	9/16/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/13/2019	9/11/2019	9/11/2019	9/11/2019	10/19/2022	10/19/2022
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	
Onsite/Offsite	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	
Sample Type	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N	N	N	FD
Analyte																		
1,1,1,2-Tetrachloroethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,1,1-Trichloroethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,1,2,2-Tetrachloroethane	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
1,1,2-Trichloroethane	1.5 U	3.0 U	3.0 U	1.5 U	1.5 U	30 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	6.0 U	30 U	3.8 U	1500 U	1500 U
1,1-Dichloroethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,1-Dichloroethene	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	470 J	470 J
1,1-Dichloropropene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2,3-Trichlorobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2,3-Trichloropropane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2,4-Trichlorobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2,4-Trimethylbenzene	2.5 U	6.7	330	2.5 U	2.5 U	1600	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	64	72	45 J	5.8 J	2500 U	2500 U
1,2-Dibromo-3-Chloropropane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	4.0 U	4.0 U	2.0 U	2.0 U	40 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8.0 U	40 U	5.0 U	2000 U	2000 U
1,2-Dichlorobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2-Dichloroethane	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
1,2-Dichloroethene, cis-	0.73 J	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	70000	69000
1,2-Dichloroethene, Total	0.73 J	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	70000	69000
1,2-Dichloroethene, trans-	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,2-Dichloropropane	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0 U	20 U	2.5 U	1000 U	1000 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.8 J	15 J	6.2 U	2500 U	2500 U
1,3-Dichlorobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,3-Dichloropropane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,3-Dichloropropene, cis-	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
1,3-Dichloropropene, Total	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
1,3-Dichloropropene, trans-	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
1,4-Dichlorobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
1,4-Dioxane (p-Dioxane)	250 U	500 U	500 U	250 U	250 U	5000 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	1000 U	5000 U	620 U	250000 U	250000 U
2,2-Dichloropropane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
2-Chlorotoluene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
2-Hexanone	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
4-Chlorotoluene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Acetone	10 U	14 U	10 U	5.0 U	5.0 U	100 U	5.3 U	14 U	6.4 U	6.6 U	7.3 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U	
Benzene	2.4	12	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.22 J	0.78 J	10 U	3.1	500 U	500 U	
Bromobenzene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Bromodichloromethane	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
Bromoform	2.0 U	4.0 U	4.0 U	2.0 U	2.0 U	40 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8.0 U	40 U	5.0 U	2000 U	2000 U
Bromomethane	2.5 UJ	5.0 UJ	5.0 UJ	2.5 UJ	2.5 UJ	50 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	10 UJ	50 UJ	6.2 UJ	2500 U	2500 U
Butylbenzene, n-	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	18 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.4	10 U	50 U	6.2 U	2500 U	2500 U
Butylbenzene, sec-	2.5 U	6.4	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.8	10 U	50 U	2.9 J	2500 U	2500 U
Butylbenzene, t-	2.5 U	1.4 J	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Carbon Disulfide	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-052	DPT-053	DPT-054	DPT-055	DPT-055	DPT-057	DPT-058	DPT-059	DPT-060	DPT-060	DPT-061	DPT-062	DPT-063	DPT-064	DPT-065	DPT-084	DPT-084
Sample Depth (feet bgs)	12-14	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	10-12	29	29
Sample Date	9/11/2019	9/11/2019	9/16/2019	9/16/2019	9/16/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/12/2019	9/13/2019	9/11/2019	9/11/2019	10/19/2022	10/19/2022
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep
Onsite/Offsite	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03
Sample Type	N	N	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	FD
Analyte																	
Carbon Tetrachloride	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
Chlorobenzene	2.5 U	1.8 J	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Chlorobromomethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Chloroethane	2.5 U	5.0 U	5.0 UJ	2.5 UJ	2.5 UJ	50 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	10 UJ	50 UJ	6.2 U	2500 U	2500 U
Chloroform	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Chloromethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Dibromochloromethane	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
Dibromomethane (Methylene Bromide)	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
Dichlorodifluoromethane	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
Ethylbenzene	2.4 J	180	5.0 U	2.5 U	2.5 U	55	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	140	110	960	75	2500 U
Hexachlorobutadiene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Isopropylbenzene (Cumene)	2.5 U	41	6.9	2.5 U	2.5 U	250	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	31	90	72	15	2500 U
Methyl Ethyl Ketone (2-Butanone)	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
Methyl tert-butyl Ether	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Methylene Chloride	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Naphthalene	2.5 U	4.9 J	10	2.5 U	2.5 U	380	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	35	4.5 J	18 J	6.5	2500 U
n-Propylbenzene	2.5 U	11	30	2.5 U	2.5 U	570	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	30	40	31 J	2.1 J	2500 U
p-Isopropyltoluene	2.5 U	7.5	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Styrene	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Tetrachloroethene	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	10 U	1.2 U	500 U	500 U
Toluene	2.5 U	20	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	430	2500 U	2500 U
Trichloroethene	0.50 U	1.0 U	0.45 J	0.35 J	0.32 J	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.49 J	2.0 U	10 U	0.45 J	320000	350000
Trichlorofluoromethane	2.5 U	5.0 U	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	50 U	6.2 U	2500 U	2500 U
Vinyl Acetate	5.0 U	10 U	10 U	5.0 U	5.0 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	20 U	100 U	12 U	5000 U	5000 U
Vinyl Chloride	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.09 J	4.0 U	20 U	2.5 U	1700	1700
Xylene, m- & p-	6.6	470	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	110	740	5400	350	2500 U
Xylene, o-	2.5 U	86	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.1	23	210	93	2500 U
Xylenes, Total	6.6	560	5.0 U	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	120	760	5600	440	2500 U
Total CBTEX	11 J	810	6.9	2.5 U	2.5 U	310	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	290 J	960 J	6600	970	2500 U
Total CVOC	0.73 J	1.8 J	0.45 J	0.35 J	0.32 J	100 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	0.58 J	20 UJ	100 UJ	0.45 J	392170
Total VOC	12 J	850 J	380 J	0.35 J	0.32 J	2900 J	250 UJ	250 UJ	250 UJ	250 UJ	250 UJ	250 UJ	420 J	1100 J	6800 J	980 J	421170

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-085	GP-1S	HW-6	HW-6	HW-6	HW-8	HW-10	HW-10	MW-1	MW-7D	MW-7D	MW-11D	MW-11D	MW-12	MW-12	MW-13	MW-13
Sample Depth (feet bgs)	32-35	8-13	6-16	6-16	6-16	6-16	7-17	7-17	15-20	35-45	35-45	35-45	35-45	4-14	4-14	8-18	8-18
Sample Date	10/19/2022	10/19/2017	11/3/2016	3/16/2017	10/19/2017	3/16/2017	11/3/2016	10/17/2017	11/4/2016	11/4/2016	11/4/2016	11/4/2016	10/18/2017	11/3/2016	10/18/2017	10/17/2017	3/20/2018
Shallow or Deep WBZ	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	Split	N	N	N	N	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	200 U	0.50 U	1.0 U	1.2 U	0.50 UJ	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	600 U	1.5 UJ	1.0 U	3.8 UJ	1.5 UJ	1.5 UJ	1.0 U	1.5 UJ	1.5 U	750 U	100 U	1.0 U	1.5 UJ	1.0 U	1.5 UJ	1.5 UJ	1.5 U
1,1-Dichloroethane	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	600	0.50 U	0.83 J	1.2 U	0.34 J	0.50 U	1.0 U	0.50 U	0.5 U	160 J	150	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	1200 U	--	--	2.5 UJ	--	2.5 UJ	2.5 UJ	2.5 UJ
1,2-Dibromoethane (Ethylene Dibromide)	800 U	2.0 U	--	5.0 U	2.0 U	2.0 U	--	2.0 U	2 U	1000 U	--	--	2.0 U	--	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 UJ	1.0 U	0.50 UJ	0.50 U	0.50 U
1,2-Dichloroethene, cis-	78000	16	440	200	180	2.5 U	1.0 U	2.5 U	2.5 U	46000	48000	0.51 J	2.5 U	13	37	5.5	0.99 J
1,2-Dichloroethene, Total	78320 J	16	--	200	180 J	2.5 U	--	2.5 U	2.5 U	46000	48000	--	2.5 U	--	37	5.5	0.99 J
1,2-Dichloroethene, trans-	320 J	2.5 U	3.8	6.2 U	2.1 J	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	150	1.0 U	2.5 U	0.19 J	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	400 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	500 U	100 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	1000 U	2.5 U	5.0 U	6.2 U	2.5 U	2.5 U	5.0 U	2.5 U	2.5 U	1200 U	100 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	1200 U	--	--	2.5 UJ	--	2.5 UJ	2.5 UJ	2.5 U
1,3-Dichloropropene, cis-	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	200 U	0.50 U	--	1.2 U	0.50 U	0.50 U	--	0.50 U	0.5 U	250 U	--	--	0.50 U	--	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	100000 U	250 U	--	620 U	250 U	250 U	--	250 U	250 UJ	120000 UJ	--	--	250 U	--	250 U	250 U	250 UJ
2,2-Dichloropropane	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	1200 U	--	--	2.5 UJ	--	2.5 UJ	2.5 UJ	2.5 U
2-Hexanone	2000 U	5.0 UJ	10 U	12 UJ	5.0 UJ	5.0 U	10 U	5.0 UJ	5 UJ	2500 UJ	1000 U	10 U	5.0 UJ	10 U	5.0 UJ	5.0 UJ	5.0 U
4-Chlorotoluene	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	1200 U	--	--	2.5 UJ	--	2.5 UJ	2.5 UJ	2.5 U
Acetone	2000 U	5.0 UJ	10 U	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 UJ	5 U	2500 U	1000 U	10 U	5.0 UJ	10 U	5.0 UJ	5.0 UJ	5.0 U
Benzene	140 J	0.50 U	0.30 J	1.2 U	0.16 J	0.50 U	1.0 U	0.50 U	0.5 U	250 U	13 J	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Bromobenzene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Bromodichloromethane	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Bromoform	800 U	2.0 U	1.0 U	5.0 U	2.0 U	2.0 U	1.0 UJ	2.0 U	2 U	1000 U	100 U	1.0 U	2.0 U	1.0 UJ	2.0 U	2.0 U	2.0 U
Bromomethane	1000 U	2.5 UJ	1.0 U	6.2 UJ	2.5 UJ	2.5 UJ	1.0 U	2.5 UJ	2.5 U	1200 U	100 U	1.0 U	2.5 UJ	1.0 U	2.5 UJ	2.5 UJ	2.5 UJ
Butylbenzene, n-	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	0.90 J	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	5.3	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Carbon Disulfide	2000 U	5.0 U	1.0 U	12 UJ	5.0 U	5.0 UJ	1.0 U	5.0 U	5 U	2500 U	1000 U	1.0 U	5.0 U	1.0 U	5.0 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-085	GP-1S	HW-6	HW-6	HW-6	HW-8	HW-10	HW-10	MW-1	MW-7D	MW-7D	MW-11D	MW-11D	MW-12	MW-12	MW-13	MW-13
Sample Depth (feet bgs)	32-35	8-13	6-16	6-16	6-16	6-16	7-17	7-17	15-20	35-45	35-45	35-45	35-45	4-14	4-14	8-18	8-18
Sample Date	10/19/2022	10/19/2017	11/3/2016	3/16/2017	10/19/2017	3/16/2017	11/3/2016	10/17/2017	11/4/2016	11/4/2016	11/4/2016	11/4/2016	10/18/2017	11/3/2016	10/18/2017	10/17/2017	3/20/2018
Shallow or Deep WBZ	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	Split	N	N	N	N	N	N
Analyte																	
Carbon Tetrachloride	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	1000 U	2.5 U	0.36 J	6.2 U	2.5 U	2.5 U	0.31 J	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	1000 U	2.5 UJ	1.0 U	6.2 UJ	2.5 UJ	2.5 UJ	1.0 U	2.5 UJ	2.5 UJ	1200 UJ	100 U	1.0 U	2.5 UJ	1.0 U	2.5 UJ	2.5 UJ	2.5 U
Chloroethane	1000 U	2.5 U	1.0 U	6.2 UJ	2.5 U	2.5 UJ	1.0 U	2.5 U	2.5 UJ	1200 UJ	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 UJ
Chloroform	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Chloromethane	1000 U	2.5 UJ	1.0 U	6.2 U	2.5 UJ	2.5 U	1.0 UJ	2.5 UJ	2.5 U	1200 U	100 U	1.0 U	2.5 UJ	1.0 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Dibromochloromethane	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	2000 U	5.0 UJ	--	12 UJ	5.0 UJ	5.0 UJ	--	5.0 UJ	5 UJ	2500 UJ	--	--	5.0 UJ	--	5.0 UJ	5.0 UJ	5.0 U
Dichlorodifluoromethane	2000 U	5.0 UJ	--	12 U	5.0 UJ	5.0 U	--	5.0 UJ	5 U	2500 U	--	--	5.0 UJ	--	5.0 UJ	5.0 UJ	5.0 U
Ethylbenzene	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	1000 U	2.5 U	1.1	6.2 U	2.5 U	2.5 U	2.8	1.2 J	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	2000 U	5.0 UJ	10 U	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 UJ	5 UJ	2500 UJ	1000 U	10 U	5.0 UJ	10 U	5.0 UJ	5.0 UJ	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2000 U	5.0 UJ	10 U	12 U	5.0 UJ	5.0 U	10 U	5.0 UJ	5 U	2500 U	1000 U	10 U	5.0 UJ	10 U	5.0 UJ	5.0 UJ	5.0 U
Methyl tert-butyl Ether	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Methylene Chloride	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Naphthalene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	100 U	--	2.5 U	--	2.5 U	2.5 U	2.5 U
n-Propylbenzene	1000 U	2.5 UJ	--	6.2 U	2.5 UJ	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	1000 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	2.5 U	2.5 U	1200 U	--	--	2.5 U	--	2.5 U	2.5 U	2.5 U
Styrene	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	--	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	200 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.0 U	0.50 U	0.5 U	250 U	100 U	1.0 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Toluene	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Trichloroethene	210000	18	0.62 J	0.59 J	0.50 U	0.50 U	1.0 U	0.24 J	0.5 U	2500	2300	0.32 J	0.18 J	16	18	22	1.6
Trichlorofluoromethane	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	2000 U	5.0 U	--	12 U	5.0 U	5.0 U	--	5.0 U	5 U	2500 U	--	--	5.0 U	--	5.0 U	5.0 U	5.0 UJ
Vinyl Chloride	1400	0.33 J	430	210	250	1.0 U	1.0 U	1.0 U	1 U	6600	5400	5.1	4.8 J	1.0 U	1.0 UJ	1.3	1.0 UJ
Xylene, m- & p-	1000 U	2.5 U	10 U	6.2 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	1200 U	1000 U	10 U	2.5 U	10 U	2.5 U	2.5 U	2.5 U
Xylene, o-	1000 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1200 U	100 U	1.0 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	1000 U	2.5 U	10 U	6.2 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	1200 U	1000 U	10 U	2.5 U	10 U	2.5 U	2.5 U	2.5 U
Total CBTEX	140 J	2.5 U	1.4 J	6.2 U	0.16 J	2.5 U	2.8	1.2 J	2.5 U	1200 U	13 J	10 U	2.5 U	10 U	2.5 U	2.5 U	2.5 U
Total CVOC	290320	34.33 J	880 J	410.59 J	432.44 J	5 UJ	1.0 U	0.24 J	2.5 UJ	55000 J	56000	5.9 J	4.98 J	29 J	55	28.8	2.59
Total VOC	290460	34.33 J	877.01	410.59 J	432.6 J	250 UJ	3.11	7.64 J	--	101260	56000 J	5.93	4.98 J	29.19	55	28.8	2.59

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-13	MW-13	MW-13	MW-13	MW-13	MW-14D	MW-14D	MW-14S	MW-14S	MW-14S	MW-15D	MW-15D	MW-15D	MW-15D	MW-15S	MW-15S	MW-16D
Sample Depth (feet bgs)	8-18	8-18	8-18	8-18	8-18	40-50	40-50	10-20	10-20	10-20	34-44	34-44	34-44	34-44	10-20	10-20	36-46
Sample Date	11/13/2018	11/5/2019	10/28/2020	10/6/2021	10/6/2022	11/1/2016	10/18/2017	11/1/2016	11/1/2016	10/18/2017	11/1/2016	10/18/2017	10/18/2017	10/29/2020	11/1/2016	10/18/2017	11/1/2016
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Shallow	Shallow	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
1,1,2,2-Tetrachloroethane	0.50 UJ	0.50 UJ	0.5 UJ	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 UJ	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.0 U	1.5 UJ	1.0 U	1.0 U	1.5 UJ	600 U	1500 UJ	1500 UJ	75 U	1.0 U	1.5 UJ	1.0 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
1,1-Dichloroethene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	140 J	220 J	200 J	42	1.0 U	0.50 U	1.0 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 UJ	--	2.5 U	--
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 UJ	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	1.8 J	0.70 J	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,2-Dibromo-3-Chloropropane	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	--	2.5 UJ	--	--	2.5 UJ	1000 U	2500 UJ	2500 UJ	120 UJ	--	2.5 UJ	--
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2.0 U	2 U	2 U	2.0 U	--	2.0 U	--	--	2.0 U	800 U	2000 U	2000 U	100 U	--	2.0 U	--
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
1,2-Dichloroethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 UJ	1.0 U	1.0 U	0.50 U	200 U	500 UJ	500 UJ	25 U	1.0 U	0.50 UJ	1.0 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	2.5 U	8.2	1.0 U	2.5 U	1.4	1.2	2.4 J	46000	76000	77000	8000	1.4	1.0 J	1.0 U
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	2.5 U	8.2	--	2.5 U	--	--	2.4 J	46000	76000	77000	8100 J	--	1.0 J	--
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	50 J	1.0 U	2.5 U	1.0 U
1,2-Dichloropropane	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	400 U	1000 U	1000 U	50 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	2.5 U	5.0 U	5.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	5.0 U	2.5 U	5.0 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	--	--	2.5 UJ	1000 U	2500 UJ	2500 UJ	120 U	--	2.5 UJ	--
1,3-Dichloropropene, cis-	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
1,3-Dichloropropene, Total	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	--	0.50 U	--	--	0.50 U	200 U	500 U	500 U	25 U	--	0.50 U	--
1,3-Dichloropropene, trans-	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
1,4-Dioxane (p-Dioxane)	250 UJ	250 U	250 U	250 U	250 U	--	250 U	--	--	250 U	100000 UJ	250000 U	250000 U	12000 UJ	--	250 U	--
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	--	--	2.5 UJ	1000 U	2500 UJ	2500 UJ	120 U	--	2.5 UJ	--
2-Hexanone	5.0 U	5.0 U	5 U	5 U	5.0 U	10 U	5.0 UJ	10 U	10 U	5.0 UJ	2000 UJ	5000 UJ	5000 UJ	250 U	10 U	5.0 UJ	10 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	--	--	2.5 UJ	1000 U	2500 UJ	2500 UJ	120 U	--	2.5 UJ	--
Acetone	5.0 U	5.0 U	5 UJ	5 U	5.0 U	10 U	5.0 UJ	10 U	10 U	5.0 UJ	2000 U	5000 UJ	5000 UJ	250 UJ	10 U	5.0 UJ	10 U
Benzene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Bromodichloromethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
Bromoform	2.0 U	2.0 U	2 U	2 U	2.0 U	1.0 UJ	2.0 U	1.0 UJ	1.0 UJ	2.0 U	800 U	2000 U	2000 U	100 U	1.0 UJ	2.0 U	1.0 UJ
Bromomethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	1.0 U	2.5 UJ	1.0 U	1.0 U	2.5 UJ	1000 UJ	2500 UJ	2500 UJ	120 UJ	1.0 U	2.5 UJ	1.0 U
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Carbon Disulfide	5.0 U	5.0 U	5 U	5 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	5.0 U	2000 U	5000 U	5000 U	250 U	1.0 U	5.0 U	1.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-13	MW-13	MW-13	MW-13	MW-13	MW-14D	MW-14D	MW-14S	MW-14S	MW-14S	MW-15D	MW-15D	MW-15D	MW-15D	MW-15S	MW-15S	MW-16D
Sample Depth (feet bgs)	8-18	8-18	8-18	8-18	8-18	40-50	40-50	10-20	10-20	10-20	34-44	34-44	34-44	34-44	10-20	10-20	36-46
Sample Date	11/13/2018	11/5/2019	10/28/2020	10/6/2021	10/6/2022	11/1/2016	10/18/2017	11/1/2016	11/1/2016	10/18/2017	11/1/2016	10/18/2017	10/18/2017	10/29/2020	11/1/2016	10/18/2017	11/1/2016
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Shallow	Shallow	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N
Analyte																	
Carbon Tetrachloride	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 UJ	1.0 U	1.0 U	2.5 UJ	1000 UJ	2500 UJ	2500 UJ	120 U	1.0 U	2.5 UJ	1.0 U
Chloroethane	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 UJ	2500 U	2500 U	120 UJ	1.0 U	2.5 U	1.0 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Chloromethane	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	1.0 UJ	2.5 UJ	1.0 UJ	1.0 UJ	2.5 UJ	1000 U	2500 UJ	2500 UJ	120 U	1.0 UJ	2.5 UJ	1.0 UJ
Dibromochloromethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
Dibromomethane (Methylene Bromide)	5.0 U	5.0 U	5 U	5 U	5.0 U	--	5.0 UJ	--	--	5.0 UJ	2000 UJ	5000 UJ	5000 UJ	250 U	--	5.0 UJ	--
Dichlorodifluoromethane	5.0 U	5.0 UJ	5 U	5 U	5.0 U	--	5.0 UJ	--	--	5.0 UJ	2000 U	5000 UJ	5000 UJ	250 U	--	5.0 UJ	--
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	3	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Methyl Ethyl Ketone (2-Butanone)	5.0 U	5.0 U	5 UJ	5 U	5.0 U	10 U	5.0 UJ	10 U	10 U	5.0 UJ	2000 UJ	5000 UJ	5000 UJ	250 U	10 U	5.0 UJ	10 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 U	5.0 U	5 U	5 UJ	5.0 U	10 U	5.0 UJ	10 U	10 U	5.0 UJ	2000 UJ	5000 UJ	5000 UJ	250 U	10 U	5.0 UJ	10 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Naphthalene	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 UJ	--	2.5 U	--
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 UJ	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U	--	--	2.5 U	1000 U	2500 U	2500 U	120 U	--	2.5 U	--
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Tetrachloroethene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	0.50 U	1.0 U	1.0 U	0.50 U	200 U	500 U	500 U	25 U	1.0 U	0.50 U	1.0 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Trichloroethene	0.50 U	0.50 U	0.29 J	0.72	38	1.0 U	0.50 U	9.6	11	14	12000	15000	16000	940 J	4.5	5.6	1.0 U
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Vinyl Acetate	5.0 U	5.0 UJ	5 U	5 U	5.0 U	--	5.0 U	--	--	5.0 U	2000 U	5000 U	5000 U	250 U	--	5.0 U	--
Vinyl Chloride	1.0 UJ	1.0 U	1 U	1 U	0.15 J	6.9	7.7 J	1.0 U	1.0 U	1.0 U	2600	4100 J	4000 J	4300	1.0 U	1.0 UJ	0.40 J
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	9.3	10 U	2.5 U	10 U	10 U	2.5 U	1000 U	2500 U	2500 U	120 U	10 U	2.5 U	10 U
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	1.0 U	1.0 U	2.5 U	1000 U	2500 U	2500 U	120 U	1.0 U	2.5 U	1.0 U
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	9.3	10 U	2.5 U	10 U	10 U	2.5 U	1000 U	2500 U	2500 U	120 U	10 U	2.5 U	10 U
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	12.3	10 U	2.5 U	10 U	10 U	2.5 U	1000 U	2500 U	2500 U	120 U	10 U	2.5 U	10 U
Total CVOC	1.0 UJ	5.0 UJ	0.29 J	0.72	46.35	6.9	7.7 J	11	12	16.4 J	61000 J	95320 J	97200 J	13332	5.9	6.6 J	0.40 J
Total VOC	5.0 U	250 UJ	0.29	2.52	67.55	6.9	7.7 J	11	12.2	16.4 J	106740	95320 J	97200 J	21432	5.9	6.6 J	0.4

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-18	MW-18	MW-18	MW-18	MW-19D	MW-19D	MW-19S	MW-20	MW-20	MW-20	MW-20
Sample Depth (feet bgs)	36-46	36-46	36-46	36-46	36-46	36-46	5-15	5-15	5-15	5-15	34-44	34-44	9-19	6.5-11.5	6.5-11.5	6.5-11.5	6.5-11.5
Sample Date	10/18/2017	11/14/2018	11/7/2019	10/28/2020	10/6/2021	10/6/2022	3/15/2017	11/6/2019	10/5/2021	10/4/2022	11/2/2016	10/17/2017	3/14/2017	11/3/2016	10/19/2017	11/15/2018	11/6/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	0.50 U	0.50 UJ	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 UJ	0.50 UJ	0.50 U
1,1,2-Trichloroethane	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	3.8 UJ	1.5 U	1.5 U	1.5 U	1.0 U	1.5 UJ	1.5 UJ	1.0 U	1.5 UJ	1.5 U	1.5 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 UJ	2.5 U	2.5 UJ
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	2.5 U	--	2.5 UJ	2.5 UJ	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	5.0 U	2.0 U	2 U	2.0 U	--	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	0.50 UJ	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 UJ	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	65	18	18	4.3	66	2.5 U	2.5 U	1.1	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	65	18	18	4.3	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	0.55 J	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	1.0 U	1.0 U	1.0 U	1 U	1 U	1.0 U	2.5 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	5.0 U	2.5 U	2.5 U	5.0 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	2.5 U
1,3-Dichloropropene, cis-	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	--	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	250 U	250 UJ	250 U	250 U	250 U	250 U	620 U	250 U	250 U	250 U	--	250 U	250 U	--	250 U	250 UJ	250 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	2.5 U
2-Hexanone	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	12 UJ	5.0 U	5 U	5.0 U	10 U	5.0 UJ	5.0 U	10 U	5.0 UJ	5.0 U	5.0 U
4-Chlorotoluene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ	2.5 U	--	2.5 UJ	2.5 U	2.5 U
Acetone	5.0 UJ	5.0 U	2.5 J	5 U	5 U	5.0 U	12 UJ	2.6 J	5 U	5.0 U	10 U	5.0 UJ	5.0 UJ	10 U	5.0 UJ	5.0 U	2.2 J
Benzene	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	0.20 J	0.50 U	0.50 U	0.50 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Bromoform	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	5.0 U	2.0 U	2 U	2.0 U	1.0 UJ	2.0 U	2.0 U	1.0 UJ	2.0 U	2.0 U	2.0 U
Bromomethane	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	6.2 UJ	2.5 UJ	2.5 U	2.5 U	1.0 U	2.5 UJ	2.5 UJ	1.0 U	2.5 UJ	2.5 U	2.5 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Carbon Disulfide	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	12 UJ	5.0 U	5 U	5.0 U	1.0 U	5.0 U	5.0 UJ	1.0 U	5.0 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-16D	MW-18	MW-18	MW-18	MW-18	MW-19D	MW-19D	MW-19S	MW-20	MW-20	MW-20	MW-20
Sample Depth (feet bgs)	36-46	36-46	36-46	36-46	36-46	36-46	5-15	5-15	5-15	5-15	34-44	34-44	9-19	6.5-11.5	6.5-11.5	6.5-11.5	6.5-11.5
Sample Date	10/18/2017	11/14/2018	11/7/2019	10/28/2020	10/6/2021	10/6/2022	3/15/2017	11/6/2019	10/5/2021	10/4/2022	11/2/2016	10/17/2017	3/14/2017	11/3/2016	10/19/2017	11/15/2018	11/6/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																	
Carbon Tetrachloride	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 UJ	2.5 U	2.5 U	2.5 U	1.0 U	2.5 UJ	2.5 UJ	1.0 U	2.5 UJ	2.5 U	2.5 U
Chloroethane	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	6.2 UJ	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 UJ	1.0 U	2.5 U	2.5 U	2.5 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Chloromethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 U	2.5 UJ	1.0 UJ	2.5 UJ	2.5 U	1.0 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	12 UJ	5.0 U	5 U	5.0 U	--	5.0 UJ	5.0 UJ	--	5.0 UJ	5.0 U	5.0 U
Dichlorodifluoromethane	5.0 UJ	5.0 U	5.0 UJ	5 U	5 U	5.0 U	12 U	5.0 UJ	5 U	5.0 U	--	5.0 UJ	5.0 U	--	5.0 UJ	5.0 U	5.0 UJ
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	100	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	20	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	12 UJ	5.0 U	5 U	5.0 U	10 U	5.0 UJ	5.0 UJ	10 U	5.0 UJ	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 UJ	5.0 U	5.0 U	5 U	5 UJ	5.0 U	12 U	5.0 U	5 UJ	5.0 U	10 U	5.0 UJ	5.0 U	10 U	5.0 UJ	5.0 U	5.0 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Naphthalene	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	6.2 UJ	2.5 U	2.5 UJ	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 UJ	2.5 U	2.5 U
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	--	2.5 U	2.5 U	--	2.5 U	2.5 U	2.5 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.2 U	0.50 U	0.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Trichloroethene	0.50 U	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 U	190	38	130	44	1.1	0.51	0.49 J	2.3	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	12 U	5.0 UJ	5 U	5.0 U	--	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 UJ
Vinyl Chloride	0.31 J	0.41 J	0.43 J	0.3 J	0.29 J	0.61 J	0.34 J	1.0 U	1 U	1.0 U	25	21 J	0.22 J	1.0 U	0.17 J	1.0 U	1.0 U
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	240	2.5 U	2.5 U	0.82 J
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U	2.5 U	1.8	2.5 U	2.5 U	2.5 U
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	240	2.5 U	2.5 U	0.82 J
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U	2.5 U	360 J	2.5 U	2.5 U	0.82 J
Total CVOC	0.31 J	0.41 J	0.43 J	0.3 J	0.29 J	0.61 J	255.34 J	56	148	48.3	93 J	21.51 J	0.71 J	3.4	0.17 J	1.0 U	1.0 U
Total VOC	0.31 J	0.41	2.9 J	0.3	0.29	0.61	255.34 J	59 J	166	52.6	92.65	21.51 J	0.71 J	365.4	0.17 J	5.0 U	5.0 UJ

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-20	MW-20	MW-20	MW-21D	MW-21D	MW-21D	MW-21D	MW-21D	MW-22D	MW-22D	MW-22D	MW-23D	MW-23S	MW-23S	MW-23S	MW-23S	MW-23S
Sample Depth (feet bgs)	6.5-11.5	6.5-11.5	6.5-11.5	31.5-41	31.5-41	31.5-41	31.5-41	31.5-41	32.5-42	32.5-42	32.5-42	28-37.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5
Sample Date	10/29/2020	10/6/2021	10/5/2022	11/2/2016	11/2/2016	3/14/2017	10/19/2017	10/29/2020	11/3/2016	10/17/2017	10/29/2020	11/2/2016	11/2/2016	10/17/2017	11/13/2018	11/5/2019	11/5/2019
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD
Analyte																	
1,1,1,2-Tetrachloroethane	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 UJ	100 UJ	5 U	2.5 U	2 UJ	0.5 U	1.0 U	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	3 U	1.5 U	1.5 U	50 U	50 U	1500 UJ	300 UJ	300 U	15 U	7.5 UJ	6 U	1.5 U	1.0 U	1.5 UJ	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	1 U	0.5 U	0.50 U	120	100	500 U	100 U	42 J	5 U	1.2 J	2.5	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 UJ	25 U	12 U	10 UJ	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	5 U	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 UJ	25 U	12 U	10 UJ	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	16	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	5 U	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 UJ	25 U	12 UJ	10 UJ	2.5 U	--	2.5 UJ	2.5 UJ	2.5 U	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	4 U	2 U	2.0 U	--	--	2000 U	400 U	400 U	20 U	10 U	8 U	2 U	--	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethene, cis-	5 U	2.5 U	2.5 U	120000	110000	79000	16000	26000	190	190	440	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, Total	5 U	2.5 U	2.5 U	120000	110000	79000	16000	26000 J	190	190	440	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, trans-	5 U	2.5 U	2.5 U	440	460	2500 U	500 U	170 J	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	2 U	1 U	1.0 U	50 U	50 U	1000 U	200 U	200 U	10 U	5.0 U	4 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	6.6	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	5 U	2.5 U	2.5 U	250 U	250 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	5 U	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 U	25 U	12 UJ	10 U	2.5 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U
1,3-Dichloropropene, cis-	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	1 U	0.5 U	0.50 U	--	--	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	--	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	500 U	250 U	250 U	--	--	250000 U	50000 U	50000 U	2500 UJ	1200 U	1000 U	250 UJ	--	250 U	250 UJ	250 U	250 U
2,2-Dichloropropane	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	5 U	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 U	25 U	12 UJ	10 U	2.5 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U
2-Hexanone	10 U	5 U	5.0 U	500 U	500 U	5000 UJ	1000 UJ	1000 U	50 UJ	25 UJ	20 U	5 UJ	10 U	5.0 UJ	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	5 U	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 U	25 U	12 UJ	10 U	2.5 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U
Acetone	10 U	5 U	5.0 U	13000	11000	5000 J	1000 UJ	1000 UJ	50 U	25 UJ	20 UJ	5 U	10 U	5.0 UJ	5.0 U	5.0 U	5.0 U
Benzene	1 U	0.5 U	0.50 U	31 J	29 J	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	0.20 J	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	4 U	2 U	2.0 U	50 UJ	50 UJ	2000 U	400 U	400 U	20 U	10 U	8 U	2 U	1.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U
Bromomethane	5 UJ	2.5 U	2.5 U	50 U	50 U	2500 UJ	500 UJ	500 UJ	25 U	12 UJ	10 UJ	2.5 U	1.0 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Butylbenzene, n-	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	10 U	5 U	5.0 U	50 U	50 U	5000 UJ	1000 U	1000 U	50 U	25 U	20 U	5 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-20	MW-20	MW-20	MW-21D	MW-21D	MW-21D	MW-21D	MW-21D	MW-22D	MW-22D	MW-22D	MW-23D	MW-23S	MW-23S	MW-23S	MW-23S	MW-23S
Sample Depth (feet bgs)	6.5-11.5	6.5-11.5	6.5-11.5	31.5-41	31.5-41	31.5-41	31.5-41	31.5-41	32.5-42	32.5-42	32.5-42	28-37.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5
Sample Date	10/29/2020	10/6/2021	10/5/2022	11/2/2016	11/2/2016	3/14/2017	10/19/2017	10/29/2020	11/3/2016	10/17/2017	10/29/2020	11/2/2016	11/2/2016	10/17/2017	11/13/2018	11/5/2019	11/5/2019
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD
Analyte																	
Carbon Tetrachloride	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	0.32 J	2.5 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	5 U	2.5 U	2.5 U	50 U	50 U	2500 UJ	500 UJ	500 U	25 UJ	12 UJ	10 U	2.5 UJ	1.0 U	2.5 UJ	2.5 U	2.5 U	2.5 U
Chloroethane	5 UJ	2.5 U	2.5 U	50 U	50 U	2500 UJ	500 U	500 UJ	25 UJ	12 U	10 UJ	2.5 UJ	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroform	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	5 U	2.5 U	2.5 U	50 UJ	50 UJ	2500 U	500 UJ	500 U	25 U	12 UJ	10 U	2.5 U	1.0 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Dibromochloromethane	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	10 U	5 U	5.0 U	--	--	5000 UJ	1000 UJ	1000 U	50 UJ	25 UJ	20 U	5 U	--	5.0 UJ	5.0 U	5.0 U	5.0 U
Dichlorodifluoromethane	10 U	5 U	5.0 U	--	--	5000 U	1000 UJ	1000 U	50 U	25 UJ	20 U	5 U	--	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ
Ethylbenzene	220	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	5.1	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	46	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	5.9	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	10 U	5 U	5.0 U	500 U	500 U	5000 UJ	1000 UJ	1000 UJ	50 UJ	25 UJ	20 UJ	5 UJ	10 U	5.0 UJ	5.0 U	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	10 U	5 UJ	5.0 U	500 U	500 U	5000 U	1000 UJ	1000 U	50 U	25 UJ	20 U	5 U	10 U	5.0 UJ	5.0 U	5.0 U	5.0 U
Methyl tert-butyl Ether	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	5 UJ	2.5 UJ	2.5 U	--	--	2500 UJ	500 U	500 UJ	15 J	12 U	10 UJ	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
n-Propylbenzene	14	2.5 U	2.5 U	--	--	2500 U	500 UJ	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	5 U	2.5 U	2.5 U	--	--	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	--	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	1 U	0.5 U	0.50 U	50 U	50 U	500 U	100 U	100 U	5 U	2.5 U	2 U	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	0.49 J	0.31 J	0.74	18 J	50 U	500 U	100 U	4000 J	890	700	720 J	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	10 U	5 U	5.0 U	--	--	5000 U	1000 U	1000 U	50 U	25 U	20 U	5 U	--	5.0 U	5.0 U	5.0 UJ	5.0 UJ
Vinyl Chloride	2 U	1 U	1.0 U	39000	37000	40000	16000	7800	1.6 J	2.8 J	7.4	0.67 J	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Xylene, m- & p-	580	2.5 U	2.5 U	500 U	500 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	1.9 J	2.5 U	2.5 U	2.5 U	2.5 U
Xylene, o-	5 U	2.5 U	2.5 U	50 U	50 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	4	2.5 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	580	2.5 U	2.5 U	500 U	500 U	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	5.9 J	2.5 U	2.5 U	2.5 U	2.5 U
Total CBTEX	846	2.5 U	2.5 U	31 J	29 J	2500 U	500 U	500 U	25 U	12 U	10 U	2.5 U	17 J	2.5 U	2.5 U	2.5 U	2.5 U
Total CVOC	0.49 J	0.31 J	0.74	160000 J	150000	119000	32000	38012	1100 J	894 J	1169.9	0.67 J	1.0 U	5 UJ	1.0 UJ	5.0 UJ	5.0 UJ
Total VOC	883.09	0.31	0.74	172609	158589	124000 J	32000	64012	1286.6	894 J	1609.9	0.67	17.42	250 UJ	5.0 U	250 UJ	250 UJ

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-23S	MW-23S	MW-23S	MW-23S	MW-24S	MW-24S	MW-24S	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25S	MW-25S	MW-25S
Sample Depth (feet bgs)	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	31-41	31-41	31-41	31-41	31-41	31-41	31-41	7-17	7-17	7-17
Sample Date	10/28/2020	10/28/2020	10/5/2021	10/4/2022	11/2/2016	10/17/2017	9/18/2019	11/2/2016	10/19/2017	11/13/2018	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	11/2/2016	10/19/2017
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	Split	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
1,1,2,2-Tetrachloroethane	0.5 UJ	0.5 UJ	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 UJ	0.50 UJ	0.50 UJ	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 UJ
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.0 U	3.8 UJ	3.8 U	1.0 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.0 U	1.5 UJ
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
1,2,3-Trichlorobenzene	2.5 UJ	2.5 UJ	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	--	2.5 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ
1,2,4-Trichlorobenzene	2.5 UJ	2.5 UJ	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
1,2,4-Trimethylbenzene	19	20	2.5 U	2.5 U	--	12	15	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
1,2-Dibromo-3-Chloropropane	2.5 UJ	2.5 UJ	2.5 U	2.5 U	--	6.2 UJ	6.2 U	--	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	--	2.5 UJ
1,2-Dibromoethane (Ethylene Dibromide)	2 U	2 U	2 U	2.0 U	--	5.0 U	5.0 U	--	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2 U	--	2.0 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	2.5 U	1	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	28	25	21
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	28	25	21
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
1,2-Dichloropropane	1 U	1 U	1 U	1.0 U	1.0 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.0 U	1 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	3	3.1	2.5 U	2.5 U	--	2.8 J	4.0 J	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	6.2 U	6.2 U	5.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	2.5 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 UJ	6.2 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ
1,3-Dichloropropene, cis-	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
1,3-Dichloropropene, Total	0.5 U	0.5 U	0.5 U	0.50 U	--	1.2 U	1.2 U	--	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	--	0.50 U
1,3-Dichloropropene, trans-	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 U	--	620 U	620 U	--	250 U	250 UJ	250 U	250 UJ	250 U	250 U	250 UJ	--	250 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 UJ	6.2 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ
2-Hexanone	5 U	5 U	5 U	5.0 U	10 U	12 UJ	12 U	10 U	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	5 UJ	10 U	5.0 UJ
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 UJ	6.2 U	--	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ
Acetone	5 UJ	5 UJ	5 U	5.0 U	10 U	12 UJ	12 U	10 U	5.0 UJ	5.0 U	35	5 UJ	2.8 J	5.0 U	5 U	10 U	5.0 UJ
Benzene	0.5 U	0.5 U	0.5 U	0.50 U	0.82 J	0.55 J	0.84 J	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
Bromoform	2 U	2 U	2 U	2.0 U	1.0 U	5.0 U	5.0 U	1.0 UJ	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2 U	1.0 UJ	2.0 U
Bromomethane	2.5 UJ	2.5 UJ	2.5 U	2.5 U	1.0 U	6.2 UJ	6.2 UJ	1.0 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	1.0 U	2.5 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Butylbenzene, sec-	0.94 J	0.98 J	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Carbon Disulfide	5 U	5 U	5 U	5.0 U	1.0 U	12 U	12 U	1.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5 U	1.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-23S	MW-23S	MW-23S	MW-23S	MW-24S	MW-24S	MW-24S	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25D	MW-25S	MW-25S	MW-25S
Sample Depth (feet bgs)	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	5-14.5	31-41	31-41	31-41	31-41	31-41	31-41	31-41	7-17	7-17	7-17
Sample Date	10/28/2020	10/28/2020	10/5/2021	10/4/2022	11/2/2016	10/17/2017	9/18/2019	11/2/2016	10/19/2017	11/13/2018	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	11/2/2016	10/19/2017
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	Split	N
Analyte																	
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	0.43 J	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 UJ	6.2 U	1.0 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	1.0 U	2.5 UJ
Chloroethane	2.5 UJ	2.5 UJ	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	1.0 U	2.5 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Chloromethane	2.5 U	2.5 U	2.5 U	2.5 UJ	1.0 UJ	6.2 UJ	6.2 U	1.0 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	1.0 UJ	2.5 UJ
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
Dibromomethane (Methylene Bromide)	5 U	5 U	5 U	5.0 U	--	12 UJ	12 U	--	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	5 U	--	5.0 UJ
Dichlorodifluoromethane	5 U	5 U	5 U	5.0 U	--	12 UJ	12 U	--	5.0 UJ	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5 U	--	5.0 UJ
Ethylbenzene	2 J	2 J	2.5 U	1.2 J	580	41	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Isopropylbenzene (Cumene)	5.8	6.1	2.5 U	1.1 J	88	34	29	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Methyl Ethyl Ketone (2-Butanone)	5 UJ	5 UJ	5 U	5.0 U	10 U	12 UJ	12 U	10 U	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	5 UJ	10 U	5.0 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5 U	5 U	5 U	5.0 U	10 U	12 UJ	12 U	10 U	5.0 UJ	5.0 U	5.0 U	5 U	5 U	5.0 U	5 U	10 U	5.0 UJ
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Naphthalene	4.8 J	4.9 J	2.5 U	0.87 J	--	8.7	6.5	--	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	--	2.5 U
n-Propylbenzene	6.7	7	2.5 U	2.5 U	--	7.6	6.8	--	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 UJ
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	6.2 U	--	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	2.5 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	1.0 U	0.50 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	6.5	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Trichloroethene	0.5 UJ	0.5 UJ	0.5 U	0.50 U	1.0 U	1.2 U	1.2 U	1.0 U	0.50 U	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 U	91	78	82
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Vinyl Acetate	5 U	5 U	5 U	5.0 U	--	12 U	12 U	--	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5 U	--	5.0 U
Vinyl Chloride	1 U	1 U	1 U	1.0 U	1.0 U	2.5 U	2.5 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1 U	1 U	1.0 U	1 U	1.0 U	1.0 U
Xylene, m- & p-	1 J	0.93 J	2.5 U	2.5 U	1200	670	510	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U
Xylene, o-	2.5 U	2.5 U	2.5 U	5.9	460	14	6.2 U	1.0 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	2.5 U
Xylenes, Total	1 J	0.93 J	2.5 U	5.9	1700	680	510	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U
Total CBTEX	8.8	9.03	2.5 U	8.2	2300 J	759.55 J	540 J	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10 U	2.5 U
Total CVOC	1 U	1 U	1 U	1.0 U	1.0	12 UJ	12 U	1.0 U	5 UJ	2.5 U	2.5 U	1 U	1 U	1.0 U	120	100	103
Total VOC	43.24	45.01	5 U	9.07	2336.75	790.65 J	570 J	10 U	250 UJ	5.0 U	5.0 UJ	5 U	2.8	5.0 U	91	78	103

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-25S	MW-25S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-27S	MW-27S	MW-27S
Sample Depth (feet bgs)	7-17	7-17	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	10-20	10-20	10-20
Sample Date	10/5/2021	10/4/2022	11/2/2016	11/2/2016	11/2/2016	3/16/2017	10/19/2017	11/13/2018	11/13/2018	11/13/2018	9/18/2019	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	10/19/2017	11/13/2018
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	Split	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,1,1-Trichloroethane	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 UJ	10 UJ	12 U	12 UJ	12 UJ	12 UJ	20 U	5.0 U	5 U	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	3.8 U	1.5 U	150 U	1.0 U	1.0 U	150 UJ	30 UJ	38 U	30 U	38 U	38 U	38 U	38 U	60 U	15 U	15 U	1.5 UJ	1.5 U
1,1-Dichloroethane	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,1-Dichloroethene	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
1,1-Dichloropropene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 UJ	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	6.2 U	2.5 U	250 U	--	--	250 U	50 UJ	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 UJ	2.5 U
1,2,4-Trichlorobenzene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 UJ	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	6.2 U	2.5 U	3800	--	--	3900	2800	4500 J	2400 J	3800	3200	3900	4300	4400	25 U	14	3.1	3.1
1,2-Dibromo-3-Chloropropane	6.2 U	2.5 U	250 U	--	--	250 U	50 UJ	62 UJ	50 UJ	62 U	62 U	62 UJ	100 U	25 U	25 U	2.5 UJ	2.5 UJ	2.5 UJ
1,2-Dibromoethane (Ethylene Dibromide)	5 U	2.0 U	200 U	--	--	200 U	40 U	50 U	40 U	50 U	50 U	50 U	80 U	20 U	20 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,2-Dichloroethane	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
1,2-Dichloroethene, cis-	18	6.4	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,2-Dichloroethene, Total	18	6.4	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,2-Dichloroethene, trans-	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,2-Dichloropropane	2.5 U	1.0 U	100 U	1.0 U	1.0 U	100 U	20 U	25 U	20 U	25 U	25 U	25 U	25 U	40 U	10 U	10 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	6.2 U	2.5 U	1000	--	--	1100	660	840	800	440	340	110	100	35	25 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	6.2 U	2.5 U	250 U	5.0 U	5.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,3-Dichloropropane	6.2 U	2.5 U	250 U	--	--	250 U	50 UJ	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 UJ	2.5 U
1,3-Dichloropropene, cis-	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	1.2 U	0.50 U	50 U	--	--	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
1,4-Dichlorobenzene	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	620 U	250 U	25000 UJ	--	--	25000 U	5000 U	6200 UJ	5000 UJ	6200 U	6200 U	6200 U	6200 U	10000 U	2500 U	2500 UJ	250 U	250 UJ
2,2-Dichloropropane	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
2-Chlorotoluene	6.2 U	2.5 U	250 U	--	--	250 U	50 UJ	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 UJ	2.5 U
2-Hexanone	12 U	5.0 U	500 UJ	10 U	10 U	500 UJ	100 UJ	120 U	100 U	120 U	120 U	120 U	120 U	200 U	50 U	50 UJ	5.0 UJ	5.0 U
4-Chlorotoluene	6.2 U	2.5 U	250 U	--	--	250 U	50 UJ	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 UJ	2.5 U
Acetone	12 U	5.0 U	500 U	10 U	10 U	500 UJ	100 UJ	120 U	100 U	120 U	120 U	120 UJ	200 U	50 U	50 U	5.0 UJ	5.0 UJ	5.0 U
Benzene	1.2 U	0.50 U	50 U	0.32 J	0.35 J	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
Bromobenzene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
Bromodichloromethane	1.2 U	0.20 J	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
Bromoform	5 U	2.0 U	200 U	1.0 UJ	1.0 UJ	200 U	40 U	50 U	40 U	50 U	50 U	50 U	50 U	80 U	20 U	20 U	2.0 U	2.0 U
Bromomethane	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 UJ	50 UJ	62 UJ	50 UJ	62 UJ	62 UJ	62 UJ	62 UJ	100 U	25 U	25 U	2.5 UJ	2.5 UJ
Butylbenzene, n-	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	22 J	25 U	2.5 U	2.5 U
Butylbenzene, sec-	6.2 U	2.5 U	250 U	--	--	250 U	15 J	62 U	50 U	62 U	62 U	62 U	62 U	100 U	28	25 U	2.5 U	2.5 U
Butylbenzene, t-	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
Carbon Disulfide	12 U	5.0 U	500 U	1.0 U	1.0 U	500 UJ	100 U	120 U	100 U	120 U	120 U	120 U	120 U	200 U	50 U	50 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-25S	MW-25S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-26S	MW-27S	MW-27S	MW-27S
Sample Depth (feet bgs)	7-17	7-17	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	5-15	10-20	10-20	10-20
Sample Date	10/5/2021	10/4/2022	11/2/2016	11/2/2016	11/2/2016	3/16/2017	10/19/2017	11/13/2018	11/13/2018	9/18/2019	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	10/19/2017	11/13/2018	
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	Split	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N
Analyte																		
Carbon Tetrachloride	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U
Chlorobenzene	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U
Chlorobromomethane	6.2 U	2.5 U	250 UJ	1.0 U	1.0 U	250 UJ	50 UJ	62 U	50 U	62 U	62 U	62 U	62 U	100 U	25 U	25 UJ	2.5 UJ	2.5 U
Chloroethane	6.2 U	2.5 U	250 UJ	1.0 U	1.0 U	250 UJ	50 U	62 U	50 U	62 U	62 U	62 UJ	100 U	25 U	25 UJ	2.5 U	2.5 U	2.5 U
Chloroform	6.2 U	1.1 J	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Chloromethane	6.2 U	2.5 UJ	250 U	1.0 UJ	1.0 UJ	250 U	50 UJ	62 UJ	50 UJ	62 U	62 UJ	62 U	100 U	25 UJ	25 U	2.5 UJ	2.5 UJ	2.5 UJ
Dibromochloromethane	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	12 U	5.0 U	500 U	--	--	500 UJ	100 UJ	120 U	100 U	120 U	120 U	120 U	200 U	50 U	50 U	5.0 UJ	5.0 U	5.0 U
Dichlorodifluoromethane	12 U	5.0 U	500 U	--	--	500 U	100 UJ	120 U	100 U	120 U	120 UJ	120 U	200 U	50 U	50 U	5.0 UJ	5.0 U	5.0 U
Ethylbenzene	6.2 U	2.5 U	480	470	460	240 J	270	230	220	130	290	160	110	150	25 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	6.2 U	2.5 U	92 J	140	140	70 J	82	130	130	130	110	130	160	160	25 U	9.6	2.2 J	2.2 J
Methyl Ethyl Ketone (2-Butanone)	12 U	5.0 U	500 UJ	10 U	10 U	500 UJ	100 UJ	120 U	100 U	120 U	120 U	120 UJ	200 U	50 U	50 UJ	5.0 UJ	5.0 UJ	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	12 U	5.0 U	500 U	10 U	10 U	500 U	100 UJ	120 U	100 U	120 U	120 U	120 U	200 U	50 U	50 U	5.0 UJ	5.0 UJ	5.0 U
Methyl tert-butyl Ether	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Naphthalene	6.2 U	2.5 U	91 J	--	--	250 U	74 J	81	85	92	91	64 J	95 J	150 J	25 U	4.5	2.5 U	2.5 U
n-Propylbenzene	6.2 U	2.5 U	580	--	--	510	390 J	610	590	530	460	600	670	810	25 U	7.8 J	1.7 J	1.7 J
p-Isopropyltoluene	6.2 U	2.5 U	250 U	--	--	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	15 J	25 U	2.5 U	2.5 U	2.5 U
Styrene	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	1.2 U	0.50 U	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 U	20 U	5.0 U	5 U	0.50 U	0.50 U	0.50 U
Toluene	6.2 U	2.5 U	250 U	1.3	1.3	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Trichloroethene	310	79	50 U	1.0 U	1.0 U	50 U	10 U	12 U	10 U	12 U	12 U	12 UJ	20 U	4.0 J	5 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane	6.2 U	2.5 U	250 U	1.0 U	1.0 U	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	12 U	5.0 U	500 U	--	--	500 U	100 U	120 U	100 U	120 U	120 UJ	120 U	200 U	50 U	50 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	2.5 U	1.0 U	100 U	1.0 U	1.0 U	100 U	20 U	25 UJ	20 UJ	25 U	25 U	25 U	40 U	10 U	10 U	1.0 U	1.0 UJ	1.0 UJ
Xylene, m- & p-	6.2 U	2.5 U	1100	980	990	480	440	440	430	120	230	31 J	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Xylene, o-	6.2 U	2.5 U	250 U	1.2	1.1	250 U	50 U	62 U	50 U	62 U	62 U	62 U	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	6.2 U	2.5 U	1100	980	990	480	440	440	430	120	230	31 J	100 U	25 U	25 U	2.5 U	2.5 U	2.5 U
Total CBTEX	6.2 U	2.5 U	1700 J	1600 J	1600 J	790 J	792	800	780	380	630	321	270	310	25 U	9.6	2.2	2.2
Total CVOC	328	85.4	250 UJ	1.0 U	1.0 U	500 UJ	100 UJ	25 UJ	20 UJ	25 U	25 U	25 U	40 U	4.0 J	25 UJ	5 UJ	1.0 UJ	1.0 UJ
Total VOC	346	93.1	7,143 J	1591.52	1592.75	6300 J	4731 J	6831	4655	5200	4700 J	4995	5435	5774	50 U	35.9 J	7	7

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-27S	MW-27S	MW-27S	MW-27S	MW-27S	MW-28S	MW-28S	MW-28S	MW-28S	MW-29S	MW-29S	MW-29S	MW-29S	MW-29S	MW-30S	MW-30S	MW-30S
Sample Depth (feet bgs)	10-20	10-20	10-20	10-20	10-20	7-17	7-17	7-17	7-17	4-14	4-14	4-14	4-14	4-14	10-16	10-16	10-16
Sample Date	9/16/2019	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	3/16/2017	10/19/2017	9/17/2019	11/2/2016	10/18/2017	10/18/2017	9/18/2019	9/18/2019	11/3/2016	10/18/2017	11/14/2018
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,1,2,2-Tetrachloroethane	0.50 U	0.50 UJ	0.5 UJ	0.5 U	0.50 U	1.0 U	1.2 U	0.50 UJ	0.50 U	10 U	2.5 UJ	5.0 UJ	5.0 U	5.0 U	50 U	25 U	50 UJ
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.0 U	3.8 UJ	1.5 UJ	1.5 U	10 U	7.5 UJ	15 UJ	15 U	15 U	150 U	75 UJ	150 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,1-Dichloroethene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 UJ	2.5 U	--	12 UJ	25 UJ	25 U	25 U	250 U	120 U	250 U
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2,4-Trimethylbenzene	0.98 J	2.5 U	2.5 U	2.5 U	2.5 U	--	130	2.5 U	2.0 J	--	13	13 J	120	120	750	150	900
1,2-Dibromo-3-Chloropropane	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	6.2 U	2.5 UJ	2.5 U	--	12 UJ	25 UJ	25 U	25 U	250 U	120 UJ	250 UJ
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2.0 U	2 U	2 U	2.0 U	--	5.0 U	2.0 U	2.0 U	--	10 U	20 U	20 U	20 U	200 U	100 U	200 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2-Dichloroethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 UJ	50 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,2-Dichloropropane	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	10 U	5.0 U	10 U	10 U	10 U	100 U	50 U	100 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	5.3 J	2.5 U	2.5 U	--	12 U	25 U	16 J	15 J	160 J	120 U	180 J
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	6.2 U	2.5 U	2.5 U	50 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 UJ	2.5 U	--	12 UJ	25 UJ	25 U	25 U	250 U	120 UJ	250 U
1,3-Dichloropropene, cis-	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
1,3-Dichloropropene, Total	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	--	1.2 U	0.50 U	0.50 U	--	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
1,3-Dichloropropene, trans-	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 U	250 U	--	620 U	250 U	250 U	--	1200 U	2500 U	2500 U	2500 U	25000 UJ	12000 U	25000 UJ
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 UJ	2.5 U	--	12 UJ	25 UJ	25 U	25 U	250 U	120 UJ	250 U
2-Hexanone	5.0 U	5.0 U	5 U	5 U	5.0 U	10 U	12 UJ	5.0 UJ	5.0 U	100 U	25 UJ	50 UJ	50 U	50 U	500 UJ	250 UJ	500 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 UJ	2.5 U	--	12 UJ	25 UJ	25 U	25 U	250 U	120 UJ	250 U
Acetone	5.0 U	5.0 U	5 UJ	5 U	5.0 U	10 U	12 UJ	5.0 UJ	5.0 U	100 U	25 UJ	50 UJ	50 U	50 U	500 U	250 UJ	500 U
Benzene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	25	21	21	19	19	50 U	25 U	50 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Bromodichloromethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
Bromoform	2.0 U	2.0 U	2 U	2 U	2.0 U	1.0 UJ	5.0 U	2.0 U	2.0 U	10 UJ	10 U	20 U	20 U	20 U	200 U	100 U	200 U
Bromomethane	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	1.0 U	6.2 UJ	2.5 UJ	2.5 UJ	10 U	12 UJ	25 UJ	25 UJ	25 UJ	250 U	120 UJ	250 U
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Carbon Disulfide	5.0 U	5.0 U	5 U	5 U	5.0 U	1.0 U	12 UJ	5.0 U	5.0 U	10 U	25 U	50 U	50 U	50 U	500 U	250 U	500 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-27S	MW-27S	MW-27S	MW-27S	MW-27S	MW-28S	MW-28S	MW-28S	MW-28S	MW-29S	MW-29S	MW-29S	MW-29S	MW-29S	MW-30S	MW-30S	MW-30S
Sample Depth (feet bgs)	10-20	10-20	10-20	10-20	10-20	7-17	7-17	7-17	7-17	4-14	4-14	4-14	4-14	4-14	10-16	10-16	10-16
Sample Date	9/16/2019	11/5/2019	10/28/2020	10/5/2021	10/4/2022	11/2/2016	3/16/2017	10/19/2017	9/17/2019	11/2/2016	10/18/2017	10/18/2017	9/18/2019	9/18/2019	11/3/2016	10/18/2017	11/14/2018
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N
Analyte																	
Carbon Tetrachloride	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 UJ	2.5 UJ	2.5 U	10 U	12 UJ	25 UJ	25 U	25 U	250 UJ	120 UJ	250 U
Chloroethane	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	1.0 U	6.2 UJ	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 UJ	120 U	250 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Chloromethane	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	1.0 UJ	6.2 U	2.5 UJ	2.5 U	10 UJ	12 UJ	25 UJ	25 U	25 U	250 U	120 UJ	250 UJ
Dibromochloromethane	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
Dibromomethane (Methylene Bromide)	5.0 U	5.0 U	5 U	5 U	5.0 U	--	12 UJ	5.0 UJ	5.0 U	--	25 UJ	50 UJ	50 U	50 U	500 UJ	250 UJ	500 U
Dichlorodifluoromethane	5.0 U	5.0 UJ	5 U	5 U	5.0 U	--	12 U	5.0 UJ	5.0 U	--	25 UJ	50 UJ	50 U	50 U	500 U	250 UJ	500 U
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	22	11	2.5 U	2.5 U	3200	1500	2000	2000	2200	7300	2100	7600
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Isopropylbenzene (Cumene)	1.2 J	2.5 U	2.5 U	2.5 U	2.5 U	32	36	2.5 U	3.3	62	160	160	170	170	200 J	41 J	200 J
Methyl Ethyl Ketone (2-Butanone)	5.0 U	5.0 U	5 UJ	5 U	5.0 U	10 U	12 UJ	5.0 UJ	5.0 U	100 U	25 UJ	50 UJ	50 U	50 U	500 UJ	250 UJ	500 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 U	5.0 U	5 U	5 U	5.0 U	10 U	12 U	5.0 UJ	5.0 U	100 U	25 UJ	50 UJ	50 U	50 U	500 U	250 UJ	500 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Naphthalene	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	--	24 J	1.6 J	2.5 U	--	22	21 J	83	90	400	91 J	730
n-Propylbenzene	0.71 J	2.5 U	2.5 U	2.5 U	2.5 U	--	38	2.5 UJ	2.0 J	--	58 J	59 J	68	68	130 J	120 U	140 J
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	--	6.2 U	2.5 U	2.5 U	--	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Tetrachloroethene	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	1.3 J	2.5 U	5.0 U	5.0 U	5.0 U	50 U	25 U	50 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.25 J	6.2 U	2.5 U	2.5 U	250	7.6 J	11 J	25 U	25 U	250 U	120 U	250 U
Trichloroethene	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 U	1.0 U	1.2 U	0.50 U	0.50 U	10 U	1.2 J	2.1 J	5.0 U	5.0 U	50 U	25 U	50 U
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	10 U	12 U	25 U	25 U	25 U	250 U	120 U	250 U
Vinyl Acetate	5.0 U	5.0 UJ	5 U	5 U	5.0 U	--	12 U	5.0 U	5.0 U	--	25 U	50 U	50 U	50 U	500 U	250 U	500 U
Vinyl Chloride	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	10 U	5.0 U	10 U	10 U	10 U	100 U	50 UJ	100 U
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	13	6.2 U	2.5 U	2.5 U	6800	930	1300	2700	2600	26000	6900	24000
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.0 U	6.2 U	2.5 U	2.5 U	1800	300	380	130	130	77 J	51 J	120 J
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	13	6.2 U	2.5 U	2.5 U	8600	1200	1700	2800	2700	26000 J	7000 J	24000 J
Total CBTEX	1.2 J	2.5 U	2.5 U	2.5 U	2.5 U	67 J	47	2.5 U	3.3	12000	2918.6 J	3872 J	5000	5100	34000 J	9092 J	31800
Total CVOC	5.0 U	5.0 UJ	1 U	1 U	1.0 U	1.0 U	12 UJ	5 UJ	5.0 U	1.3 J	1.2 J	2.1 J	50 U	50 U	250 UJ	250 UJ	100 U
Total VOC	2.9 J	250 UJ	5 U	5 U	5.0 U	67.25	244.3 J	1.6 J	7.3 J	12138.3	3012.8 J	3967.1 J	5300 J	5400 J	35017	9333 J	33870

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-30S	MW-30S	MW-30S	MW-30S	MW-30S	MW-30S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S
Sample Depth (feet bgs)	10-16	10-16	10-16	10-16	10-16	10-16	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18
Sample Date	9/17/2019	11/6/2019	10/29/2020	10/6/2021	10/6/2021	10/5/2022	11/2/2016	3/14/2017	3/14/2017	10/19/2017	11/14/2018	11/6/2019	11/6/2019	10/28/2020	10/28/2020	10/7/2021	10/7/2021
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N	N	FD	N	N	N	FD	N	FD	N	FD
Analyte																	
1,1,1,2-Tetrachloroethane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,1,1-Trichloroethane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,1,2,2-Tetrachloroethane	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 UJ	0.50 UJ	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
1,1,2-Trichloroethane	3.8 U	75 U	1.5 U	15 U	7.5 U	38 U	15 U	3.8 UJ	1.5 UJ	7.5 UJ	1.5 U	3.0 U	3.0 U	38 U	30 U	15 U	7.5 U
1,1-Dichloroethane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,1-Dichloroethene	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	2.3 J	0.56 J	0.62	1.4 J	0.18 J	0.88 J	0.71 J	8 J	5.5 J	2.3 J	1.8 J
1,1-Dichloropropene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,2,3-Trichlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 UJ	50 U	25 U	12 U
1,2,3-Trichloropropane	6.2 U	120 UJ	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 UJ	2.5 U	5.0 UJ	5.0 UJ	62 U	50 U	25 U	12 U
1,2,4-Trichlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,2,4-Trimethylbenzene	120	410	2.5 U	58	33	980	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,2-Dibromo-3-Chloropropane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 UJ	2.5 UJ	5.0 U	5.0 U	62 UJ	50 U	25 U	12 U
1,2-Dibromoethane (Ethylene Dibromide)	5.0 U	100 U	2 U	20 U	10 U	50 U	20 U	5.0 U	2.0 U	10 U	2.0 U	4.0 U	4.0 U	50 U	40 U	20 U	10 U
1,2-Dichlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,2-Dichloroethane	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
1,2-Dichloroethene, cis-	6.2 U	120 U	1.1 J	25 U	12 U	62 U	240	67	71	240	26	180	160	1900	1700	800	630
1,2-Dichloroethene, Total	6.2 U	120 U	1.1 J	25 U	12 U	62 U	240	67	71	240	26	180	160	1900	1700	800	630
1,2-Dichloroethene, trans-	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,2-Dichloropropane	2.5 U	50 U	1 U	10 U	5 U	25 U	10 U	2.5 U	1.0 U	5.0 U	1.0 U	2.0 U	2.0 U	25 U	20 U	10 U	5 U
1,3,5-Trimethylbenzene (Mesitylene)	8.5	84 J	2.5 U	11 J	5.7 J	230	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,3-Dichlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,3-Dichloropropane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 UJ	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,3-Dichloropropene, cis-	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
1,3-Dichloropropene, Total	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
1,3-Dichloropropene, trans-	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
1,4-Dichlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
1,4-Dioxane (p-Dioxane)	620 U	12000 U	250 U	2500 U	1200 U	6200 UJ	2500 UJ	620 U	250 U	1200 U	250 UJ	500 U	500 U	6200 U	5000 U	2500 U	1200 U
2,2-Dichloropropane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
2-Chlorotoluene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 UJ	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
2-Hexanone	12 U	250 U	5 U	50 U	25 U	120 U	50 U	12 UJ	5.0 U	25 UJ	5.0 U	10 U	10 U	120 U	100 U	50 U	25 U
4-Chlorotoluene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 UJ	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Acetone	12 U	250 U	5 U	50 U	25 U	120 U	50 U	12 UJ	5.0 UJ	25 UJ	5.0 U	3.4 J	2.9 J	120 U	100 U	50 U	25 U
Benzene	3.6	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
Bromobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Bromodichloromethane	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
Bromoform	5.0 U	100 U	2 U	20 U	10 U	50 U	20 U	5.0 U	2.0 U	10 U	2.0 U	4.0 U	4.0 U	50 U	40 U	20 U	10 U
Bromomethane	6.2 UJ	120 UJ	2.5 UJ	25 U	12 U	62 UJ	25 U	6.2 UJ	2.5 UJ	12 UJ	2.5 U	5.0 UJ	5.0 UJ	62 UJ	50 UJ	25 U	12 U
Butylbenzene, n-	2.3 J	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Butylbenzene, sec-	3.4 J	120 U	1.9 J	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Butylbenzene, t-	6.2 U	120 U	1.5 J	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Carbon Disulfide	12 U	250 U	5 U	50 U	25 U	120 U	50 U	12 UJ	5.0 UJ	25 U	5.0 U	10 U	10 U	120 U	100 U	50 U	25 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-30S	MW-30S	MW-30S	MW-30S	MW-30S	MW-30S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S	MW-101S
Sample Depth (feet bgs)	10-16	10-16	10-16	10-16	10-16	10-16	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18	8-18
Sample Date	9/17/2019	11/6/2019	10/29/2020	10/6/2021	10/6/2021	10/5/2022	11/2/2016	3/14/2017	3/14/2017	10/19/2017	11/14/2018	11/6/2019	11/6/2019	10/28/2020	10/28/2020	10/7/2021	10/7/2021
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N	N	FD	N	N	N	FD	N	FD	N	FD
Analyte																	
Carbon Tetrachloride	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
Chlorobenzene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Chlorobromomethane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 UJ	6.2 UJ	2.5 UJ	12 UJ	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Chloroethane	6.2 U	120 U	2.5 UJ	25 U	12 U	62 U	25 UJ	6.2 UJ	2.5 UJ	12 U	2.5 U	5.0 U	5.0 U	62 UJ	50 UJ	25 U	12 U
Chloroform	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Chloromethane	6.2 U	120 UJ	2.5 U	25 U	12 U	62 UJ	25 U	6.2 U	2.5 U	12 UJ	2.5 UJ	5.0 UJ	5.0 UJ	62 U	50 U	25 U	12 U
Dibromochloromethane	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.50 U	2.5 U	0.50 U	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
Dibromomethane (Methylene Bromide)	12 U	250 U	5 U	50 U	25 U	120 U	50 U	12 UJ	5.0 UJ	25 UJ	5.0 U	10 U	10 U	120 U	100 U	50 U	25 U
Dichlorodifluoromethane	12 U	250 UJ	5 U	50 U	25 U	120 U	50 U	12 U	5.0 U	25 UJ	5.0 U	10 UJ	10 UJ	120 U	100 U	50 U	25 U
Ethylbenzene	440	3800	2.6	1100	570	4000	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Hexachlorobutadiene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Isopropylbenzene (Cumene)	48	120	8.6	41	31	250	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Methyl Ethyl Ketone (2-Butanone)	12 U	250 U	5 U	50 U	25 U	120 U	50 UJ	12 UJ	5.0 UJ	25 UJ	5.0 U	10 U	10 U	120 U	100 U	50 U	25 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	12 U	250 U	5 U	50 U	25 U	120 U	50 U	12 U	5.0 U	25 UJ	5.0 U	10 U	10 U	120 U	100 U	50 U	25 U
Methyl tert-butyl Ether	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Methylene Chloride	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Naphthalene	77	240	2.5 UJ	30	20	680	25 U	6.2 UJ	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 UJ	50 UJ	25 U	12 U
n-Propylbenzene	29	73 J	3	23 J	18	170	25 U	6.2 U	2.5 U	12 UJ	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
p-Isopropyltoluene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Styrene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Tetrachloroethene	1.2 U	25 U	0.5 U	5 U	2.5 U	12 U	5 U	1.2 U	0.19 J	2.5 U	0.27 J	1.0 U	1.0 U	12 U	10 U	5 U	2.5 U
Toluene	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Trichloroethene	1.2 U	25 U	1 J	3.7 J	2.1 J	12 U	620	170	180	510	75	310	270	3200 J	2800 J	1000	770
Trichlorofluoromethane	6.2 U	120 U	2.5 U	25 U	12 U	62 U	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Vinyl Acetate	12 U	250 UJ	5 U	50 U	25 U	120 U	50 U	12 U	5.0 U	25 U	5.0 U	10 UJ	10 UJ	120 U	100 U	50 U	25 U
Vinyl Chloride	2.5 U	50 U	1 U	10 U	5 U	25 U	3.2 J	0.75 J	0.84 J	2.3 J	0.20 J	1.2 J	1.0 J	17 J	15 J	6 J	4.8 J
Xylene, m- & p-	390	10000	4.4	2700	1400	11000	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Xylene, o-	18	100 J	1.8 J	35	20	120	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Xylenes, Total	410	10000 J	6.2	2700	1400	11000	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Total CBTEX	900	14000 J	17.4	3841	2001	15250	25 U	6.2 U	2.5 U	12 U	2.5 U	5.0 U	5.0 U	62 U	50 U	25 U	12 U
Total CVOC	2.5 U	50 U	2.1 J	3.7 J	2.1 J	25 U	870 J	238.31 J	252.65 J	753.7 J	101.65	490 J	430 J	5125 J	4520.5 J	1808.3	1406.6
Total VOC	1100 J	15000 J	27	4001.7	2099.8	17430	1105.5	238.31 J	252.65 J	753.7 J	127.65	500 J	430 J	6220.5	7025	2608.3	2036.6

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-101S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-103S	MW-103S	MW-103S	MW-103S	MW-103S	MW-104S	MW-104S	MW-104S	MW-104S
Sample Depth (feet bgs)	8-18	9-14	9-14	9-14	9-14	9-14	9-14	9-14	9-14	8-18	8-18	8-18	8-18	8-18	9-14	9-14	9-14	9-14
Sample Date	10/4/2022	11/2/2016	11/2/2016	3/14/2017	10/19/2017	10/19/2017	10/5/2021	10/4/2022	11/1/2016	3/14/2017	10/17/2017	10/5/2021	10/4/2022	11/1/2016	3/14/2017	10/18/2017	11/14/2018	
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,1,1-Trichloroethane	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,1,2,2-Tetrachloroethane	2.5 U	0.5 U	0.5 U	1.2 U	0.50 UJ	0.50 UJ	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 UJ	
1,1,2-Trichloroethane	7.5 U	1.5 U	1.5 U	3.8 UJ	1.5 UJ	1.5 UJ	3 U	1.5 U	1.5 U	1.5 UJ	3.0 UJ	15 U	3.0 U	1.5 U	3.0 UJ	1.5 UJ	1.5 U	
1,1-Dichloroethane	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,1-Dichloroethene	1.4 J	0.58	0.6	2.7	0.24 J	0.22 J	0.61 J	0.50 U	0.5 U	0.50 U	0.44 J	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
1,1-Dichloropropene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2,3-Trichlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2,3-Trichloropropane	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2,4-Trichlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2,4-Trimethylbenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2-Dibromo-3-Chloropropane	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 UJ	25 U	5.0 U	2.5 U	5.0 U	2.5 UJ	2.5 UJ	
1,2-Dibromoethane (Ethylene Dibromide)	10 U	2 U	2 U	5.0 U	2.0 U	2.0 U	4 U	2.0 U	2 U	2.0 U	4.0 U	20 U	4.0 U	2 U	4.0 U	2.0 U	2.0 U	
1,2-Dichlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2-Dichloroethane	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 UJ	0.50 U	
1,2-Dichloroethene, cis-	550	85	87	470	44	45	150	42	15	10	70	80	13	4.8	5.0 U	1.0 J	2.5 U	
1,2-Dichloroethene, Total	550	85	87	470	44	45	150	42	15	10	70	80	13	4.8	5.0 U	1.0 J	2.5 U	
1,2-Dichloroethene, trans-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,2-Dichloropropane	5.0 U	1 U	1 U	2.5 U	1.0 U	1.0 U	2 U	1.0 U	1 U	1.0 U	2.0 U	10 U	2.0 U	1 U	2.0 U	1.0 U	1.0 U	
1,3,5-Trimethylbenzene (Mesitylene)	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,3-Dichlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,3-Dichloropropane	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 UJ	25 U	5.0 U	2.5 U	5.0 U	2.5 UJ	2.5 U	
1,3-Dichloropropene, cis-	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
1,3-Dichloropropene, Total	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
1,3-Dichloropropene, trans-	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
1,4-Dichlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
1,4-Dioxane (p-Dioxane)	1200 U	250 UJ	250 UJ	620 U	250 U	250 U	500 U	250 U	250 UJ	250 U	500 UJ	2500 U	500 U	250 UJ	500 U	250 U	250 UJ	
2,2-Dichloropropane	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
2-Chlorotoluene	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 UJ	2.5 U	
2-Hexanone	25 U	5 UJ	5 UJ	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 U	5 U	5.0 U	10 UJ	50 U	10 U	5 UJ	10 UJ	5.0 UJ	5.0 U	
4-Chlorotoluene	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 UJ	25 U	5.0 U	2.5 U	5.0 U	2.5 UJ	2.5 U	
Acetone	25 U	5 U	5 U	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 U	5 U	5.0 UJ	10 U	50 U	10 U	5 U	10 UJ	5.0 UJ	5.0 U	
Benzene	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.28 J	1.0 U	0.50 U	0.50 U	
Bromobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Bromodichloromethane	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
Bromoform	10 U	2 U	2 U	5.0 U	2.0 U	2.0 U	4 U	2.0 U	2 U	2.0 U	4.0 U	20 U	4.0 U	2 U	4.0 U	2.0 U	2.0 U	
Bromomethane	12 U	2.5 U	2.5 U	6.2 UJ	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 UJ	5.0 UJ	25 U	5.0 U	2.5 UJ	5.0 UJ	2.5 UJ	2.5 U	
Butylbenzene, n-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Butylbenzene, sec-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Butylbenzene, t-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Carbon Disulfide	25 U	5 U	5 U	12 UJ	5.0 U	5.0 U	10 U	5.0 U	5 U	5.0 UJ	10 U	50 U	10 U	5 U	10 UJ	5.0 U	5.0 U	

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-101S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-102S	MW-103S	MW-103S	MW-103S	MW-103S	MW-103S	MW-104S	MW-104S	MW-104S	MW-104S
Sample Depth (feet bgs)	8-18	9-14	9-14	9-14	9-14	9-14	9-14	9-14	9-14	8-18	8-18	8-18	8-18	8-18	9-14	9-14	9-14	9-14
Sample Date	10/4/2022	11/2/2016	11/2/2016	3/14/2017	10/19/2017	10/19/2017	10/5/2021	10/4/2022	11/1/2016	3/14/2017	10/17/2017	10/5/2021	10/4/2022	11/1/2016	3/14/2017	10/18/2017	11/14/2018	
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																		
Carbon Tetrachloride	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
Chlorobenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Chlorobromomethane	12 U	2.5 UJ	2.5 UJ	6.2 UJ	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 UJ	2.5 UJ	5.0 UJ	25 U	5.0 U	2.5 UJ	5.0 UJ	2.5 UJ	2.5 U	
Chloroethane	12 U	2.5 UJ	2.5 UJ	6.2 UJ	2.5 U	2.5 U	5 U	2.5 U	2.5 UJ	2.5 UJ	5.0 U	25 U	5.0 U	2.5 UJ	5.0 UJ	2.5 U	2.5 U	
Chloroform	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Chloromethane	12 UJ	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 UJ	2.5 U	2.5 U	5.0 UJ	25 U	5.0 UJ	2.5 U	5.0 U	2.5 UJ	2.5 UJ	
Dibromochloromethane	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.5 U	1.0 U	0.50 U	0.50 U	
Dibromomethane (Methylene Bromide)	25 U	5 U	5 U	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 U	5 U	5.0 UJ	10 UJ	50 U	10 U	5 UJ	10 UJ	5.0 UJ	5.0 U	
Dichlorodifluoromethane	25 U	5 U	5 U	12 U	5.0 UJ	5.0 UJ	10 U	5.0 U	5 U	5.0 U	10 UJ	50 U	10 U	5 U	10 U	5.0 UJ	5.0 U	
Ethylbenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Hexachlorobutadiene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Isopropylbenzene (Cumene)	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Methyl Ethyl Ketone (2-Butanone)	25 U	5 UJ	5 UJ	12 UJ	5.0 UJ	5.0 UJ	10 U	5.0 U	5 UJ	5.0 UJ	10 UJ	50 U	10 U	5 UJ	10 UJ	5.0 UJ	5.0 U	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	25 U	5 U	5 U	12 U	5.0 UJ	5.0 UJ	10 U	5.0 U	5 U	5.0 U	10 UJ	50 U	10 U	5 UJ	10 U	5.0 UJ	5.0 U	
Methyl tert-butyl Ether	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Methylene Chloride	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Naphthalene	12 U	2.5 U	2.5 U	6.2 UJ	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 UJ	2.5 U	2.5 U	
n-Propylbenzene	12 U	2.5 U	2.5 U	6.2 U	2.5 UJ	2.5 UJ	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
p-Isopropyltoluene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Styrene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Tetrachloroethene	2.5 U	0.5 U	0.5 U	1.2 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	1.0 U	5 U	1.0 U	0.37 J	1.0 U	0.50 U	0.26 J	
Toluene	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Trichloroethene	680	62	63	150	30	30	280	180	81	60	180	1500	330	240	93	130	100	
Trichlorofluoromethane	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Vinyl Acetate	25 U	5 U	5 U	12 U	5.0 U	5.0 U	10 U	5.0 U	5 U	5.0 U	10 U	50 U	10 U	5 U	10 U	5.0 U	5.0 U	
Vinyl Chloride	3.4 J	7.8	7.5	1.8 J	0.16 J	0.15 J	0.93 J	0.11 J	1 U	1.0 U	0.17 J	10 U	2.0 U	0.15 J	2.0 U	1.0 UJ	1.0 U	
Xylene, m- & p-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Xylene, o-	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Xylenes, Total	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5.0 U	25 U	5.0 U	2.5 U	5.0 U	2.5 U	2.5 U	
Total CBTEX	12 U	2.5 U	2.5 U	6.2 U	2.5 U	2.5 U	5 U	2.5 U	2.5 U	2.5 U	5 UJ	25 U	5.0 U	0.28 J	5 U	2.5 U	2.5 U	
Total CVOC	1234.8	160	160	624.5 J	74.4 J	75.37 J	431.54	222.11	96	70	250.61 J	1580	343	250 J	93	131 J	100.26	
Total VOC	1784.8	240.38	245.1	624.5 J	74.4 J	75.37 J	581.54	264.11	111	70	250.61 J	1660	356	250.4	93	131 J	100.26	

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-104S	MW-104S	MW-104S	MW-104S	MW-105S	MW-105S	MW-105S	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D
Sample Depth (feet bgs)	9-14	9-14	9-14	9-14	8-18	8-18	8-18	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34
Sample Date	11/6/2019	10/29/2020	10/6/2021	10/6/2022	11/1/2016	3/15/2017	10/17/2017	11/1/2016	11/1/2016	3/15/2017	3/15/2017	10/17/2017	3/20/2018	11/14/2018	11/14/2018	11/5/2019	10/29/2020
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	FD	N	FD	N	N	N	FD	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,1,2,2-Tetrachloroethane	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 UJ	25 UJ	25 UJ	25 U
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 UJ	7.5 U	7.5 U	75 UJ	60 UJ	1.5 UJ	75 U	150 U	75 U	75 U	75 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,1-Dichloroethene	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	9.5	8.5	11 J	7.9 J	3	28	56	56	38	18 J
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 UJ
1,2,3-Trichloropropane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 UJ
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,2-Dibromo-3-Chloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	12 U	12 U	120 U	100 U	2.5 UJ	120 UJ	250 UJ	120 UJ	120 U	120 UJ
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2 U	2 U	2.0 U	2 U	2.0 U	2.0 U	10 U	10 U	100 U	80 U	2.0 U	100 U	200 U	100 U	100 U	100 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,2-Dichloroethane	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 UJ	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	5	2.5 U	2.5 U	2.5 U	2300	1800	3000	2500	1600	5600	7900	7700	7100	8700
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	5	2.5 U	2.5 U	2.5 U	2300 J	1800 J	3000	2500	1600 J	5600	7900	7700 J	7100	8700
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 J	4.5 J	120 U	100 U	1.2 J	120 U	250 U	40 J	120 U	120 U
1,2-Dichloropropane	1.0 U	1 U	1 U	1.0 U	1 U	1.0 U	1.0 U	5 U	5 U	50 U	40 U	1.0 U	50 U	100 U	50 U	50 U	50 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	12 U	12 U	120 U	100 U	2.5 UJ	120 U	250 U	120 U	120 U	120 U
1,3-Dichloropropene, cis-	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
1,3-Dichloropropene, Total	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
1,3-Dichloropropene, trans-	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 U	250 UJ	250 U	250 U	1200 UJ	1200 UJ	12000 U	10000 U	250 UJ	12000 UJ	25000 UJ	12000 UJ	12000 U	12000 UJ
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	12 U	12 U	120 U	100 U	2.5 UJ	120 U	250 U	120 U	120 U	120 U
2-Hexanone	5.0 U	5 U	5 U	5.0 U	5 UJ	5.0 U	5.0 UJ	25 UJ	25 UJ	250 UJ	200 UJ	5.0 UJ	250 U	500 U	250 U	250 U	250 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	12 U	12 U	120 U	100 U	2.5 UJ	120 U	250 U	120 U	120 U	120 U
Acetone	2.5 J	5 U	5 U	5.0 U	5 U	5.0 UJ	5.0 UJ	25 U	25 U	250 UJ	200 UJ	5.0 UJ	250 U	500 U	250 U	250 U	250 UJ
Benzene	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	4.3	3.5	25 U	20 U	0.59	13 J	24 J	23 J	11 J	25 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Bromodichloromethane	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
Bromoform	2.0 U	2 U	2 U	2.0 U	2 U	2.0 U	2.0 U	10 U	10 U	100 U	80 U	2.0 U	100 U	200 U	100 U	100 U	100 U
Bromomethane	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	12 UJ	12 UJ	120 UJ	100 UJ	2.5 UJ	120 UJ	250 U	120 U	120 UJ	120 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Carbon Disulfide	5.0 U	5 U	5 U	5.0 U	5 U	5.0 UJ	5.0 U	25 U	25 U	250 UJ	200 UJ	5.0 U	250 U	500 U	250 U	250 U	250 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-104S	MW-104S	MW-104S	MW-104S	MW-105S	MW-105S	MW-105S	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D	MW-106D
Sample Depth (feet bgs)	9-14	9-14	9-14	9-14	8-18	8-18	8-18	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34	24-34
Sample Date	11/6/2019	10/29/2020	10/6/2021	10/6/2022	11/1/2016	3/15/2017	10/17/2017	11/1/2016	11/1/2016	3/15/2017	3/15/2017	10/17/2017	3/20/2018	11/14/2018	11/14/2018	11/5/2019	10/29/2020
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	FD	N	FD	N	N	N	FD	N	N
Analyte																	
Carbon Tetrachloride	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	12 UJ	12 UJ	120 UJ	100 UJ	2.5 UJ	120 U	250 U	120 U	120 U	120 U
Chloroethane	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	12 UJ	12 UJ	120 UJ	100 UJ	2.5 U	120 UJ	250 U	120 U	120 U	120 UJ
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Chloromethane	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	12 U	12 U	120 U	100 U	2.5 UJ	120 UJ	250 UJ	120 UJ	120 UJ	120 U
Dibromochloromethane	0.50 U	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
Dibromomethane (Methylene Bromide)	5.0 U	5 U	5 U	5.0 U	5 UJ	5.0 UJ	5.0 UJ	25 UJ	25 UJ	250 UJ	200 UJ	5.0 UJ	250 U	500 U	250 U	250 U	250 U
Dichlorodifluoromethane	5.0 UJ	5 U	5 U	5.0 U	5 U	5.0 U	5.0 UJ	25 U	25 U	250 U	200 U	5.0 UJ	250 U	500 U	250 U	250 UJ	250 U
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Methyl Ethyl Ketone (2-Butanone)	5.0 U	5 U	5 U	5.0 U	5 UJ	5.0 UJ	5.0 UJ	25 UJ	25 UJ	250 UJ	200 UJ	5.0 UJ	250 U	500 U	250 U	250 U	250 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 U	5 U	5 UJ	5.0 U	5 UJ	5.0 U	5.0 UJ	25 UJ	25 UJ	250 U	200 U	5.0 UJ	250 U	500 U	250 U	250 U	250 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Naphthalene	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 UJ	100 U	2.5 U	120 U	250 U	120 U	120 U	120 UJ
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Tetrachloroethene	0.32 J	0.24 J	0.41 J	0.50 U	0.24 J	0.50 U	0.20 J	2.5 U	2.5 U	25 U	20 U	0.50 U	25 U	50 U	25 U	25 U	25 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Trichloroethene	80	75 J	49	59	0.6	0.22 J	0.77	580	500	73	62	3.4	1400	5500	5400	120	110 J
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Vinyl Acetate	5.0 UJ	5 U	5 U	5.0 U	5 U	5.0 U	5.0 U	25 U	25 U	250 U	200 U	5.0 U	250 UJ	500 U	250 U	250 UJ	250 U
Vinyl Chloride	1.0 U	1 U	1 U	0.10 J	1 U	1.0 U	1.0 UJ	2800	2900	3000	2500	2300	390 J	290	270	740	2000
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	12 U	12 U	120 U	100 U	2.5 U	120 U	250 U	120 U	120 U	120 U
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	4.3	3.5	120 U	100 U	0.59	13	24	23	11 J	120 U
Total CVOC	80 J	75.24 J	49.41	64.1	0.84 J	0.22 J	0.97 J	5700 J	5200 J	6084 J	5069.9 J	3907.6 J	7418	13746	13466	8000	10828
Total VOC	83 J	75.24	49.41	69.1	0.84	0.22 J	0.97 J	7998.8	7016.5	6084 J	5069.9 J	3908.19 J	13031	21670	21189	8000 J	19528

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-106D	MW-106D	MW-106S	MW-106S	MW-106S	MW-107S	MW-107S	MW-107S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S
Sample Depth (feet bgs)	24-34	24-34	10-15	10-15	10-15	9-19	9-19	9-19	7-17	7-17	7-17	7-17	7-17	7-17	7-17	7-17	7-17
Sample Date	10/6/2021	10/5/2022	11/1/2016	3/15/2017	10/17/2017	11/1/2016	3/15/2017	10/19/2017	11/1/2016	3/15/2017	3/15/2017	10/19/2017	10/19/2017	3/19/2018	11/14/2018	11/14/2018	11/5/2019
Shallow or Deep WBZ	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N	FD
Analyte																	
1,1,1,2-Tetrachloroethane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	50 U	20 UJ	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	150 U	60 U	1.5 U	1.5 UJ	1.5 UJ	1.5 U	1.5 UJ	1.5 UJ	1.5 U	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	22 J	35	0.28 J	0.28 J	0.21 J	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	250 U	100 UJ	4	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	250 U	100 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	200 U	80 U	2 U	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethene, cis-	10000	6800	17	26	11	3.3	7.8	2.5 U	7.6	3.2	3.4	4.6	4.6	9.2	5.8	5.8	9.5
1,2-Dichloroethene, Total	10000	6800 J	17	26	11	3.3	7.8	2.5 U	7.6	3.2	3.4	4.6	4.6	9.2	5.8	5.8	9.5
1,2-Dichloroethene, trans-	250 U	36 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	100 U	40 U	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene (Mesitylene)	250 U	100 UJ	2.2 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	250 U	100 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropene, cis-	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, Total	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropene, trans-	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	25000 U	10000 U	250 UJ	250 U	250 U	250 UJ	250 U	250 U	250 UJ	250 U	250 U	250 U	250 U	250 UJ	--	--	250 U
2,2-Dichloropropane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	250 U	100 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	500 U	200 U	5 UJ	5.0 U	5.0 UJ	5 UJ	5.0 U	5.0 UJ	5 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	250 U	100 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
Acetone	500 U	200 U	5 U	5.0 UJ	5.0 UJ	5 U	5.0 UJ	5.0 UJ	5 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	50 U	13 J	0.47 J	0.50 U	0.71	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	50 U	20 U	0.5 U	0.50 U	0.50 U	1.4	2.2	1.4	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	200 U	80 UJ	2 U	2.0 U	2.0 U	1.1 J	0.99 J	0.89 J	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Bromomethane	250 U	100 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ
Butylbenzene, n-	250 U	100 UJ	1.3 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	250 U	100 UJ	1.7 J	0.76 J	0.75 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	500 U	200 U	5 U	5.0 UJ	5.0 U	5 U	5.0 UJ	5.0 U	5 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-106D	MW-106D	MW-106S	MW-106S	MW-106S	MW-107S	MW-107S	MW-107S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S	MW-108S
Sample Depth (feet bgs)	24-34	24-34	10-15	10-15	10-15	9-19	9-19	9-19	7-17	7-17	7-17	7-17	7-17	7-17	7-17	7-17	7-17
Sample Date	10/6/2021	10/5/2022	11/1/2016	3/15/2017	10/17/2017	11/1/2016	3/15/2017	10/19/2017	11/1/2016	3/15/2017	3/15/2017	10/19/2017	10/19/2017	3/19/2018	11/14/2018	11/14/2018	11/5/2019
Shallow or Deep WBZ	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N	FD
Analyte																	
Carbon Tetrachloride	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	250 U	100 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
Chloroethane	250 U	100 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U
Chloroform	250 U	100 U	2.5 U	2.5 U	2.5 U	1 J	1.8 J	1.1 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	250 U	100 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Dibromochloromethane	50 U	20 U	0.5 U	0.50 U	0.50 U	2	2.3	1.6	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane (Methylene Bromide)	500 U	200 U	5 UJ	5.0 UJ	5.0 UJ	5 UJ	5.0 UJ	5.0 UJ	5 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U
Dichlorodifluoromethane	500 U	200 U	5 U	5.0 UJ	5.0 UJ	5 U	5.0 U	5.0 UJ	5 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 UJ
Ethylbenzene	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	250 U	100 UJ	1.2 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	500 U	200 U	5 UJ	5.0 UJ	5.0 UJ	5 UJ	5.0 UJ	5.0 UJ	5 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	500 U	200 U	5 UJ	5.0 U	5.0 UJ	5 UJ	5.0 U	5.0 UJ	5 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U
Methyl tert-butyl Ether	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	250 U	100 U	0.79 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
n-Propylbenzene	250 U	100 UJ	4.2	1.7 J	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	250 U	100 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	50 U	20 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.50 U	0.29 J	0.29 J	0.30 J	0.48 J	0.48 J	0.26 J	0.31 J	0.33 J	0.40 J
Toluene	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	50 U	710	45	43	13	14	18	0.50 U	40	26	24	22	22	33	28	28	23
Trichlorofluoromethane	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	500 U	200 U	5 U	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ
Vinyl Chloride	1200	340	4.4	3.6	6.4	1 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Xylene, m- & p-	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylene, o-	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	250 U	100 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CBTEX	250 U	13	1.7 J	2.5 U	0.71	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CVOC	11222	7921	67 J	72.88 J	30.61 J	17	32.1 J	4.1 J	48 J	29.49 J	27.7 J	27.08 J	27.08 J	42.46	34.11	34.13	33 J
Total VOC	21222	14734	99.54	75.34 J	32.07 J	26.1	33.09 J	4.99 J	55.49	29.49 J	27.7 J	27.08 J	27.08 J	51.66	39.91	39.93	33 J

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-108S	MW-108S	MW-108S	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109S	MW-110D	MW-110D	MW-110D	MW-110D	MW-110D	MW-110D
Sample Depth (feet bgs)	7-17	7-17	7-17	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	7-12	28-38	28-38	28-38	28-38	28-38	28-38
Sample Date	10/28/2020	10/5/2021	10/5/2022	10/17/2017	3/19/2018	11/14/2018	11/5/2019	10/28/2020	10/5/2021	10/4/2022	3/16/2017	11/2/2016	3/14/2017	10/19/2017	3/20/2018	11/15/2018	11/5/2019	
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,1,2,2-Tetrachloroethane	0.5 UJ	0.5 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 UJ	0.5 UJ	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 UJ	500 U	500 UJ	500 UJ
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	750 U	3000 UJ	1500 UJ	1500 U	1500 U	1500 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,1-Dichloroethene	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	130 J	1000 U	500 U	500 U	170 J	500 U
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2,3-Trichlorobenzene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 U	2500 U	2500 U
1,2,4-Trichlorobenzene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2-Dibromo-3-Chloropropane	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 UJ	2500 UJ	2500 U
1,2-Dibromoethane (Ethylene Dibromide)	2 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	2.0 U	1000 U	4000 U	2000 U	2000 U	2000 U	2000 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2-Dichloroethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
1,2-Dichloroethene, cis-	6.4	7.3	16	0.99 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	27000	23000	30000	24000	26000	26000
1,2-Dichloroethene, Total	6.4	7.3	16	0.99 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	27000	23000	30000	24000	26000	26000
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,2-Dichloropropane	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	1.0 U	500 U	2000 U	1000 U	1000 U	1000 U	1000 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 U	2500 U	2500 U
1,3-Dichloropropene, cis-	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
1,3-Dichloropropene, Total	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
1,3-Dichloropropene, trans-	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 UJ	250 UJ	--	250 U	250 U	250 U	250 U	250 U	250 U	120000 UJ	500000 U	250000 U	250000 UJ	250000 UJ	250000 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 U	2500 U	2500 U
2-Hexanone	5 U	5 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	5.0 UJ	2500 U	10000 UJ	5000 UJ	5000 U	5000 U	5000 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 U	2500 U	2500 U
Acetone	5 UJ	5 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 UJ	5 U	5.0 U	5.0 UJ	5.0 UJ	2500 U	10000 UJ	5000 UJ	5000 U	5000 U	5000 U
Benzene	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Bromodichloromethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
Bromoform	2 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	2.0 U	1000 U	4000 U	2000 U	2000 U	2000 U	2000 U
Bromomethane	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	1200 U	5000 UJ	2500 UJ	2500 UJ	2500 U	2500 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Carbon Disulfide	5 U	5 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	5.0 UJ	2500 U	10000 UJ	5000 U	5000 U	5000 U	5000 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-108S	MW-108S	MW-108S	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109D	MW-109S	MW-110D	MW-110D	MW-110D	MW-110D	MW-110D	MW-110D
Sample Depth (feet bgs)	7-17	7-17	7-17	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	7-12	28-38	28-38	28-38	28-38	28-38
Sample Date	10/28/2020	10/5/2021	10/5/2022	10/17/2017	3/19/2018	11/14/2018	11/5/2019	10/28/2020	10/5/2021	10/4/2022	3/16/2017	11/2/2016	3/14/2017	10/19/2017	3/20/2018	11/15/2018	11/5/2019
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																	
Carbon Tetrachloride	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	1200 UJ	5000 UJ	2500 UJ	2500 U	2500 U	2500 U
Chloroethane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	1200 UJ	5000 UJ	2500 U	2500 UJ	2500 U	2500 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Chloromethane	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	1200 U	5000 U	2500 UJ	2500 UJ	2500 UJ	2500 UJ
Dibromochloromethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	250 U	1000 U	500 U	500 U	500 U	500 U
Dibromomethane (Methylene Bromide)	5 U	5 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	2500 UJ	10000 UJ	5000 UJ	5000 U	5000 U	5000 U
Dichlorodifluoromethane	5 U	5 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5.0 U	2500 U	10000 U	5000 UJ	5000 U	5000 U	5000 UJ
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Methyl Ethyl Ketone (2-Butanone)	5 UJ	5 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 UJ	5 U	5.0 U	5.0 UJ	2500 UJ	10000 UJ	5000 UJ	5000 U	5000 U	5000 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5 U	5 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	2500 U	10000 U	5000 UJ	5000 U	5000 U	5000 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Naphthalene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	1200 U	5000 UJ	2500 U	2500 U	2500 U	2500 U
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 UJ	2500 U	2500 U	2500 U
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Tetrachloroethene	0.38 J	0.5	0.27 J	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.26 J	250 U	1000 U	500 U	500 U	500 U	500 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Trichloroethene	17 J	150	200	0.40 J	0.50 U	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 UJ	0.50 U	64000	120000	78000	120000	140000	120000
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Vinyl Acetate	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5.0 U	2500 U	10000 U	5000 U	5000 UJ	5000 U	5000 UJ
Vinyl Chloride	1 U	1 U	1.0 U	0.15 J	1.0 UJ	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	600	430 J	500 J	350 J	440 J	390 J
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1200 U	5000 U	2500 U	2500 U	2500 U	2500 U
Total CVOC	23.78 J	157.8	216.27	1.54 J	1.0 UJ	1.0 U	1.0 U	1 U	1 U	1.0 U	0.26 J	92000 J	143430 J	108500 J	144350	166610	150000 J
Total VOC	30.18	165.1	232.27	1.54 J	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	0.26 J	118730	143430 J	108500 J	168350	192610	150000 J

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-110D	MW-110D	MW-110D	MW-111D	MW-111D	MW-111D	MW-112S	MW-112S	MW-112S	MW-112S	MW-112S	MW-112S	MW-113D	MW-113D	MW-114S	MW-114S	MW-114S	MW-115D
Sample Depth (feet bgs)	28-38	28-38	28-38	32-42	32-42	32-42	6-16	6-16	6-16	6-16	6-16	6-16	29-39	29-39	8-13	8-13	8-13	35-40
Sample Date	10/29/2020	10/5/2021	10/5/2022	11/3/2016	3/14/2017	10/18/2017	11/3/2016	11/3/2016	3/15/2017	10/18/2017	9/17/2019	11/3/2016	3/15/2017	11/3/2016	3/15/2017	10/18/2017	11/3/2016	
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U
1,1,2-Trichloroethane	380 U	600 U	600 U	1.5 U	1.5 UJ	1.5 UJ	15 U	15 U	1.5 UJ	1.5 UJ	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 UJ	1.5 UJ	1.5 UJ	1.5 U
1,1-Dichloroethane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	0.95 J	0.76 J	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	120	280	190 J	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U
1,1-Dichloropropene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	620 UJ	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	620 UJ	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	270	220	8.9	1.4 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	620 UJ	1000 U	1000 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	500 U	800 U	800 U	2 U	2.0 U	2.0 U	20 U	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2.0 U	2 U	2.0 U	2.0 U	2 U
1,2-Dichlorobenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	120 U	200 U	200 U	0.48 J	0.42 J	0.35 J	5 U	5 U	0.50 U	0.50 UJ	0.50 U	0.29 J	0.25 J	0.5 U	0.50 U	0.50 UJ	0.5 U	
1,2-Dichloroethene, cis-	27000	48000	36000	2.2 J	1.7 J	1.1 J	25 U	25 U	2.5 U	2.5 U	2.5 U	0.89 J	0.77 J	2.5 U	2.5 U	2.5 U	2.5 U	
1,2-Dichloroethene, Total	27000	48000	36000	2.2 J	1.7 J	1.1 J	25 U	25 U	2.5 U	2.5 U	2.5 U	0.89 J	0.77 J	2.5 U	2.5 U	2.5 U	2.5 U	
1,2-Dichloroethene, trans-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	250 U	400 U	400 U	1 U	1.0 U	1.0 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1.0 U	1 U	1.0 U	1.0 U	1 U
1,3,5-Trimethylbenzene (Mesitylene)	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	42	35	0.74 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U
1,3-Dichloropropene, cis-	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U
1,3-Dichloropropene, Total	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U
1,3-Dichloropropene, trans-	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U
1,4-Dichlorobenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	62000 UJ	100000 U	100000 U	250 UJ	250 U	250 U	2500 UJ	2500 UJ	250 U	250 U	250 U	250 UJ	250 U	250 UJ	250 UJ	250 UJ	250 U	250 UJ
2,2-Dichloropropane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U
2-Hexanone	1200 UJ	2000 U	2000 U	5 UJ	5.0 U	5.0 UJ	50 UJ	50 UJ	5.0 UJ	5.0 UJ	5.0 U	5 UJ	5.0 U	5 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5 UJ
4-Chlorotoluene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U
Acetone	360 J	2000 U	2000 U	5 U	5.0 UJ	5.0 UJ	50 U	50 U	5.0 UJ	5.0 UJ	5.0 U	5 U	5.0 UJ	5 U	5.0 UJ	5.0 UJ	5.0 UJ	5 U
Benzene	120 U	78 J	140 J	5.6	6	2	5 U	5 U	1.1	0.30 J	0.36 J	7.3	6.4	0.5 U	0.29 J	0.50 U	0.5 U	
Bromobenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U
Bromoform	500 U	800 U	800 U	2 U	2.0 U	2.0 U	20 U	20 U	2.0 U	2.0 U	2.0 U	2 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2 U
Bromomethane	620 UJ	1000 U	1000 U	2.5 U	2.5 UJ	2.5 UJ	25 U	25 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U
Butylbenzene, n-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	15 J	14 J	13	4.3	1.4 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.2 J	1.3 J	1.8 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	1200 U	2000 U	2000 U	5 U	5.0 UJ	5.0 U	50 U	50 U	5.0 UJ	5.0 U	5.0 U	5 U	5.0 UJ	5 U	5.0 UJ	5.0 U	5.0 U	5 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-110D	MW-110D	MW-110D	MW-111D	MW-111D	MW-111D	MW-112S	MW-112S	MW-112S	MW-112S	MW-112S	MW-112S	MW-113D	MW-113D	MW-114S	MW-114S	MW-114S	MW-115D
Sample Depth (feet bgs)	28-38	28-38	28-38	32-42	32-42	32-42	6-16	6-16	6-16	6-16	6-16	6-16	29-39	29-39	8-13	8-13	8-13	35-40
Sample Date	10/29/2020	10/5/2021	10/5/2022	11/3/2016	3/14/2017	10/18/2017	11/3/2016	11/3/2016	3/15/2017	10/18/2017	9/17/2019	11/3/2016	3/15/2017	11/3/2016	3/15/2017	10/18/2017	11/3/2016	
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Shallow	Shallow	Shallow	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Analyte																		
Carbon Tetrachloride	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.5 U	0.5 U
Chlorobenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	620 U	1000 U	1000 U	2.5 UJ	2.5 UJ	2.5 UJ	25 UJ	25 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Chloroethane	620 UJ	1000 U	1000 U	2.5 UJ	2.5 UJ	2.5 U	25 UJ	25 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ
Chloroform	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U
Dibromochloromethane	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U
Dibromomethane (Methylene Bromide)	1200 U	2000 U	2000 U	5 UJ	5.0 UJ	5.0 UJ	50 UJ	50 UJ	5.0 UJ	5.0 UJ	5.0 U	5 UJ	5.0 UJ	5 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5 UJ
Dichlorodifluoromethane	1200 U	2000 U	2000 U	5 U	5.0 U	5.0 UJ	50 U	50 U	5.0 U	5.0 UJ	5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 UJ	5.0 UJ	5 U
Ethylbenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	1100	940	28	2.5 U	2.5 U	0.96 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	120	110	29	12	1.6 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	1200 U	2000 U	2000 U	5 UJ	5.0 UJ	5.0 UJ	50 UJ	50 UJ	5.0 UJ	5.0 UJ	5.0 U	5 UJ	5.0 UJ	5 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1200 U	2000 U	2000 U	5 U	5.0 U	5.0 UJ	50 U	50 U	5.0 U	5.0 UJ	5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 UJ	5.0 UJ	5 U
Methyl tert-butyl Ether	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	620 UJ	1000 U	1000 U	2.5 U	2.5 U	2.5 U	220	200	8.6 J	1.9 J	2.4 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
n-Propylbenzene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	72	62	4.4	2.5	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	7.8 J	7.4 J	1.3 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	120 U	200 U	200 U	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.3 J	0.24 J	0.32 J	0.5 U	0.5 U
Toluene	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	33000 J	36000	140000 J	0.5 U	0.50 U	0.50 U	5 U	5 U	0.50 U	0.65	0.45 J	0.5 U	0.50 U	0.5 U	0.23 J	0.50 U	0.5 U	0.5 U
Trichlorofluoromethane	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	1200 U	2000 U	2000 U	5 U	5.0 U	5.0 U	50 U	50 U	5.0 U	5.0 U	5.0 U	5 U	5.0 U	5 U	5.0 U	5.0 U	5.0 U	5 U
Vinyl Chloride	580	1100	580	10	11	7.1 J	10 U	10 U	1.0 U	1.0 UJ	0.12 J	3.6	3.4	1 U	1.0 U	1.0 UJ	1 U	1 U
Xylene, m- & p-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	1700	1400	12	2.5 U	2.5 U	3.4	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylene, o-	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	620 U	1000 U	1000 U	2.5 U	2.5 U	2.5 U	1700	1400	12	2.5 U	2.5 U	3.4	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CBTEX	620 U	78	140	5.6	6	2	2900	2500	70.1	12.3 J	2.0 J	12 J	6.4	2.5 U	0.29 J	2.5 U	2.5 U	2.5 U
Total CVOC	60700 J	85380	176770 J	13 J	13.12 J	8.55 J	25 UJ	25 UJ	5 UJ	0.65	0.57 J	5.7 J	5.18 J	0.30 J	0.47 J	0.32 J	1 U	1 U
Total VOC	88060	133458	212910	20.48	19.12 J	10.55 J	3546.8	2988.4	109.24 J	24.35 J	8.1 J	18.28	11.58 J	0.3	0.76 J	0.32 J	5 U	5 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-115D	MW-116S	MW-116S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-118D	MW-118D	MW-118D	MW-118D	MW-118D
Sample Depth (feet bgs)	35-40	8-13	8-13	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	24-34	24-34	24-34	24-34	24-34
Sample Date	3/15/2017	11/3/2016	3/15/2017	11/3/2016	3/15/2017	10/18/2017	11/13/2018	9/18/2019	11/6/2019	10/28/2020	10/6/2021	10/6/2022	10/17/2017	3/21/2018	3/21/2018	11/15/2018	11/6/2019	
Shallow or Deep WBZ	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Analyte																		
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,1,2,2-Tetrachloroethane	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 U	0.50 U	5.0 U	1000 U	500 U	1000 UJ	1000 UJ
1,1,2-Trichloroethane	1.5 UJ	1.5 U	1.5 UJ	15 U	15 UJ	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	15 UJ	3000 U	1500 U	3000 U	3000 U
1,1-Dichloroethane	2.5 U	1.2 J	1.0 J	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,1-Dichloroethene	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	320	1000 U	300 J	410 J	420 J
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2,4-Trimethylbenzene	2.5 U	12	1.3 J	80	22 J	1.9 J	2.5 U	3.3	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2-Dibromo-3-Chloropropane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 UJ	5000 UJ	2500 UJ	5000 UJ	5000 U
1,2-Dibromoethane (Ethylene Dibromide)	2.0 U	2 U	2.0 U	20 U	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	20 U	4000 U	2000 U	4000 U	4000 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,2-Dichloroethane	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	1.8 J	1000 U	500 U	1000 U	1000 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	180000	180000	180000	200000	240000
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	180000	180000	180000	200000	240000
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5000 U	5000 U	2500 U	5000 U	5000 U
1,2-Dichloropropane	1.0 U	1 U	1.0 U	10 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	10 U	2000 U	1000 U	2000 U	2000 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	4.6	2.5 U	18 J	25 U	2.5 U	2.5 U	0.90 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 UJ	5000 U	2500 U	5000 U	5000 U
1,3-Dichloropropene, cis-	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U
1,3-Dichloropropene, Total	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U
1,3-Dichloropropene, trans-	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
1,4-Dioxane (p-Dioxane)	250 U	250 UJ	250 U	2500 UJ	2500 U	250 U	--	250 U	250 U	250 U	250 U	250 U	250 U	2500 UJ	500000 UJ	250000 UJ	--	500000 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 UJ	5000 U	2500 U	5000 U	5000 U
2-Hexanone	5.0 U	5 U	5.0 U	50 UJ	50 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 UJ	5000 U	2500 U	5000 U	5000 U
Acetone	5.0 UJ	5 U	5.0 UJ	50 U	50 UJ	5.0 UJ	5.0 U	5.0 U	2.8 J	5 UJ	5 U	5.0 U	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 U
Benzene	0.50 U	0.7	0.43 J	6.6	11	0.64	0.50 U	0.43 J	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	44	1000 U	500 U	1000 U	1000 U
Bromobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
Bromodichloromethane	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U
Bromoform	2.0 U	2 U	2.0 U	20 U	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	20 U	4000 U	2000 U	4000 U	4000 U
Bromomethane	2.5 UJ	2.5 U	2.5 UJ	25 U	25 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	25 UJ	5000 UJ	2500 UJ	5000 U	5000 UJ
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	0.74 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	25 U	25 U	1.2 J	2.5 U	1.3 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U
Carbon Disulfide	5.0 UJ	5 U	5.0 UJ	50 U	50 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	50 U	10000 U	5000 U	10000 U	10000 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-115D	MW-116S	MW-116S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-117S	MW-118D	MW-118D	MW-118D	MW-118D	MW-118D
Sample Depth (feet bgs)	35-40	8-13	8-13	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	6-16	24-34	24-34	24-34	24-34	24-34
Sample Date	3/15/2017	11/3/2016	3/15/2017	11/3/2016	3/15/2017	10/18/2017	11/13/2018	9/18/2019	11/6/2019	10/28/2020	10/6/2021	10/6/2022	10/17/2017	3/21/2018	3/21/2018	11/15/2018	11/6/2019	
Shallow or Deep WBZ	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Analyte																		
Carbon Tetrachloride	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U	
Chlorobenzene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Chlorobromomethane	2.5 UJ	2.5 UJ	2.5 UJ	25 UJ	25 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 UJ	5000 U	2500 U	5000 U	5000 U	
Chloroethane	2.5 UJ	2.5 UJ	2.5 UJ	25 UJ	25 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	25 U	5000 UJ	2500 UJ	5000 U	5000 U	
Chloroform	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Chloromethane	2.5 U	2.5 U	2.5 U	25 U	25 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 UJ	5000 UJ	2500 UJ	5000 UJ	5000 UJ	
Dibromochloromethane	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	5.0 U	1000 U	500 U	1000 U	1000 U	
Dibromomethane (Methylene Bromide)	5.0 UJ	5 UJ	5.0 UJ	50 UJ	50 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 U	
Dichlorodifluoromethane	5.0 U	5 U	5.0 U	50 U	50 UJ	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 UJ	
Ethylbenzene	2.5 U	2.5 U	2.5 U	1200	710	51	2.5 U	20	2.5 U	2 J	0.71 J	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Isopropylbenzene (Cumene)	2.5 U	2.5	2.5 U	95	59	13	2.5 U	15	2.5 U	12	2.2 J	0.93 J	25 U	5000 U	2500 U	5000 U	5000 U	
Methyl Ethyl Ketone (2-Butanone)	5.0 UJ	5 UJ	5.0 UJ	50 UJ	50 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5 UJ	5 U	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 U	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5.0 U	5 U	5.0 U	50 U	50 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 UJ	5.0 U	50 UJ	10000 U	5000 U	10000 U	10000 U	
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Methylene Chloride	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Naphthalene	2.5 U	0.91 J	2.5 U	45	25 U	3.4	2.5 U	3.3	2.5 U	2.5 UJ	2.5 UJ	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
n-Propylbenzene	2.5 U	1.4 J	2.5 U	45	22 J	4.1 J	2.5 U	6.2	2.5 U	4.7	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Styrene	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Tetrachloroethene	0.50 U	0.5 U	0.50 U	5 U	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	10	1000 U	500 U	1000 U	1000 U	
Toluene	2.5 U	2.5 U	2.5 U	47	29	3	2.5 U	2.0 J	2.5 U	2.5 U	2.5 U	2.5 U	28	5000 U	2500 U	5000 U	5000 U	
Trichloroethene	0.50 U	0.18 J	0.50 U	5 U	5.0 U	0.51	0.50 U	0.50 U	0.50 U	0.5 UJ	2.5	0.50 U	54000	47000	47000	52000	63000	
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	25 U	25 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	5000 U	2500 U	5000 U	5000 U	
Vinyl Acetate	5.0 U	5 U	5.0 U	50 U	50 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	50 U	10000 UJ	5000 UJ	10000 U	10000 UJ	
Vinyl Chloride	1.0 U	0.56 J	0.37 J	10 U	10 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1 U	1 U	1.0 U	9500	5800 J	5900 J	8800	10000	
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	1700	460	57	2.5 U	120	2.5 U	10	2.5	2.5 U	11 J	5000 U	2500 U	5000 U	5000 U	
Xylene, o-	2.5 U	2.5 U	2.5 U	430	140	63	2.5 U	18	2.5 U	2.5 U	2.5 U	2.5 U	8.8 J	5000 U	2500 U	5000 U	5000 U	
Xylenes, Total	2.5 U	2.5 U	2.5 U	2100	600	120	2.5 U	140	2.5 U	10	2.5	2.5 U	20 J	5000 U	2500 U	5000 U	5000 U	
Total CBTEX	2.5 U	3.2	0.43 J	3500	1409	187.64	2.5 U	180 J	2.5 U	24	5.41	0.93	91.8 J	5000 U	2500 U	5000 U	5000 U	
Total CVOC	1.0 U	1.9 J	1.37 J	25 UJ	50 UJ	0.51	2.5 U	5.0 U	5.0 UJ	1 U	1 U	1.0 U	243831.8 J	232800	233200	261210	310000 J	
Total VOC	5.0 U	24.05	3.1 J	3666.6	1453 J	198.75 J	5.0 U	190 J	2.8 J	28.7	7.91	0.93	243923.6 J	412800	413200	461210	310000 J	

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-118D	MW-118D	MW-118D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-120D	MW-120D	MW-120D	MW-120D	MW-120D	MW-120D
Sample Depth (feet bgs)	24-34	24-34	24-34	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32	28-38	28-38	28-38	28-38	28-38	28-38
Sample Date	10/29/2020	10/6/2021	10/5/2022	10/16/2017	10/16/2017	3/20/2018	11/14/2018	11/7/2019	10/28/2020	10/6/2021	10/6/2022	10/16/2017	3/19/2018	11/15/2018	11/5/2019	11/5/2019	11/5/2019	10/28/2020
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD	N
Analyte																		
1,1,1,2-Tetrachloroethane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,1-Trichloroethane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1,2,2-Tetrachloroethane	1000 U	1200 U	250 U	20 U	20 U	20 U	25 UJ	20 U	20 UJ	25 U	10 U	0.50 U	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.5 U
1,1,2-Trichloroethane	3000 U	3800 U	750 U	60 UJ	60 UJ	60 U	75 U	60 U	60 U	75 U	30 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,1-Dichloroethane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	460 J	620 J	270	15 J	14 J	12 J	13 J	17 J	9.4 J	14 J	14	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
1,1-Dichloropropene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 UJ	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3-Trichloropropane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 UJ	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 UJ	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,4-Trimethylbenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromo-3-Chloropropane	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 UJ	120 UJ	100 U	100 UJ	120 U	50 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane (Ethylene Dibromide)	4000 U	5000 U	1000 U	80 U	80 U	80 U	100 U	80 U	80 U	100 U	40 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U
1,2-Dichlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
1,2-Dichloroethene, cis-	270000	290000	280000	4000	4000	5000	5400	6000	3600	4600	3900	0.90 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, Total	270000	290000	280000	4100	4100	5100 J	5500 J	6100	3700	4700	4000	0.90 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloroethene, trans-	5000 U	6200 U	1200 U	120	110	95 J	97 J	130	120	140	140	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dichloropropane	2000 U	2500 U	500 U	40 U	40 U	40 U	50 U	40 U	40 U	50 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U
1,3,5-Trimethylbenzene (Mesitylene)	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropane	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 U	120 U	100 U	100 U	120 U	50 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dichloropropene, cis-	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
1,3-Dichloropropene, Total	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
1,3-Dichloropropene, trans-	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
1,4-Dichlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,4-Dioxane (p-Dioxane)	500000 U	620000 U	120000 U	10000 U	10000 U	10000 UJ	12000 UJ	10000 U	10000 U	12000 U	5000 U	250 U	250 UJ	250 UJ	250 U	250 U	250 U	250 U
2,2-Dichloropropane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Chlorotoluene	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 U	120 U	100 U	100 U	120 U	50 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2-Hexanone	10000 U	12000 U	2500 U	200 UJ	200 UJ	200 U	250 U	200 U	200 U	250 U	100 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U
4-Chlorotoluene	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 U	120 U	100 U	100 U	120 U	50 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Acetone	10000 U	12000 U	2500 U	200 UJ	200 UJ	200 U	250 U	200 U	200 UJ	250 U	100 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Benzene	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Bromobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Bromodichloromethane	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Bromoform	4000 U	5000 U	1000 U	80 U	80 U	80 U	100 U	80 U	80 U	100 U	40 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U
Bromomethane	5000 UJ	6200 U	1200 U	100 UJ	100 UJ	100 UJ	120 U	100 UJ	100 UJ	120 U	50 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Butylbenzene, n-	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, sec-	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Butylbenzene, t-	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Carbon Disulfide	10000 U	12000 U	2500 U	200 U	200 U	200 U	250 U	200 U	200 U	250 U	100 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-118D	MW-118D	MW-118D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-119D	MW-120D	MW-120D	MW-120D	MW-120D	MW-120D	MW-120D
Sample Depth (feet bgs)	24-34	24-34	24-34	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32	22-32	28-38	28-38	28-38	28-38	28-38	28-38
Sample Date	10/29/2020	10/6/2021	10/5/2022	10/16/2017	10/16/2017	3/20/2018	11/14/2018	11/7/2019	10/28/2020	10/6/2021	10/6/2022	10/16/2017	3/19/2018	11/15/2018	11/5/2019	11/5/2019	11/5/2019	10/28/2020
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	FD	N
Analyte																		
Carbon Tetrachloride	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Chlorobenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chlorobromomethane	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 U	120 U	100 U	100 U	120 U	50 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloroethane	5000 UJ	6200 U	1200 U	100 U	100 U	100 UJ	120 U	100 U	100 UJ	120 U	50 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ
Chloroform	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Chloromethane	5000 U	6200 U	1200 U	100 UJ	100 UJ	100 UJ	120 UJ	100 UJ	100 U	120 U	50 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U
Dibromochloromethane	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Dibromomethane (Methylene Bromide)	10000 U	12000 U	2500 U	200 UJ	200 UJ	200 U	250 U	200 U	200 U	250 U	100 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Dichlorodifluoromethane	10000 U	12000 U	2500 U	200 UJ	200 UJ	200 U	250 U	200 UJ	200 U	250 U	100 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5 U
Ethylbenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Hexachlorobutadiene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Isopropylbenzene (Cumene)	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl Ethyl Ketone (2-Butanone)	10000 U	12000 U	2500 U	200 UJ	200 UJ	200 U	250 U	200 U	200 UJ	250 U	100 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	10000 U	12000 UJ	2500 U	200 UJ	200 UJ	200 U	250 U	200 U	200 U	250 UJ	100 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Methyl tert-butyl Ether	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methylene Chloride	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	5000 UJ	6200 UJ	1200 U	100 U	100 U	100 U	120 U	100 U	100 UJ	120 UJ	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ
n-Propylbenzene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
p-Isopropyltoluene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Styrene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	1000 U	1200 U	250 U	20 U	20 U	20 U	25 U	20 U	20 U	25 U	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U
Toluene	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	70000 J	120000	67000	370	360	320	400	420	320 J	320	280	0.7	0.56	0.50 U	0.50 U	0.50 U	0.50 U	0.5 UJ
Trichlorofluoromethane	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl Acetate	10000 U	12000 U	2500 U	200 U	200 U	200 UJ	250 U	200 UJ	200 U	250 U	100 U	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5 U
Vinyl Chloride	15000	20000	7700 J	180	180	340 J	370	440	280	320	270 J	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1 U
Xylene, m- & p-	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylene, o-	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Xylenes, Total	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CBTEX	5000 U	6200 U	1200 U	100 U	100 U	100 U	120 U	100 U	100 U	120 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total CVOC	355460	430620	354970	4685 J	4664 J	5767	6280	7000 J	4329.4	5394	4604	1.6 J	0.56	1.0 U	1.0 U	1.0 U	1.0 U	1 U
Total VOC	625460	720620	634970	4685 J	4664 J	10867	11780	7000 J	8029.4	10094	8604	1.6 J	0.56	5.0 U	5.0 U	5.0 U	5.0 U	5 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-120D	MW-120D	MW-120D	MW-120D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-122D	MW-122D	MW-122D	MW-122D	MW-122D	MW-122D
Sample Depth (feet bgs)	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	22-32	22-32	22-32	22-32	22-32	22-32
Sample Date	10/28/2020	10/5/2021	10/5/2022	10/5/2022	10/17/2017	3/19/2018	11/14/2018	11/6/2019	10/28/2020	10/5/2021	10/5/2022	10/17/2017	3/20/2018	11/13/2018	11/5/2019	10/28/2020	10/7/2021
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																	
1,1,1,2-Tetrachloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,1,1-Trichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.5 UJ	0.5 U	0.50 U	0.50 U	5.0 U	5.0 UJ	5.0 UJ	2.5 UJ	1.2 U
1,1,2-Trichloroethane	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UJ	15 U	15 U	15 U	7.5 U	3.8 U
1,1-Dichloroethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,1-Dichloroethene	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.58	5.0 U	5.0 U	5.0 U	1.6 J	2.1
1,1-Dichloropropene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,2,3-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 UJ	6.2 U
1,2,3-Trichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,2,4-Trichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 UJ	6.2 U
1,2,4-Trimethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,2-Dibromo-3-Chloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	25 UJ	25 UJ	25 U	12 UJ	6.2 U
1,2-Dibromoethane (Ethylene Dibromide)	2 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	20 U	20 U	20 U	10 U	5 U
1,2-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,2-Dichloroethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
1,2-Dichloroethene, cis-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	56	90	96	110	260	510
1,2-Dichloroethene, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	56	90	96	110	260	510 J
1,2-Dichloroethene, trans-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	3.4 J
1,2-Dichloropropane	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.0 U	1.0 U	10 U	10 U	10 U	5 U	2.5 U
1,3,5-Trimethylbenzene (Mesitylene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,3-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,3-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	25 U	12 U	6.2 U
1,3-Dichloropropene, cis-	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
1,3-Dichloropropene, Total	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
1,3-Dichloropropene, trans-	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
1,4-Dichlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
1,4-Dioxane (p-Dioxane)	250 U	250 U	250 U	250 U	250 U	250 UJ	250 UJ	250 U	250 U	250 U	250 U	250 UJ	2500 UJ	2500 UJ	2500 U	1200 U	620 U
2,2-Dichloropropane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
2-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	25 U	12 U	6.2 U
2-Hexanone	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	50 U	50 U	50 U	25 U	12 U
4-Chlorotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	25 U	12 U	6.2 U
Acetone	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	3.0 J	5 UJ	5 U	5.0 U	5.0 UJ	50 U	50 U	50 U	25 UJ	12 U
Benzene	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.21 J	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
Bromobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Bromodichloromethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
Bromoform	2 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	2.0 U	2.0 U	20 U	20 U	20 U	10 U	5 U
Bromomethane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	25 UJ	25 UJ	25 UJ	12 UJ	6.2 U
Butylbenzene, n-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Butylbenzene, sec-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Butylbenzene, t-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Carbon Disulfide	5 U	5 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	50 U	50 U	50 U	25 U	12 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-120D	MW-120D	MW-120D	MW-120D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-121D	MW-122D	MW-122D	MW-122D	MW-122D	MW-122D	MW-122D
Sample Depth (feet bgs)	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	28-38	22-32	22-32	22-32	22-32	22-32	22-32
Sample Date	10/28/2020	10/5/2021	10/5/2022	10/5/2022	10/17/2017	3/19/2018	11/14/2018	11/6/2019	10/28/2020	10/5/2021	10/5/2022	10/17/2017	3/20/2018	11/13/2018	11/5/2019	10/28/2020	10/7/2021
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Sample Type	FD	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																	
Carbon Tetrachloride	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
Chlorobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Chlorobromomethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	25 U	25 U	25 U	12 U	6.2 U
Chloroethane	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 UJ	25 U	25 U	12 UJ	6.2 U
Chloroform	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Chloromethane	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	2.5 UJ	25 UJ	25 UJ	25 UJ	12 U	6.2 U
Dibromochloromethane	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
Dibromomethane (Methylene Bromide)	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	50 U	50 U	50 U	25 U	12 U
Dichlorodifluoromethane	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5.0 UJ	50 U	50 U	50 UJ	25 U	12 U
Ethylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Hexachlorobutadiene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Isopropylbenzene (Cumene)	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Methyl Ethyl Ketone (2-Butanone)	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 UJ	5 U	5.0 U	5.0 UJ	50 U	50 U	50 U	25 UJ	12 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5 U	5 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 UJ	50 U	50 U	50 U	25 U	12 U
Methyl tert-butyl Ether	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Methylene Chloride	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Naphthalene	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 UJ	6.2 U
n-Propylbenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
p-Isopropyltoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Styrene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Tetrachloroethene	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	5.0 U	5.0 U	5.0 U	2.5 U	1.2 U
Toluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Trichloroethene	0.5 UJ	0.5 U	0.50 U	0.50 U	0.30 J	0.50 U	0.50 U	0.50 U	0.5 UJ	0.5 U	0.50 U	360	1100	990	880	660 J	440
Trichlorofluoromethane	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Vinyl Acetate	5 U	5 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5 U	5 U	5.0 U	5.0 U	50 UJ	50 U	50 UJ	25 U	12 U
Vinyl Chloride	1 U	1 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1 U	1 U	1.0 U	1.4	0.96 J	0.86 J	0.96 J	1 J	1.2 J
Xylene, m- & p-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Xylene, o-	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Xylenes, Total	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	25 U	25 U	25 U	12 U	6.2 U
Total CBTEX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.21 J	25 U	25 U	25 U	12 U	6.2 U
Total CVOC	1 U	1 U	1.0 U	1.0 U	0.3 J	1.0 UJ	1.0 U	1.0 U	1 U	1 U	1.0 U	417.98	1190.96	1086.86	990 J	922.6 J	956.7
Total VOC	5 U	5 U	5.0 U	5.0 U	0.3 J	5.0 U	5.0 U	5.0 U	5 U	5 U	5.0 U	418.19 J	1280.96	1182.86	990 J	1182.6	1466.7

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-122D	MW-122D	MW-122D	MW-123D	MW-123D	MW-123D	MW-123D	MW-124S
Sample Depth (feet bgs)	22-32	22-32	22-32	25-35	25-35	25-35	25-35	5-15
Sample Date	10/7/2021	10/5/2022	10/5/2022	10/19/2017	3/20/2018	3/20/2018	10/29/2020	9/17/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	FD	N	FD	N	N	FD	N	N
Analyte								
1,1,1,2-Tetrachloroethane	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
1,1,1-Trichloroethane	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
1,1,2,2-Tetrachloroethane	2 U	1.0 UJ	1.0 UJ	200 UJ	500 U	1000 U	500 U	1.2 U
1,1,2-Trichloroethane	6 U	3.0 U	3.0 U	600 UJ	1500 U	3000 U	1500 U	3.8 U
1,1-Dichloroethane	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
1,1-Dichloroethene	1.7 J	1.4	0.78 J	330	410 J	390 J	500 U	1.2 U
1,1-Dichloropropene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
1,2,3-Trichlorobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 UJ	6.2 U
1,2,3-Trichloropropane	10 U	5.0 U	5.0 U	1000 UJ	2500 U	5000 U	2500 U	6.2 U
1,2,4-Trichlorobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 UJ	6.2 U
1,2,4-Trimethylbenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	390
1,2-Dibromo-3-Chloropropane	10 U	5.0 UJ	5.0 UJ	1000 UJ	2500 UJ	5000 UJ	2500 UJ	6.2 U
1,2-Dibromoethane (Ethylene Dibromide)	8 U	4.0 U	4.0 U	800 U	2000 U	4000 U	2000 U	5.0 U
1,2-Dichlorobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
1,2-Dichloroethane	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
1,2-Dichloroethene, cis-	490	140	140	59000	87000	83000	58000	6.2 U
1,2-Dichloroethene, Total	490 J	140	140 J	59000	87000	83000	58000	6.2 U
1,2-Dichloroethene, trans-	3.2 J	5.0 U	1.4 J	1000 U	2500 U	5000 U	2500 U	6.2 U
1,2-Dichloropropane	4 U	2.0 U	2.0 U	400 U	1000 U	2000 U	1000 U	2.5 U
1,3,5-Trimethylbenzene (Mesitylene)	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
1,3-Dichlorobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
1,3-Dichloropropane	10 U	5.0 U	5.0 U	1000 UJ	2500 U	5000 U	2500 U	6.2 U
1,3-Dichloropropene, cis-	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
1,3-Dichloropropene, Total	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
1,3-Dichloropropene, trans-	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
1,4-Dichlorobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
1,4-Dioxane (p-Dioxane)	1000 U	500 U	500 U	100000 U	250000 UJ	500000 UJ	250000 UJ	620 U
2,2-Dichloropropane	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
2-Chlorotoluene	10 U	5.0 UJ	5.0 UJ	1000 UJ	2500 U	5000 U	2500 U	6.2 U
2-Hexanone	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 UJ	12 U
4-Chlorotoluene	10 U	5.0 UJ	5.0 UJ	1000 UJ	2500 U	5000 U	2500 U	6.2 U
Acetone	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 UJ	12 U
Benzene	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
Bromobenzene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
Bromodichloromethane	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
Bromoform	8 U	4.0 UJ	4.0 UJ	800 U	2000 U	4000 U	2000 U	5.0 U
Bromomethane	10 U	5.0 U	5.0 U	1000 UJ	2500 UJ	5000 UJ	2500 UJ	6.2 UJ
Butylbenzene, n-	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	3.0 J
Butylbenzene, sec-	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	5.1 J
Butylbenzene, t-	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	2.0 J
Carbon Disulfide	20 U	10 U	10 U	2000 U	5000 U	10000 U	5000 U	12 U

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-122D	MW-122D	MW-122D	MW-123D	MW-123D	MW-123D	MW-123D	MW-124S
Sample Depth (feet bgs)	22-32	22-32	22-32	25-35	25-35	25-35	25-35	5-15
Sample Date	10/7/2021	10/5/2022	10/5/2022	10/19/2017	3/20/2018	3/20/2018	10/29/2020	9/17/2019
Shallow or Deep WBZ	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow
Onsite/Offsite	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	FD	N	FD	N	N	FD	N	N
Analyte								
Carbon Tetrachloride	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
Chlorobenzene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Chlorobromomethane	10 U	5.0 U	5.0 U	1000 UJ	2500 U	5000 U	2500 U	6.2 U
Chloroethane	10 U	5.0 U	5.0 U	1000 U	2500 UJ	5000 UJ	2500 UJ	6.2 U
Chloroform	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Chloromethane	10 U	5.0 UJ	5.0 UJ	1000 UJ	2500 UJ	5000 UJ	2500 U	6.2 U
Dibromochloromethane	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
Dibromomethane (Methylene Bromide)	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 U	12 U
Dichlorodifluoromethane	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 U	12 U
Ethylbenzene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	5.0 J
Hexachlorobutadiene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	6.2 U
Isopropylbenzene (Cumene)	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	33
Methyl Ethyl Ketone (2-Butanone)	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 U	12 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	20 U	10 U	10 U	2000 UJ	5000 U	10000 U	5000 U	12 U
Methyl tert-butyl Ether	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Methylene Chloride	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Naphthalene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 UJ	60
n-Propylbenzene	10 U	5.0 UJ	5.0 UJ	1000 UJ	2500 U	5000 U	2500 U	76
p-Isopropyltoluene	10 U	5.0 UJ	5.0 UJ	1000 U	2500 U	5000 U	2500 U	2.0 J
Styrene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Tetrachloroethene	2 U	1.0 U	1.0 U	200 U	500 U	1000 U	500 U	1.2 U
Toluene	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Trichloroethene	570	490	500	160000	140000	140000	94000 J	1.2 U
Trichlorofluoromethane	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Vinyl Acetate	20 U	10 U	10 U	2000 U	5000 UJ	10000 UJ	5000 U	12 U
Vinyl Chloride	1.1 J	0.73 U	0.76 U	4400	6600 J	6400 J	4300	2.5 U
Xylene, m- & p-	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Xylene, o-	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Xylenes, Total	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	6.2 U
Total CBTEX	10 U	5.0 U	5.0 U	1000 U	2500 U	5000 U	2500 U	38 J
Total CVOC	1066	632.13	642.94	223730	234010	229790	156300	12 U
Total VOC	1556	772.13	782.94	223730	321010	312790	214300	580 J

Table 2-1a. Historical Groundwater Data: Volatile Organic Compounds
Essex-Hope Site, Jamestown, New York

Notes:
All results in µg/L
Bold indicates detection
µg/L = microgram(s) per liter
bgs = below ground surface
CBTEX = cument, benzene, toluene, ethylbenzene, and xylenes
CVOC = chlorinated volatile organic compounds
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected
VOC = volatile organic compounds
WBZ = water-bearing zone

Table 2-1b. Historical Groundwater Data: Total Metals*Essex-Hope Site, Jamestown, New York*

Location ID	MW-26S	MW-27S	MW-30S	MW-31S	MW-117S	MW-124S
Sample Date	9/18/2019	9/16/2019	9/17/2019	9/17/2019	9/18/2019	9/17/2019
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N
Analyte						
Iron	23.3	3.78	11.6	10.7	0.866	12.7
vz1	8.020	3.405	8.421	9.906	1.371	9.626

Notes:

All results in mg/L

Bold indicates detection

ID = Identifier

mg/L = milligram(s) per liter

N = normal sample

WBZ = water-bearing zone

Table 2-1c. Historical Groundwater Data: Dissolved Metals

Essex-Hope Site, Jamestown, New York

Location ID	HW-6	MW-1	MW-7D	MW-15D	MW-15D	MW-16D	MW-21D	MW-21D	MW-22D	MW-22D	MW-23D	MW-25S	MW-26S	MW-27S	MW-30S	MW-101S
Sample Date	3/16/2017	11/4/2016	11/4/2016	11/1/2016	10/29/2020	10/28/2020	3/14/2017	10/29/2020	11/3/2016	10/29/2020	11/2/2016	11/2/2016	11/2/2016	11/2/2016	11/3/2016	10/28/2020
Shallow or Deep WBZ	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-03	OU-03	OU-01	OU-03	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																
Iron, Dissolved	7.37	7.73	2.18	0.757	0.58	0.49	22.7	9.06	0.028 J	0.05 U	2.16	0.05 U	21.4	0.427	13.9	0.062 U
Manganese, Dissolved	7.113	3.456	0.2398	0.2009	0.1438	0.194	1.070	0.3512	2.165	3.602	0.1682	0.0008 J	9.22	0.9467	18.5	1.577

Notes:
All results in mg/L
Bold indicates detection
J = estimated detection
ID = Identifier
mg/L = milligram(s) per liter
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-1c. Historical Groundwater Data: Dissolved Metals

Essex-Hope Site, Jamestown, New York

Location ID	MW-104S	MW-106D	MW-106D	MW-106D	MW-106S	MW-107S	MW-110D	MW-112S	MW-112S	MW-115D	MW-116S	MW-118D	MW-123D
Sample Date	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/3/2016	11/3/2016	11/3/2016	11/3/2016	10/29/2020	10/29/2020
Shallow or Deep WBZ	Shallow	Deep	Deep	Deep	Shallow	Shallow	Deep	Shallow	Shallow	Deep	Shallow	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	FD	N	N	N	N	N	N	FD	N	N	N
Analyte													
Iron, Dissolved	0.05 U	0.428	0.41	0.907	0.154	0.05 U	1.08	21	19.9	0.334	10	9.45	2.14
Manganese, Dissolved	0.0031	0.2406	0.2441	0.1684	9.908 J	0.0206	0.2876	16.69	15.65	0.0914	0.8191	1.045	0.3459

Notes:
All results in mg/L
Bold indicates detection
J = estimated detection
ID = Identifier
mg/L = milligram(s) per liter
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-1d. Historical Groundwater Data: Perfluoroalkyl and Polyfluoroalkyl Substances

Essex-Hope Site, Jamestown, New York

Location ID	MW-19D	MW-19S	MW-112S	MW-113D	MW-113D	MW-115D	MW-116S
Sample Date	6/27/2018	6/27/2018	6/28/2018	6/28/2018	6/28/2018	6/27/2018	6/27/2018
Shallow or Deep WBZ	Deep	Shallow	Shallow	Deep	Deep	Deep	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N
Analyte							
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	0.180 U	0.307 U	3.83 J	0.739 U	0.676 U	0.438 U	0.452 U
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.269 U	0.260 U	0.280 U	0.260 U	0.251 U	0.251 U	0.269 U
n-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	0.345 U	0.333 U	0.358 U	0.333 U	0.321 U	0.321 U	0.345 U
n-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	0.232 U	0.224 U	0.241 U	0.224 U	0.745 J	0.216 U	0.232 U
Perfluorobutane sulfonic acid (PFBS)	0.102 U	0.604 J	0.981 J	0.628 J	0.772 J	0.095 U	0.652 J
Perfluorobutanoic acid (PFBA)	2.55	4.68	4.73	9.92	9.42	1.81	5.30
Perfluorodecane sulfonic acid (PFDS)	0.206 UJ	0.198 UJ	0.214 UJ	0.198 UJ	0.192 UJ	0.192 UJ	0.206 UJ
Perfluorodecanoic acid (PFDA)	0.176 U	2.26	3.02	0.170 U	0.164 U	0.164 U	0.176 U
Perfluorododecanoic acid (PFDoDA)	0.085 U	0.082 U	0.088 U	0.082 U	0.079 U	0.079 U	0.085 U
Perfluoroheptane sulfonate (PFHpS)	0.144 U	0.321 J	0.149 U	0.138 U	0.134 U	0.134 U	0.144 U
Perfluoroheptanoic acid (PFHpA)	0.086 U	2.59	5.19	8.90	8.60	0.080 U	3.62
Perfluorohexane sulfonic acid (PFHxS)	0.100 U	0.454 U	1.88 J	0.754 J	0.876 J	0.093 U	1.79 J
Perfluorohexanoic acid (PFHxA)	0.117 U	2.98	5.78	20.3	20.4	0.109 U	5.57
Perfluorononanoic acid (PFNA)	0.093 U	1.42 J	2.13	0.168 J	0.090 J	0.087 U	0.456 J
Perfluorooctane sulfonamide (FOSA)	0.210 U	0.202 UJ	0.277 J	0.202 UJ	0.231 J	0.196 UJ	0.210 UJ
Perfluorooctane sulfonic acid (PFOS)	0.248 U	4.74	5.98	0.100 U	0.097 U	0.096 U	7.03
Perfluorooctanoic acid (PFOA)	0.356 J	5.07	13.1	11.8	10.8	0.245 U	6.20
Perfluoropentanoic acid (PFPeA)	0.079 U	3.92	4.58	30.4	29.9	1.26 J	7.58
Perfluorotetradecanoic acid (PFTeDA)	0.067 U	0.064 U	0.069 U	0.064 U	0.062 U	0.062 U	0.067 U
Perfluorotridecanoic acid (PFTrDA)	0.084 U	0.081 U	0.087 U	0.081 U	0.078 U	0.078 U	0.084 U
Perfluoroundecanoic acid (PFUnDA)	0.177 UJ	0.171 UJ	0.184 U	0.171 U	0.165 U	0.165 UJ	0.177 UJ

Notes:

All results in ng/L

Bold indicates detection

FD = field duplicate

ID = Identifier

J = estimated detection

N = normal sample

ng/L = nanogram(s) per liter

U = analyte not detected

WBZ = water-bearing zone

Table 2-1e. Historical Groundwater Data: Dissolved Gases

Essex-Hope Site, Jamestown, New York

Location ID	HW-6	MW-1	MW-7D	MW-15D	MW-15D	MW-16D	MW-21D	MW-21D	MW-22D	MW-22D	MW-23D	MW-25S	MW-26S	MW-27S	MW-30S	MW-101S
Sample Date	3/16/2017	11/4/2016	11/4/2016	11/1/2016	10/29/2020	10/28/2020	3/14/2017	10/29/2020	11/3/2016	10/29/2020	11/2/2016	11/2/2016	11/2/2016	11/2/2016	11/3/2016	10/28/2020
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-03	OU-03	OU-01	OU-03	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																
Ethane	1.92	0.5 U	144 J	13.6 J	--	--	3.70	--	0.5 U	--	1.33	0.5 UJ	0.5 U	0.5 U	0.5 U	--
Ethene	30.0	0.5 U	575 J	532 J	--	--	3670	--	0.5 U	--	1.39	0.5 UJ	0.5 U	0.5 U	0.5 U	--
Methane	4420	285	2660 J	776 J	2950	33.7	15800	20200	31.3	60.9	25100	0.732 J	3780	138	623	36.4

Notes:
All results in µg/L
Bold indicates detection
µg/L = microgram(s) per liter
FD = field duplicate
ID = Identifier
J = estimated detection
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-1e. Historical Groundwater Data: Dissolved Gases

Essex-Hope Site, Jamestown, New York

Location ID	MW-104S	MW-106D	MW-106D	MW-106D	MW-106S	MW-107S	MW-110D	MW-112S	MW-112S	MW-115D	MW-116S	MW-118D	MW-123D
Sample Date	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/3/2016	11/3/2016	11/3/2016	11/3/2016	10/29/2020	10/29/2020
Shallow or Deep WBZ	Shallow	Deep	Deep	Deep	Shallow	Shallow	Deep	Shallow	Shallow	Deep	Shallow	Deep	Deep
Onsite/Offsite	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	FD	N	N	N	N	N	FD	N	N	N	N
Analyte													
Ethane	--	3.29 J	3.05 J	--	0.5 UJ	0.5 UJ	--	1.23	1.32	0.5 U	2.4	--	--
Ethene	--	172 J	178 J	--	0.711 J	0.5 UJ	--	0.6	0.604	0.5 U	0.5 U	--	--
Methane	2 U	3230 J	3380 J	2070	16.2 J	1.29 J	372	2140	2080	23.6	1520	2770	996

Notes:
All results in µg/L
Bold indicates detection
µg/L = microgram(s) per liter
FD = field duplicate
ID = Identifier
J = estimated detection
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-1f. Historical Groundwater Data: General Chemistry

Essex-Hope Site, Jamestown, New York

Location ID	HW-6	MW-1	MW-7D	MW-15D	MW-15D	MW-16D	MW-21D	MW-21D	MW-22D	MW-22D	MW-23D	MW-25S	MW-26S	MW-26S	MW-27S	MW-27S	MW-30S	MW-30S
Sample Date	3/16/2017	11/4/2016	11/4/2016	11/1/2016	10/29/2020	10/28/2020	3/14/2017	10/29/2020	11/3/2016	10/29/2020	11/2/2016	11/2/2016	11/2/2016	9/18/2019	11/2/2016	9/16/2019	11/3/2016	9/17/2019
Shallow or Deep WBZ	Shallow	Shallow	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Onsite/Offsite	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-03	OU-03	OU-01	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte																		
Alkalinity, Total	294	307	207	318	--	--	488	--	141	--	177	82.9	244	244	83.9	95.7	694	560
Chloride (as Cl)	2.28	16.9	51.4	100	63.1	48	141	43.8	117	185	18.2	250	2.51	2.50	8.78	11.8	19.8	14.1
Nitrate (as N)	0.124	0.029 J	0.1 U	0.1 U	0.1 U	0.1 U	0.100 UJ	0.1 U	0.669	0.49	0.1 U	4.26	0.1 U	--	0.1 U	--	0.022 J	--
Nitrite	0.050 U	0.05 U	0.05 U	0.05 U	--	--	0.050 UJ	--	0.05 U	--	0.05 U	0.05 U	0.018 J	--	0.05 U	--	0.01 J	--
Sulfate	40.7	292	37.6	68.7	36.5	132	1.00 U	1.62	111	85.8	1 U	37.3	1.11	--	8.91	--	130	--
Total Organic Carbon	2.96	2.56	1.47	3.27	2.43	1.61	105	6.33	0.81	1.54	0.8 J	1.05	9.14	--	11.1	--	24.2	--
Sulfide, Reactive	--	0.1 UJ	0.1 UJ	0.1 UJ	--	--	0.10 U	--	0.1 U	--	0.1 UJ	0.1 U	--	--	0.1 UJ	--	0.1 U	--

Notes:
All results in mg/L
Bold indicates detection
FD = field duplicate
ID = Identifier
J = estimated detection
mg/L = milligram(s) per liter
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-1f. Historical Groundwater Data: General Chemistry

Essex-Hope Site, Jamestown, New York

Location ID	MW-31S	MW-101S	MW-104S	MW-106D	MW-106D	MW-106D	MW-106S	MW-107S	MW-110D	MW-112S	MW-112S	MW-115D	MW-116S	MW-117S	MW-118D	MW-123D	MW-124S
Sample Date	9/17/2019	10/28/2020	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/1/2016	11/1/2016	10/29/2020	11/3/2016	11/3/2016	11/3/2016	11/3/2016	9/18/2019	10/29/2020	10/29/2020	9/17/2019
Shallow or Deep WBZ	Shallow	Shallow	Shallow	Deep	Deep	Deep	Shallow	Shallow	Deep	Shallow	Shallow	Deep	Shallow	Shallow	Deep	Deep	Shallow
Onsite/Offsite	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Sample Type	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N	N	N
Analyte																	
Alkalinity, Total	454	--	--	254	255	--	157 J	126	--	505	511	257	229	234	--	--	219
Chloride (as Cl)	23.7	80.1	1.38	28.2	29.3	36.1	116	52.1	83.8	5.53	5.5	19.3	171	49.7	239	57.5 J	4.40
Nitrate (as N)	--	0.26	2.5	0.1 U	0.1 U	0.1 U	0.498	1.04	0.025 J	0.1 U	0.1 U	0.1 U	0.1 U	--	0.1 U	0.057 J	--
Nitrite	--	--	--	0.05 U	0.014 J	--	0.01 J	0.022 J	--	0.018 J	0.016 J	0.05 U	0.05 U	--	--	--	--
Sulfate	--	44.6	182	39.7	43.8	41.9	33.7	22.8	157	49.9	49.4	59.9	6.12	--	4.52	4.56	--
Total Organic Carbon	--	1.55	1.06	2.44	2.36	2.4	1.84	0.71	2.8	17	16.7	2.14	2.6	--	11.4	2.4	--
Sulfide, Reactive	--	--	--	0.1 U	0.1 UJ	--	--	0.1 UJ	--	0.1 U	0.1 U	0.1 U	0.1 U	--	--	--	--

Notes:
All results in mg/L
Bold indicates detection
FD = field duplicate
ID = Identifier
J = estimated detection
mg/L = milligram(s) per liter
N = normal sample
U = analyte not detected
WBZ = water-bearing zone

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-001	DPT-001	DPT-001	DPT-002	DPT-002	DPT-003	DPT-003	DPT-004	DPT-004	DPT-004	DPT-005	DPT-005	DPT-005A	DPT-005A	DPT-005A	DPT-005B	DPT-005B	DPT-005B
Sample Depth (feet bgs)	9 - 10	3 - 4	6 - 7	3 - 4	6 - 8	2 - 3	6 - 8	2 - 3	2 - 3	6 - 7	3 - 4	5 - 6	2 - 4	5 - 7	16 - 17	2 - 4	2 - 4	5 - 7
Sample Date	9/19/2016	9/19/2016	9/19/2016	9/20/2016	9/20/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/20/2017	9/20/2017	9/20/2017	9/19/2017	9/19/2017	9/20/2017
Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																		
1,1,1,2-Tetrachloroethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,1,1-Trichloroethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.14	0.1	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,1,2,2-Tetrachloroethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,1,2-Trichloroethane	0.37 U	0.0019 U	0.0017 U	0.0017 U	0.002 UJ	0.0019 U	0.0016 U	0.13 U	0.12 U	0.0015 U	0.0016 U	0.24 U	0.1 U	0.074 U	3.4 U	0.078 U	0.077 U	0.087 U
1,1-Dichloroethane	0.37 U	0.0019 U	0.0017 U	0.0017 U	0.002 UJ	0.0019 U	0.0016 U	0.13 U	0.12 U	0.0015 U	0.0016 U	0.24 U	0.1 U	0.074 U	3.4 U	0.078 U	0.077 U	0.087 U
1,1-Dichloroethene	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,1-Dichloropropene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,2,3-Trichlorobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,2,3-Trichloropropane	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 U
1,2,4-Trichlorobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,2,4-Trimethylbenzene	36 J	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.00023 J	0.18 J	0.27 J	0.005 U	0.0055 U	0.34 J	0.062 J	0.078 J	7.8 J	0.041 J	0.065 J	0.18 J
1,2-Dibromo-3-Chloropropane	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,2-Dibromoethane (Ethylene Dibromide)	0.98 U	0.005 U	0.0046 U	0.0045 U	0.0052 UJ	0.0051 U	0.0043 U	0.36 U	0.33 U	0.004 U	0.0044 U	0.63 U	0.27 U	0.2 U	9 U	0.21 U	0.2 U	0.23 U
1,2-Dichlorobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,2-Dichloroethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,2-Dichloroethene, cis-	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0015	0.41	0.03 J	0.2	12	0.035 J	0.05 J	0.4
1,2-Dichloroethene, Total	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0015	0.49 J	0.03 J	0.22 J	12	0.035 J	0.05 J	0.42 J
1,2-Dichloroethene, trans-	0.37 U	0.0019 U	0.0017 U	0.0017 U	0.002 UJ	0.0019 U	0.0016 U	0.13 U	0.12 U	0.0015 U	0.0016 U	0.078 J	0.1 U	0.021 J	3.4 U	0.078 U	0.077 U	0.021 J
1,2-Dichloropropane	0.85 U	0.0044 U	0.0041 U	0.004 U	0.0046 UJ	0.0045 U	0.0038 U	0.31 U	0.29 U	0.0035 U	0.0038 U	0.55 U	0.23 U	0.17 U	7.9 U	0.18 U	0.18 U	0.2 U
1,3,5-Trimethylbenzene (Mesitylene)	2.6 J	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.12 J	0.15 J	0.005 U	0.0055 U	0.11 J	0.021 J	0.033 J	1.6 J	0.014 J	0.031 J	0.065 J
1,3-Dichlorobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,3-Dichloropropane	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,3-Dichloropropene, cis-	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,3-Dichloropropene, Total	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,3-Dichloropropene, trans-	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
1,4-Dichlorobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
1,4-Dioxane (p-Dioxane)	24 U	0.12 U	0.12 U	0.11 U	0.13 U	0.13 U	0.11 U	8.9 U	8.2 U	0.1 U	0.11 U	16 U	2.7 U	2 U	90 U	2.1 U	2 U	2.3 U
2,2-Dichloropropane	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
2-Chlorotoluene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
2-Hexanone	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 U
4-Chlorotoluene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Acetone	2.4 U	0.012 U	0.012 U	0.0065 J	0.0096 J	0.013 U	0.011 U	0.89 U	0.82 U	0.012	0.0097 J	1.6 U	0.67 UJ	0.14 J	22 UJ	0.52 UJ	0.51 UJ	0.58 U
Benzene	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.034 J	0.043 J	0.001 U	0.00031 J	0.25	0.03 J	0.025 J	2.2 U	0.015 J	0.028 J	0.095
Bromobenzene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Bromodichloromethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Bromoform	0.98 U	0.005 U	0.0046 U	0.0045 U	0.0052 UJ	0.0051 U	0.0043 U	0.36 U	0.33 U	0.004 U	0.0044 U	0.63 U	0.27 U	0.2 U	9 U	0.21 U	0.2 U	0.23 U
Bromomethane	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.0026 U	0.0021 U	0.032 J	0.054 J	0.002 U	0.0022 U	0.31 U	0.13 U	0.099 U	4.5 U	0.1 U	0.1 U	0.12 U
Butylbenzene, n-	0.95 J	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.027 J	0.068 J	0.001 U	0.0011 U	0.038 J	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.022 J
Butylbenzene, sec-	0.52 J	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.021 J	0.026 J	0.001 U	0.0011 U	0.033 J	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Butylbenzene, t-	0.04 J	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Carbon Disulfide	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-001	DPT-001	DPT-001	DPT-002	DPT-002	DPT-003	DPT-003	DPT-004	DPT-004	DPT-004	DPT-005	DPT-005	DPT-005A	DPT-005A	DPT-005A	DPT-005B	DPT-005B	DPT-005B
Sample Depth (feet bgs)	9 - 10	3 - 4	6 - 7	3 - 4	6 - 8	2 - 3	6 - 8	2 - 3	2 - 3	6 - 7	3 - 4	5 - 6	2 - 4	5 - 7	16 - 17	2 - 4	2 - 4	5 - 7
Sample Date	9/19/2016	9/19/2016	9/19/2016	9/20/2016	9/20/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/20/2017	9/20/2017	9/20/2017	9/19/2017	9/19/2017	9/20/2017
Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																		
Carbon Tetrachloride	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Chlorobenzene	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Chlorobromomethane	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Chloroethane	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.0026 U	0.0021 U	0.18 U	0.16 U	0.002 U	0.0022 U	0.31 U	0.13 U	0.099 U	4.5 U	0.1 U	0.1 U	0.12 U
Chloroform	0.37 U	0.0019 U	0.0017 U	0.0017 U	0.002 UJ	0.0019 U	0.0016 U	0.13 U	0.12 U	0.0015 U	0.00044 J	0.24 U	0.1 U	0.074 U	3.4 U	0.078 U	0.077 U	0.087 U
Chloromethane	1.2 U	0.0063 UJ	0.0058 UJ	0.0057 U	0.0065 UJ	0.0064 UJ	0.0054 UJ	0.44 UJ	0.41 UJ	0.005 UJ	0.0055 UJ	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Dibromochloromethane	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.0011 U	0.16 U	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Dibromomethane (Methylene Bromide)	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 U
Dichlorodifluoromethane	2.4 U	0.012 U	0.012 U	0.011 U	0.013 U	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 UJ	0.5 UJ	22 UJ	0.52 UJ	0.51 UJ	0.58 UJ
Ethylbenzene	1.1 J	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.13 J	0.24 J	0.001 U	0.0011 U	0.23	0.021 J	0.04 J	2.2 U	0.015 J	0.021 J	0.085
Hexachlorobutadiene	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Isopropylbenzene (Cumene)	1.2 J	0.0012 U	0.0012 U	0.0011 U	0.00071 J	0.0013 U	0.0011 U	0.031 J	0.056 J	0.001 U	0.0011 U	0.063 J	0.067 U	0.012 J	2.2 U	0.052 U	0.051 U	0.023 J
Methyl Ethyl Ketone (2-Butanone)	2.4 U	0.012 UJ	0.012 UJ	0.011 U	0.013 UJ	0.013 UJ	0.011 UJ	0.89 UJ	0.82 UJ	0.01 UJ	0.011 UJ	1.6 U	0.67 UJ	0.5 UJ	22 UJ	0.52 UJ	0.51 UJ	0.58 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.5 J	0.27 J	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 U
Methyl tert-butyl Ether (MTBE)	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.18 U	0.16 U	0.002 U	0.0022 U	0.31 U	0.13 U	0.099 U	4.5 U	0.1 U	0.1 U	0.12 U
Methylene Chloride	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.002 J	0.48 J	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.18 J
Naphthalene	1.1 J	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.088 J	0.064 J	0.005 U	0.0055 U	0.37 J	0.086 J	0.11 J	11 U	0.062 J	0.1 J	0.21 J
n-Propylbenzene	6.3 J	0.0012 U	0.0012 U	0.0011 U	0.00022 J	0.0013 U	0.0011 U	0.034 J	0.045 J	0.001 U	0.0011 U	0.12 J	0.022 J	0.027 J	0.8 J	0.012 J	0.018 J	0.047 J
p-Isopropyltoluene	0.53 J	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.011 J	0.017 J	0.001 U	0.0011 U	0.021 J	0.018 J	0.018 J	2.2 U	0.036 J	0.066	0.027 J
Styrene	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.18 U	0.16 U	0.002 U	0.0022 U	0.31 U	0.13 U	0.099 U	4.5 U	0.1 U	0.1 U	0.12 U
Tetrachloroethene	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.062 J	0.07 J	0.001 U	0.0011 U	0.028 J	0.067 U	0.05 U	2.2 U	0.052 U	0.051 U	0.058 U
Toluene	0.37 U	0.0019 U	0.0017 U	0.0017 U	0.002 UJ	0.0019 U	0.0016 U	0.85	0.73	0.0015 U	0.00032 J	0.76	0.092 J	0.11	3.4 U	0.048 J	0.081	0.32
Trichloroethene	0.24 U	0.0012 U	0.0012 U	0.0011 U	0.0013 UJ	0.0013 U	0.0011 U	0.089 U	0.082 U	0.001 U	0.014	18	1.6	3.3	180	0.89	1.7	6.9
Trichlorofluoromethane	1.2 U	0.0063 U	0.0058 U	0.0057 U	0.0065 UJ	0.0064 U	0.0054 U	0.44 U	0.41 U	0.005 U	0.0055 U	0.78 U	0.34 U	0.25 U	11 U	0.26 U	0.26 U	0.29 U
Vinyl Acetate	2.4 U	0.012 U	0.012 U	0.011 U	0.013 UJ	0.013 U	0.011 U	0.89 U	0.82 U	0.01 U	0.011 U	1.6 U	0.67 U	0.5 U	22 U	0.52 U	0.51 U	0.58 UJ
Vinyl Chloride	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.18 U	0.16 U	0.002 U	0.0022 U	0.31 U	0.13 U	0.099 U	4.5 U	0.1 U	0.1 U	0.12 U
Xylene, m- & p-	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.8 J	1.3 J	0.002 U	0.0022 U	0.72	0.085 J	0.12	4.5 U	0.065 J	0.086 J	0.32
Xylene, o-	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.44 J	0.85 J	0.002 U	0.0022 U	0.4	0.066 J	0.077 J	4.5 U	0.046 J	0.055 J	0.16
Xylenes, Total	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	1.2 J	2.2 J	0.002 U	0.0022 U	1.1	0.15 J	0.2 J	4.5 U	0.11 J	0.14 J	0.48
Total CBTEX	2.3 J	0.0025 U	0.0023 U	0.0023 U	0.00071 J	0.0026 U	0.0021 U	2.245	3.269	0.002 U	0.00063 J	2.403	0.294 J	0.384 J	4.5 U	0.189 J	0.271 J	1.003 J
Total CVOC	0.49 U	0.0025 U	0.0023 U	0.0023 U	0.0026 UJ	0.0026 U	0.0021 U	0.062	0.07	0.002 U	0.0155	18.516	1.63 J	3.521 J	192	0.925 J	1.75 J	7.501 J
Total VOC	50 J	0.12 U	0.12 U	0.0065 J	0.011 J	0.13 U	0.00023 J	4.7 J	6.6 J	0.012	0.03 J	24 J	2.133 J	4.311 J	202.2 J	1.279 J	2.301 J	9.055 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-005C	DPT-005C	DPT-005D	DPT-005D	DPT-006	DPT-006	DPT-007	DPT-007	DPT-007	DPT-007	DPT-008	DPT-009	DPT-012	DPT-012	DPT-020	DPT-020	DPT-021	DPT-021
Sample Depth (feet bgs)	2 - 4	5 - 7	2 - 4	5 - 7	3 - 4	7 - 8	18 - 19	22 - 23	33 - 34	34 - 36	38 - 39	30 - 32	2 - 4	6 - 8	2 - 4	6 - 8	2 - 4	6 - 8
Sample Date	9/25/2017	9/26/2017	9/20/2017	9/20/2017	9/19/2016	9/19/2016	9/21/2016	9/21/2016	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/13/2017	9/13/2017	9/19/2017	9/19/2017	9/19/2017	9/19/2017
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																		
1,1,1,2-Tetrachloroethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,1,1-Trichloroethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,1,2,2-Tetrachloroethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,1,2-Trichloroethane	0.088 U	0.096 U	0.1 U	0.0011 U	0.0018 U	0.0016 U	0.086 U	5.6 U	0.5 U	1.1 U	0.002 U	1 U	0.0013 U	0.0013 U	0.0014 U	0.082 U	0.0015 U	0.17 U
1,1-Dichloroethane	0.088 U	0.096 U	0.1 U	0.0011 U	0.0018 U	0.0016 U	0.086 U	5.6 U	0.5 U	1.1 U	0.002 U	1 U	0.0013 U	0.0013 U	0.0014 U	0.082 U	0.0015 U	0.17 U
1,1-Dichloroethene	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.22 J	0.74 U	0.00066 J	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,1-Dichloropropene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2,3-Trichlorobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0002 J	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2,3-Trichloropropane	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 U	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
1,2,4-Trichlorobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2,4-Trimethylbenzene	0.046 J	0.082 J	0.23 J	0.00093 J	0.0061 U	0.0054 U	1.5	19 U	1.6 U	0.21 J	0.0067 U	0.16 J	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2-Dibromo-3-Chloropropane	0.29 UJ	0.32 UJ	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2-Dibromoethane (Ethylene Dibromide)	0.23 U	0.26 U	0.28 U	0.0030 U	0.0049 U	0.0043 U	0.23 U	15 U	1.3 U	3 U	0.0054 U	2.8 U	0.0035 U	0.0035 U	0.0038 U	0.22 U	0.0039 U	0.45 U
1,2-Dichlorobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,2-Dichloroethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 UJ	0.00088 UJ	0.00096 U	0.054 U	0.00098 U	0.11 U
1,2-Dichloroethene, cis-	0.11	0.19	0.28	0.00039 J	0.0012 U	0.0011 U	0.66	91	10	11	0.2	11	0.00088 U	0.00088 U	0.00082 J	0.054 U	0.00098 U	0.11 U
1,2-Dichloroethene, Total	0.13 J	0.21 J	0.34 J	0.00039 J	0.0012 U	0.0011 U	0.66	91	10 J	11	0.2 J	11	0.00088 U	0.00088 U	0.00082 J	0.054 U	0.00098 U	0.11 U
1,2-Dichloroethene, trans-	0.022 J	0.02 J	0.063 J	0.0011 U	0.0018 U	0.0016 U	0.086 U	5.6 U	0.19 J	1.1 U	0.00032 J	1 U	0.0013 U	0.0013 U	0.0014 U	0.082 U	0.0015 U	0.17 U
1,2-Dichloropropane	0.2 U	0.22 U	0.24 U	0.0026 U	0.0043 U	0.0038 U	0.2 U	13 U	1.2 U	2.6 U	0.0047 U	2.4 U	0.0031 U	0.0031 U	0.0034 U	0.19 U	0.0034 U	0.39 U
1,3,5-Trimethylbenzene (Mesitylene)	0.023 J	0.04 J	0.078 J	0.0037 U	0.0061 U	0.0054 U	0.39	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,3-Dichlorobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,3-Dichloropropane	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,3-Dichloropropene, cis-	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,3-Dichloropropene, Total	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,3-Dichloropropene, trans-	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
1,4-Dichlorobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
1,4-Dioxane (p-Dioxane)	2.3 U	2.6 U	2.8 U	0.03 U	0.12 U	0.11 U	5.7 U	380 U	33 U	74 U	0.13 U	69 U	0.035 U	0.035 U	0.038 U	2.2 U	0.039 U	4.5 U
2,2-Dichloropropane	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
2-Chlorotoluene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
2-Hexanone	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
4-Chlorotoluene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Acetone	0.59 U	0.45 J	0.7 UJ	0.0075 UJ	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 J	0.0096 UJ	0.54 UJ	0.0098 UJ	1.1 UJ
Benzene	0.025 J	0.027 J	0.31	0.00075 U	0.0012 U	0.0011 U	0.021 J	3.8 U	0.2 J	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Bromobenzene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Bromodichloromethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Bromoform	0.23 U	0.26 U	0.28 U	0.0030 U	0.0049 U	0.0043 U	0.23 U	15 U	1.3 U	3 U	0.0054 U	2.8 U	0.0035 UJ	0.0035 U	0.0038 U	0.22 U	0.0039 U	0.45 U
Bromomethane	0.085 J	0.13 UJ	0.14 U	0.0015 U	0.0024 U	0.0022 U	0.11 U	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Butylbenzene, n-	0.059 U	0.064 U	0.025 J	0.00075 U	0.0012 U	0.0011 U	0.0086 J	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 UJ	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Butylbenzene, sec-	0.013 J	0.064 U	0.024 J	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 UJ	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Butylbenzene, t-	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Carbon Disulfide	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 U	0.0088 U	0.0096 U	0.1 J	0.0098 U	1.1 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-005C	DPT-005C	DPT-005D	DPT-005D	DPT-006	DPT-006	DPT-007	DPT-007	DPT-007	DPT-007	DPT-008	DPT-009	DPT-012	DPT-012	DPT-020	DPT-020	DPT-021	DPT-021
Sample Depth (feet bgs)	2 - 4	5 - 7	2 - 4	5 - 7	3 - 4	7 - 8	18 - 19	22 - 23	33 - 34	34 - 36	38 - 39	30 - 32	2 - 4	6 - 8	2 - 4	6 - 8	2 - 4	6 - 8
Sample Date	9/25/2017	9/26/2017	9/20/2017	9/20/2017	9/19/2016	9/19/2016	9/21/2016	9/21/2016	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/13/2017	9/13/2017	9/19/2017	9/19/2017	9/19/2017	9/19/2017
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-01	OU-03	OU-03	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																		
Carbon Tetrachloride	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Chlorobenzene	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Chlorobromomethane	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Chloroethane	0.12 U	0.13 U	0.14 U	0.0015 U	0.0024 U	0.0022 U	0.11 U	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Chloroform	0.088 U	0.096 U	0.1 U	0.0011 U	0.0018 U	0.0016 U	0.086 U	5.6 U	0.5 U	1.1 U	0.002 U	1 U	0.0013 U	0.0013 U	0.0014 U	0.082 U	0.0015 U	0.17 U
Chloromethane	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 UJ	0.0054 UJ	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Dibromochloromethane	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Dibromomethane (Methylene Bromide)	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 U	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
Dichlorodifluoromethane	0.59 UJ	0.64 UJ	0.7 UJ	0.0075 UJ	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 UJ	0.0096 UJ	0.54 UJ	0.0098 UJ	1.1 UJ
Ethylbenzene	0.015 J	0.067	0.1	0.00075 U	0.0012 U	0.0011 U	0.053 J	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Hexachlorobutadiene	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Isopropylbenzene (Cumene)	0.014 J	0.064 U	0.029 J	0.00075 U	0.0012 U	0.0011 U	0.04 J	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Methyl Ethyl Ketone (2-Butanone)	0.59 UJ	0.64 UJ	0.7 UJ	0.0075 UJ	0.012 UJ	0.011 UJ	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 UJ	0.0096 UJ	0.54 UJ	0.0098 UJ	1.1 UJ
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
Methyl tert-butyl Ether (MTBE)	0.12 U	0.13 U	0.14 U	0.0015 U	0.0024 U	0.0022 U	0.11 U	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Methylene Chloride	0.59 U	0.18 J	0.13 J	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	0.86 J	0.013 U	6.9 U	0.0088 U	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
Naphthalene	0.076 J	0.24 J	0.2 J	0.00018 J	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.00022 J	3.5 U	0.0044 UJ	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
n-Propylbenzene	0.059 U	0.028 J	0.05 J	0.00075 U	0.0012 U	0.0011 U	0.22	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 UJ	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
p-Isopropyltoluene	0.16	0.064 U	3	0.00075 U	0.0012 U	0.0011 U	0.011 J	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00088 UJ	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Styrene	0.12 U	0.13 U	0.14 U	0.0015 U	0.0024 U	0.0022 U	0.11 U	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 UJ	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Tetrachloroethene	0.059 U	0.064 U	0.07 U	0.00075 U	0.0012 U	0.0011 U	0.057 U	3.8 U	0.33 U	0.74 U	0.0013 U	0.69 U	0.00087 J	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Toluene	0.082 J	0.14	0.57	0.0011 U	0.0018 U	0.0016 U	0.086 U	5.6 U	0.5 U	0.53 J	0.002 U	0.62 J	0.0013 U	0.0013 U	0.0014 U	0.082 U	0.0015 U	0.17 U
Trichloroethene	0.45	6.2	2.6	0.0050	0.0016	0.00027 J	0.17	270	40	76	0.0014	88	0.00088 U	0.00088 U	0.00096 U	0.054 U	0.00098 U	0.11 U
Trichlorofluoromethane	0.29 U	0.32 U	0.35 U	0.0037 U	0.0061 U	0.0054 U	0.29 U	19 U	1.6 U	3.7 U	0.0067 U	3.5 U	0.0044 U	0.0044 U	0.0048 U	0.27 U	0.0049 U	0.56 U
Vinyl Acetate	0.59 U	0.64 U	0.7 U	0.0075 U	0.012 U	0.011 U	0.57 U	38 U	3.3 U	7.4 U	0.013 U	6.9 U	0.0088 UJ	0.0088 U	0.0096 U	0.54 U	0.0098 U	1.1 U
Vinyl Chloride	0.12 U	0.13 U	0.078 J	0.0015 U	0.0024 U	0.0022 U	0.012 J	1.1 J	0.6 J	0.42 J	0.066	0.19 J	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Xylene, m- & p-	0.074 J	0.32	0.4	0.0015 U	0.0024 U	0.0022 U	0.2	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Xylene, o-	0.057 J	0.14 J	0.21	0.0015 U	0.0024 U	0.0022 U	0.13	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 UJ	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Xylenes, Total	0.13 J	0.46	0.61	0.0015 U	0.0024 U	0.0022 U	0.33	7.5 U	0.66 U	1.5 U	0.0027 U	1.4 U	0.0018 U	0.0018 U	0.0019 U	0.11 U	0.0020 U	0.22 U
Total CBTEX	0.267 J	0.694 J	1.619 J	0.0015 U	0.0024 U	0.0022 U	0.444 J	7.5 U	0.2 J	0.53 J	0.0027 U	0.62 J	0.0018 UJ	0.0018 U	0.0019 U	0.11 U	0.002 U	0.22 U
Total CVOC	0.582 J	6.59 J	3.151 J	0.00539 J	0.0016	0.00027 J	0.842	362.1	51.01	87.42	0.26838	99.19	0.00087 J	0.0018 U	0.00082 J	0.11 U	0.0020 U	0.22 U
Total VOC	1.252 J	8.124 J	8.377 J	0.0065 J	0.0016	0.00027 J	4.4 J	450 J	61 J	100 J	0.47 J	110 J	0.00087 J	0.0088 J	0.00082 J	0.1 J	0.039 UJ	4.5 UJ

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-022	DPT-022	DPT-022	DPT-024	DPT-024	DPT-024	DPT-024	DPT-025	DPT-025	DPT-025	DPT-025	DPT-026	DPT-026	DPT-026	DPT-026	DPT-027	DPT-027	DPT-027
Sample Depth (feet bgs)	2 - 4	2 - 4	6 - 8	10 - 12	30 - 32	30 - 32	38 - 40	10 - 12	26 - 28	26 - 28	34 - 36	3 - 4.5	8 - 10	24 - 26	36 - 38	8 - 9	22 - 23	33 - 34
Sample Date	9/19/2017	9/19/2017	9/19/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	10/6/2017	10/6/2017	10/6/2017
Sample Type	N	FD	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,1,1-Trichloroethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,1,2,2-Tetrachloroethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,1,2-Trichloroethane	0.0015 U	0.0015 U	0.0013 U	0.0013 U	0.53 U	1.8 U	0.089 U	0.0012 U	18 U	0.092 U	0.097 U	0.11 U	0.098 U	5.6 U	0.082 U	0.0013 U	1.4 U	0.14 U
1,1-Dichloroethane	0.0015 U	0.0015 U	0.0013 U	0.0013 U	0.53 U	1.8 U	0.089 U	0.0012 U	18 U	0.092 U	0.097 U	0.11 U	0.098 U	5.6 U	0.082 U	0.0013 U	1.4 U	0.14 U
1,1-Dichloroethene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.2 J	1.2 U	0.059 U	0.00084 U	12 U	0.21	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.057 J
1,1-Dichloropropene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,2,3-Trichlorobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.032 J	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,2,3-Trichloropropane	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
1,2,4-Trichlorobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,2,4-Trimethylbenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	8.4 J	12 J	0.32 U	0.076 J	0.051 J	14 J	0.27 U	0.0043 U	1.4 J	0.47 U
1,2-Dibromo-3-Chloropropane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0040 U	0.0040 U	0.0036 U	0.0034 U	1.4 U	4.9 U	0.24 U	0.0034 U	49 U	0.25 U	0.26 U	0.28 U	0.26 U	15 U	0.22 U	0.0034 U	3.7 U	0.38 U
1,2-Dichlorobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,2-Dichloroethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,2-Dichloroethene, cis-	0.0020	0.00099 U	0.00054 J	0.00038 J	13 J	28 J	0.4	0.00040 J	48	56	0.065 U	0.071 U	0.065 U	100	0.02 J	0.00086 U	72	2.7
1,2-Dichloroethene, Total	0.0020	0.00099 U	0.00054 J	0.00038 J	13 J	28 J	0.45 J	0.00040 J	48	56	0.065 U	0.071 U	0.065 U	100	0.02 J	0.00086 U	72	2.8 J
1,2-Dichloroethene, trans-	0.0015 U	0.0015 U	0.0013 U	0.0013 U	0.53 U	1.8 U	0.051 J	0.0012 U	18 U	0.18	0.097 U	0.11 U	0.098 U	5.6 U	0.082 U	0.0013 U	1.4 U	0.12 J
1,2-Dichloropropane	0.0035 U	0.0035 U	0.0031 U	0.0030 U	1.2 U	4.3 U	0.21 U	0.0029 U	43 U	0.22 U	0.23 U	0.25 U	0.23 U	13 U	0.19 U	0.0030 U	3.2 U	0.33 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	2.3 J	2.7	0.32 U	0.03 J	0.019 J	3.6 J	0.27 U	0.0043 U	0.33 J	0.47 U
1,3-Dichlorobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,3-Dichloropropane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,3-Dichloropropene, cis-	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,3-Dichloropropene, Total	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,3-Dichloropropene, trans-	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
1,4-Dichlorobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
1,4-Dioxane (p-Dioxane)	0.04 U	0.04 U	0.036 U	0.034 U	14 U	49 U	2.4 U	0.034 U	490 U	2.5 U	2.6 U	2.8 U	2.6 U	150 U	2.2 U	0.034 UJ	37 UJ	3.8 U
2,2-Dichloropropane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
2-Chlorotoluene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
2-Hexanone	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
4-Chlorotoluene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Acetone	0.01 UJ	0.0099 UJ	0.0090 UJ	0.0085 UJ	3.5 UJ	12 UJ	0.59 UJ	0.0084 UJ	120 UJ	0.62 UJ	0.65 UJ	0.71 UJ	0.65 UJ	37 UJ	0.55 UJ	0.0092 J	2.2 J	0.95 U
Benzene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.86	0.00084 U	12 U	0.098	0.95	0.071 U	0.065 U	3.7 U	0.52	0.00025 J	0.93 U	0.2
Bromobenzene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Bromodichloromethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Bromoform	0.0040 U	0.0040 U	0.0036 U	0.0034 U	1.4 U	4.9 U	0.24 U	0.0034 U	49 U	0.25 U	0.26 U	0.28 U	0.26 U	15 U	0.22 U	0.0034 U	3.7 U	0.38 U
Bromomethane	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	0.12 U	0.13 U	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.19 U
Butylbenzene, n-	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.16	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Butylbenzene, sec-	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.1	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Butylbenzene, t-	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Carbon Disulfide	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-022	DPT-022	DPT-022	DPT-024	DPT-024	DPT-024	DPT-024	DPT-025	DPT-025	DPT-025	DPT-025	DPT-026	DPT-026	DPT-026	DPT-026	DPT-027	DPT-027	DPT-027
Sample Depth (feet bgs)	2 - 4	2 - 4	6 - 8	10 - 12	30 - 32	30 - 32	38 - 40	10 - 12	26 - 28	26 - 28	34 - 36	3 - 4.5	8 - 10	24 - 26	36 - 38	8 - 9	22 - 23	33 - 34
Sample Date	9/19/2017	9/19/2017	9/19/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/21/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	10/6/2017	10/6/2017	10/6/2017
Sample Type	N	FD	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Chlorobenzene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Chlorobromomethane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Chloroethane	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	0.12 U	0.13 U	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.19 U
Chloroform	0.0015 U	0.0015 U	0.0013 U	0.0013 U	0.53 U	1.8 U	0.089 U	0.0012 U	18 U	0.092 U	0.097 U	0.11 U	0.098 U	5.6 U	0.082 U	0.0013 U	1.4 U	0.14 U
Chloromethane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.066 J	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.00075 J	4.6 U	0.47 U
Dibromochloromethane	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.062 U	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Dibromomethane (Methylene Bromide)	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
Dichlorodifluoromethane	0.01 UJ	0.0099 UJ	0.0090 UJ	0.0085 UJ	3.5 UJ	12 UJ	0.59 UJ	0.0084 UJ	120 UJ	0.62 UJ	0.65 UJ	0.71 UJ	0.65 UJ	37 UJ	0.55 UJ	0.0086 U	9.3 U	0.95 U
Ethylbenzene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.2	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Hexachlorobutadiene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Isopropylbenzene (Cumene)	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.16	0.065 U	0.071 U	0.065 U	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Methyl Ethyl Ketone (2-Butanone)	0.01 UJ	0.0099 UJ	0.0090 UJ	0.0085 UJ	3.5 UJ	12 UJ	0.59 UJ	0.0084 UJ	120 UJ	0.62 UJ	0.65 UJ	0.71 UJ	0.65 UJ	37 UJ	0.55 UJ	0.0086 UJ	9.3 UJ	0.13 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
Methyl tert-butyl Ether (MTBE)	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	0.12 U	0.13 U	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.19 U
Methylene Chloride	0.01 U	0.0099 U	0.0090 U	0.0085 U	0.7 J	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
Naphthalene	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.00018 J	15 J	0.31 J	0.32 U	5.9	6	19 U	0.018 J	0.0043 U	4.6 U	0.47 U
n-Propylbenzene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	1	0.065 U	0.071 U	0.065 U	1.1 J	0.055 U	0.00086 U	0.93 U	0.095 U
p-Isopropyltoluene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	0.07	0.065 U	0.053 J	0.043 J	3.7 U	0.055 U	0.00086 U	0.93 U	0.095 U
Styrene	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	0.12 U	0.13 U	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.19 U
Tetrachloroethene	0.0010 U	0.00099 U	0.00090 U	0.00085 U	0.35 U	1.2 U	0.059 U	0.00084 U	12 U	2.8	0.065 U	0.071 U	0.065 U	2.5 J	0.055 U	0.00086 U	0.31 J	0.095 U
Toluene	0.0015 U	0.0015 U	0.0013 U	0.0013 U	0.53 U	1.8 U	0.089 U	0.0012 U	18 U	0.2	0.097 U	0.11 U	0.015 J	5.6 U	0.082 U	0.00021 J	1.4 U	0.14 U
Trichloroethene	0.00083 J	0.00099 U	0.00090 U	0.0013	56	140	0.075	0.00065 J	1100	1400	0.065 U	0.032 J	0.028 J	1000	0.049 J	0.00060 J	81	9.9
Trichlorofluoromethane	0.0051 U	0.0050 U	0.0045 U	0.0043 U	1.8 U	6.1 U	0.3 U	0.0042 U	61 U	0.31 U	0.32 U	0.36 U	0.32 U	19 U	0.27 U	0.0043 U	4.6 U	0.47 U
Vinyl Acetate	0.01 U	0.0099 U	0.0090 U	0.0085 U	3.5 U	12 U	0.59 U	0.0084 U	120 U	0.62 U	0.65 U	0.71 U	0.65 U	37 U	0.55 U	0.0086 U	9.3 U	0.95 U
Vinyl Chloride	0.0016 J	0.0020 U	0.0018 U	0.0017 U	0.84	2.4 U	1.5	0.00034 J	24 U	0.5	0.83	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.16 J
Xylene, m- & p-	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	1.3	0.13 U	0.032 J	0.13 U	7.5 U	0.11 U	0.0017 U	0.36 J	0.19 U
Xylene, o-	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	0.81	0.13 U	0.14 U	0.13 U	7.5 U	0.11 U	0.0017 U	1.8 U	0.19 U
Xylenes, Total	0.0020 U	0.0020 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.12 U	0.0017 U	24 U	2.1	0.13 U	0.032 J	0.13 U	7.5 U	0.11 U	0.0017 U	0.36 J	0.19 U
Total CBTEX	0.002 U	0.002 U	0.0018 U	0.0017 U	0.71 U	2.4 U	0.86	0.0017 U	24 U	2.768	0.95	0.032 J	0.015 J	7.5 U	0.52	0.00046 J	0.36 J	0.2
Total CVOC	0.00443 J	0.0099 UJ	0.00054 J	0.00168 J	70.74 J	168 J	2.026 J	0.00139 J	1148	1459.788 J	0.83	0.032 J	0.028 J	1102.5 J	0.069 J	0.00135 J	153.31 J	12.937 J
Total VOC	0.00443 J	0.04 UJ	0.00054 J	0.00168 J	70.74 J	168 J	2.886 J	0.00157 J	1173.7 J	1478.896 J	1.78	6.123 J	6.156 J	1121.2 J	0.607 J	0.01101 J	157.6 J	13.267 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-028	DPT-028	DPT-028	DPT-029	DPT-029	DPT-029	DPT-029	DPT-030	DPT-030	DPT-030	DPT-030	DPT-031	DPT-031	DPT-031	DPT-032	DPT-032	DPT-032	DPT-032
Sample Depth (feet bgs)	9 - 11	11 - 13	14 - 16	10 - 12	18 - 20	20 - 22	26 - 28	10 - 12	18 - 20	18 - 20	20 - 22	10 - 12	17 - 19	21 - 23	11 - 13	20 - 22	22 - 24	22 - 24
Sample Date	9/25/2019	9/25/2019	9/25/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/20/2019	9/20/2019	9/20/2019	9/20/2019
Sample Type	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD
Operable Unit	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,1,1-Trichloroethane	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,1,2,2-Tetrachloroethane	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,1,2-Trichloroethane	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,1-Dichloroethane	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,1-Dichloroethene	0.00099 U	0.071 U	0.015 J	0.0010 U	0.0012 U	0.034 J	0.043 J	0.0010 U	0.0010 U	0.0012 U	0.05 J	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,1-Dichloropropene	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,2,3-Trichlorobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,2,3-Trichloropropane	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,2,4-Trichlorobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,2,4-Trimethylbenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,2-Dibromo-3-Chloropropane	0.0030 U	0.21 U	0.19 U	0.0031 U	0.0036 U	0.2 U	0.23 U	0.0030 U	0.0031 U	0.0036 U	0.2 U	0.0033 U	0.21 U	1 U	0.0033 UJ	4.1 U	2.1 U	2.1 U
1,2-Dibromoethane (Ethylene Dibromide)	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,2-Dichlorobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,2-Dichloroethane	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,2-Dichloroethene, cis-	0.00099 U	0.55	0.49	0.0010 U	0.0064	18	7.6	0.00061 J	0.0039	0.0025	19	0.0011 U	0.17	45	0.0011 UJ	17	12	13
1,2-Dichloroethene, Total	0.00099 U	0.57 J	0.53 J	0.00026 J	0.0064	18 J	7.8	0.00061 J	0.0039	0.0025	19 J	0.0011 U	0.17	45 J	0.0011 UJ	17	12	13
1,2-Dichloroethene, trans-	0.0015 U	0.016 J	0.04 J	0.00026 J	0.0018 U	0.048 J	0.19	0.0015 U	0.0016 U	0.0018 U	0.052 J	0.0016 U	0.11 U	0.13 J	0.0016 UJ	2.1 U	1.1 U	1 U
1,2-Dichloropropane	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,3-Dichlorobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,3-Dichloropropane	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,3-Dichloropropene, cis-	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,3-Dichloropropene, Total	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
1,3-Dichloropropene, trans-	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
1,4-Dichlorobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
1,4-Dioxane (p-Dioxane)	0.079 U	5.7 U	5 U	0.083 U	0.095 U	5.3 U	6.2 U	0.081 U	0.083 U	0.095 U	5.4 U	0.087 U	5.7 U	27 U	0.088 UJ	110 UJ	56 UJ	56 U
2,2-Dichloropropane	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
2-Chlorotoluene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
2-Hexanone	0.0099 U	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.01 U	0.01 U	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U
4-Chlorotoluene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
Acetone	0.13 J	0.71 U	0.63 U	0.15 J	0.19 J	0.66 U	0.78 U	0.41 J	0.18 J	0.14 J	0.68 U	0.13 J	0.71 U	3.4 U	1.5 J	14 U	7.1 U	7 U
Benzene	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.014 J	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
Bromobenzene	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
Bromodichloromethane	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
Bromoform	0.0040 U	0.28 U	0.25 U	0.0042 U	0.0048 U	0.26 U	0.31 U	0.0040 U	0.0042 U	0.0048 U	0.27 U	0.0044 U	0.28 U	1.4 U	0.0044 UJ	5.5 U	2.8 U	2.8 U
Bromomethane	0.0020 UJ	0.14 U	0.12 UJ	0.0021 UJ	0.0024 UJ	0.13 U	0.16 UJ	0.0020 UJ	0.0021 UJ	0.0024 UJ	0.14 UJ	0.0022 UJ	0.14 UJ	0.69 UJ	0.0022 UJ	2.8 UJ	1.4 UJ	1.4 UJ
Butylbenzene, n-	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0016 J	1.4 U	0.71 U	0.7 U
Butylbenzene, sec-	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0029 J	1.4 U	0.71 U	0.7 U
Butylbenzene, t-	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0015 J	2.8 U	1.4 U	1.4 U
Carbon Disulfide	0.0099 U	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.01 U	0.01 U	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-028	DPT-028	DPT-028	DPT-029	DPT-029	DPT-029	DPT-029	DPT-030	DPT-030	DPT-030	DPT-030	DPT-031	DPT-031	DPT-031	DPT-032	DPT-032	DPT-032	DPT-032
Sample Depth (feet bgs)	9 - 11	11 - 13	14 - 16	10 - 12	18 - 20	20 - 22	26 - 28	10 - 12	18 - 20	18 - 20	20 - 22	10 - 12	17 - 19	21 - 23	11 - 13	20 - 22	22 - 24	22 - 24
Sample Date	9/25/2019	9/25/2019	9/25/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/26/2019	9/20/2019	9/20/2019	9/20/2019	9/20/2019
Sample Type	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD
Operable Unit	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Chlorobenzene	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
Chlorobromomethane	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
Chloroethane	0.0020 UJ	0.14 UJ	0.12 UJ	0.0021 UJ	0.0024 UJ	0.13 UJ	0.16 UJ	0.0020 UJ	0.0021 UJ	0.0024 UJ	0.14 UJ	0.0022 UJ	0.14 UJ	0.69 UJ	0.0022 UJ	2.8 UJ	1.4 UJ	1.4 UJ
Chloroform	0.0015 U	0.11 U	0.094 U	0.0016 U	0.0018 U	0.099 U	0.12 U	0.0015 U	0.0016 U	0.0018 U	0.1 U	0.0016 U	0.11 U	0.52 U	0.0016 U	2.1 U	1.1 U	1 U
Chloromethane	0.0040 U	0.28 U	0.25 U	0.0042 U	0.0048 U	0.26 U	0.31 U	0.0040 U	0.0042 U	0.0048 U	0.27 U	0.0044 U	0.28 U	1.4 U	0.0044 UJ	5.5 U	2.8 U	2.8 U
Dibromochloromethane	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Dibromomethane (Methylene Bromide)	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
Dichlorodifluoromethane	0.0099 U	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.01 U	0.01 U	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U
Ethylbenzene	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Hexachlorobutadiene	0.0040 U	0.28 U	0.25 U	0.0042 U	0.0048 U	0.26 U	0.31 U	0.0040 U	0.0042 U	0.0048 U	0.27 U	0.0044 U	0.28 UJ	1.4 U	0.0044 UJ	5.5 U	2.8 U	2.8 U
Isopropylbenzene (Cumene)	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.00066 J	1.4 U	0.71 U	0.7 U
Methyl Ethyl Ketone (2-Butanone)	0.0027 J	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.0086 J	0.0033 J	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0099 U	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.01 U	0.01 U	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U
Methyl tert-butyl Ether (MTBE)	0.00062 J	0.14 U	0.12 U	0.0011 J	0.00073 J	0.13 U	0.16 U	0.00096 J	0.00063 J	0.00079 J	0.14 U	0.0010 J	0.14 U	0.69 U	0.0024 J	2.8 U	1.4 U	1.4 U
Methylene Chloride	0.0049 U	0.36 U	0.31 U	0.0052 U	0.0060 U	0.33 U	0.39 U	0.0050 U	0.0052 U	0.0060 U	0.34 U	0.0054 U	0.36 U	1.7 U	0.0055 UJ	6.9 U	3.5 U	3.5 U
Naphthalene	0.0040 U	0.28 U	0.25 U	0.0042 U	0.0048 U	0.26 U	0.31 U	0.0040 U	0.0042 U	0.0048 U	0.27 U	0.0044 U	0.28 U	1.4 U	0.0044 UJ	5.5 U	2.8 U	2.8 U
n-Propylbenzene	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
p-Isopropyltoluene	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Styrene	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Tetrachloroethene	0.00049 U	0.036 U	0.031 U	0.00052 U	0.00060 U	0.033 U	0.039 U	0.00050 U	0.00052 U	0.00060 U	0.034 U	0.00054 U	0.036 U	0.17 U	0.00055 UJ	0.69 U	0.35 U	0.35 U
Toluene	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Trichloroethene	0.00082 U	6	7.3	0.00052 U	0.00060 U	0.084	7.5	0.0015	0.016 J	0.00060 U	0.011 J	0.00054 U	4.2	60	0.00055 UJ	190	140	150
Trichlorofluoromethane	0.0040 U	0.28 U	0.25 UJ	0.0042 U	0.0048 U	0.26 U	0.31 U	0.0040 U	0.0042 U	0.0048 U	0.27 U	0.0044 U	0.28 UJ	1.4 U	0.0044 UJ	5.5 U	2.8 U	2.8 U
Vinyl Acetate	0.0099 U	0.71 U	0.63 U	0.01 U	0.012 U	0.66 U	0.78 U	0.01 U	0.01 U	0.012 U	0.68 U	0.011 U	0.71 U	3.4 U	0.011 UJ	14 U	7.1 U	7 U
Vinyl Chloride	0.00099 U	0.071 U	0.063 U	0.0010 U	0.01	0.78	0.084	0.0010 U	0.0022	0.0023	0.48	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Xylene, m- & p-	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.16 U	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.0022 UJ	2.8 U	1.4 U	1.4 U
Xylene, o-	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Xylenes, Total	0.00099 U	0.071 U	0.063 U	0.0010 U	0.0012 U	0.066 U	0.078 U	0.0010 U	0.0010 U	0.0012 U	0.068 U	0.0011 U	0.071 U	0.34 U	0.0011 UJ	1.4 U	0.71 U	0.7 U
Total CBTEX	0.0020 U	0.14 U	0.12 U	0.0021 U	0.0024 U	0.13 U	0.014 J	0.0020 U	0.0021 U	0.0024 U	0.14 U	0.0022 U	0.14 U	0.69 U	0.00066 J	2.8 U	1.4 U	1.4 U
Total CVOC	0.0099 UJ	6.6 J	7.8 J	0.00026 J	0.016	19 J	15 J	0.0021 J	0.022 J	0.0048	20 J	0.011 UJ	4.4	110 J	0.011 UJ	210	150	160
Total VOC	0.13 J	6.6 J	7.8 J	0.15 J	0.21 J	19 J	15 J	0.42 J	0.21 J	0.15 J	20 J	0.13 J	4.4	110 J	1.5 J	210	150	160

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-033	DPT-033	DPT-033	DPT-034	DPT-034	DPT-034	DPT-034	DPT-035	DPT-035	DPT-035	DPT-036	DPT-036	DPT-036	DPT-036	DPT-037	DPT-037	DPT-037	DPT-038
Sample Depth (feet bgs)	10 - 12	24 - 26	26 - 28	9 - 11	14 - 16	14 - 16	16 - 18	9 - 11	11 - 13	13 - 15	10 - 12	20 - 22	22 - 24	27 - 28	10 - 12	20 - 22	22 - 24	10 - 12
Sample Date	9/20/2019	9/20/2019	9/20/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019
Sample Type	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
1,1,1,2-Tetrachloroethane	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,1,1-Trichloroethane	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,1,2,2-Tetrachloroethane	0.00054 U	0.19 U	0.14 U	0.00050 UJ	0.00065 UJ	0.00060 UJ	0.00063 UJ	0.00051 UJ	0.063 U	0.00060 UJ	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,1,2-Trichloroethane	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,1-Dichloroethane	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,1-Dichloroethene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,1-Dichloropropene	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,2,3-Trichlorobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,2,3-Trichloropropane	0.0022 U	0.75 U	0.58 U	0.0020 UJ	0.0026 UJ	0.0024 UJ	0.0025 UJ	0.0020 UJ	0.25 U	0.0024 UJ	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,2,4-Trichlorobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,2,4-Trimethylbenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	0.83 J	1.4 U	2.6 J	0.0020 U	0.32 U	0.53 U	0.0020 U
1,2-Dibromo-3-Chloropropane	0.0032 U	1.1 U	0.87 U	0.0030 U	0.0039 U	0.0036 U	0.0038 U	0.0030 U	0.38 U	0.0036 U	0.0027 U	4.5 U	2.1 U	4.4 U	0.0030 U	0.47 U	0.8 U	0.0031 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,2-Dichlorobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,2-Dichloroethane	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,2-Dichloroethene, cis-	0.0011 U	2.3	2.6	0.0010 U	0.00034 J	0.00049 J	0.012	0.0010 U	0.51	0.04	0.00090 U	19	10	17	0.0031	3.4	5.3	0.0041 J
1,2-Dichloroethene, Total	0.0011 U	2.3	2.6	0.0010 U	0.00034 J	0.00065 J	0.014	0.0010 U	0.51	0.041 J	0.00090 U	19	10	17	0.0031	3.4	5.3	0.0041 J
1,2-Dichloroethene, trans-	0.0016 U	0.56 U	0.43 U	0.0015 U	0.0019 U	0.00016 J	0.0020	0.0015 U	0.19 U	0.0011 J	0.0014 U	2.2 U	1 U	2.2 U	0.0015 U	0.24 U	0.4 U	0.0015 U
1,2-Dichloropropane	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	0.7 J	0.0020 U	0.32 U	0.53 U	0.0020 U
1,3-Dichlorobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,3-Dichloropropane	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,3-Dichloropropene, cis-	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,3-Dichloropropene, Total	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
1,3-Dichloropropene, trans-	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
1,4-Dichlorobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
1,4-Dioxane (p-Dioxane)	0.086 U	30 UJ	23 UJ	0.08 U	0.1 U	0.096 U	0.1 U	0.081 U	10 U	0.097 U	0.072 UJ	120 UJ	56 U	120 UJ	0.079 U	13 UJ	21 UJ	0.082 UJ
2,2-Dichloropropane	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
2-Chlorotoluene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
2-Hexanone	0.011 U	3.8 U	2.9 U	0.01 U	0.013 U	0.012 U	0.013 U	0.01 U	1.2 U	0.012 U	0.0090 U	15 U	7 U	14 U	0.0099 U	1.6 U	2.6 U	0.01 U
4-Chlorotoluene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Acetone	0.37 J	3.8 U	2.9 U	0.073	0.41 J	0.033 J	0.24	0.14	1.2 U	0.091	0.48 J	15 U	7 U	14 U	0.24 J	1.6 U	2.6 U	0.058 J
Benzene	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.0022	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.043 J	0.07 J	0.00051 U
Bromobenzene	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Bromodichloromethane	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
Bromoform	0.0043 U	1.5 U	1.2 U	0.0040 U	0.0052 U	0.0048 U	0.0050 U	0.0040 U	0.5 U	0.0048 U	0.0036 U	6 U	2.8 U	5.8 U	0.0039 U	0.63 U	1.1 U	0.0041 U
Bromomethane	0.0022 UJ	0.75 UJ	0.58 UJ	0.0020 UJ	0.0026 UJ	0.0024 UJ	0.0025 UJ	0.0020 UJ	0.25 UJ	0.0024 UJ	0.0018 U	3 UJ	1.4 UJ	2.9 UJ	0.0020 U	0.32 UJ	0.53 UJ	0.0020 U
Butylbenzene, n-	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Butylbenzene, sec-	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Butylbenzene, t-	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Carbon Disulfide	0.011 U	3.8 U	2.9 U	0.01 U	0.013 U	0.012 U	0.013 U	0.01 U	1.2 U	0.012 U	0.0090 U	15 UJ	7 U	14 UJ	0.0099 U	1.6 UJ	2.6 UJ	0.01 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-033	DPT-033	DPT-033	DPT-034	DPT-034	DPT-034	DPT-034	DPT-035	DPT-035	DPT-035	DPT-036	DPT-036	DPT-036	DPT-036	DPT-037	DPT-037	DPT-037	DPT-038
Sample Depth (feet bgs)	10 - 12	24 - 26	26 - 28	9 - 11	14 - 16	14 - 16	16 - 18	9 - 11	11 - 13	13 - 15	10 - 12	20 - 22	22 - 24	27 - 28	10 - 12	20 - 22	22 - 24	10 - 12
Sample Date	9/20/2019	9/20/2019	9/20/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019
Sample Type	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
Carbon Tetrachloride	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Chlorobenzene	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00065 U	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
Chlorobromomethane	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Chloroethane	0.0022 UJ	0.75 UJ	0.58 UJ	0.0020 UJ	0.0026 UJ	0.0024 UJ	0.0025 UJ	0.0020 UJ	0.25 U	0.0024 UJ	0.0018 U	3 UJ	1.4 UJ	2.9 UJ	0.0020 U	0.32 UJ	0.53 UJ	0.0020 U
Chloroform	0.0016 U	0.56 U	0.43 U	0.0015 U	0.0019 U	0.0018 U	0.0019 U	0.0015 U	0.19 U	0.0018 U	0.0014 U	2.2 U	1 U	2.2 U	0.0015 U	0.24 U	0.4 U	0.0015 U
Chloromethane	0.0043 U	1.5 U	1.2 U	0.0040 UJ	0.0052 UJ	0.0048 UJ	0.0050 UJ	0.0040 UJ	0.5 U	0.0048 UJ	0.0036 U	6 U	2.8 U	5.8 U	0.0015 J	0.63 U	1.1 U	0.0041 U
Dibromochloromethane	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Dibromomethane (Methylene Bromide)	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Dichlorodifluoromethane	0.011 UJ	3.8 U	2.9 U	0.01 UJ	0.013 UJ	0.012 UJ	0.013 UJ	0.01 UJ	1.2 U	0.012 UJ	0.0090 U	15 U	7 UJ	14 U	0.0099 U	1.6 U	2.6 U	0.01 U
Ethylbenzene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Hexachlorobutadiene	0.0043 U	1.5 U	1.2 U	0.0040 U	0.0052 U	0.0048 U	0.0050 U	0.0040 U	0.5 U	0.0048 U	0.0036 U	6 U	2.8 U	5.8 U	0.0039 U	0.63 U	1.1 U	0.0041 U
Isopropylbenzene (Cumene)	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Methyl Ethyl Ketone (2-Butanone)	0.0040 J	3.8 U	2.9 U	0.01 UJ	0.0065 J	0.012 UJ	0.013 UJ	0.01 UJ	1.2 UJ	0.012 UJ	0.0059 J	15 U	7 U	14 U	0.0099 U	1.6 U	2.6 U	0.01 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.011 U	3.8 U	2.9 U	0.01 U	0.013 U	0.012 U	0.013 U	0.01 U	1.2 U	0.012 U	0.0090 U	15 U	7 U	14 U	0.0099 U	1.6 U	2.6 U	0.01 U
Methyl tert-butyl Ether (MTBE)	0.0022	0.75 U	0.58 U	0.00044 J	0.0026 U	0.00041 J	0.00050 J	0.00044 J	0.25 U	0.00050 J	0.0018	3 U	1.4 U	2.9 U	0.0020	0.32 U	0.53 U	0.0021
Methylene Chloride	0.0054 U	1.9 U	1.4 U	0.0050 U	0.0065 U	0.0060 U	0.0063 U	0.0051 U	0.63 U	0.0060 U	0.0045 U	7.5 U	3.5 U	7.3 U	0.0049 U	0.79 U	1.3 U	0.0051 U
Naphthalene	0.0043 U	1.5 U	1.2 U	0.0040 U	0.0052 U	0.0048 U	0.0050 U	0.0040 U	0.5 U	0.0048 U	0.0036 U	6 U	2.8 U	5.8 U	0.0039 U	0.63 U	1.1 U	0.0041 U
n-Propylbenzene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	0.32 J	0.00099 U	0.16 U	0.26 U	0.0010 U
p-Isopropyltoluene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Styrene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Tetrachloroethene	0.00054 U	0.19 U	0.14 U	0.00050 U	0.00041 J	0.00060 U	0.00063 U	0.00051 U	0.063 U	0.00060 U	0.00045 U	0.75 U	0.35 U	0.73 U	0.00049 U	0.079 U	0.13 U	0.00051 U
Toluene	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Trichloroethene	0.00054 U	57	48	0.00050 U	0.0064	0.0052	0.094	0.00040 J	16	0.00028 J	0.00026 J	340	170	280	0.048	26	48	0.011
Trichlorofluoromethane	0.0043 U	1.5 U	1.2 U	0.0040 U	0.0052 U	0.0048 U	0.0050 U	0.0040 U	0.5 U	0.0048 U	0.0036 U	6 U	2.8 U	5.8 U	0.0039 U	0.63 U	1.1 U	0.0041 U
Vinyl Acetate	0.011 U	3.8 U	2.9 U	0.01 U	0.013 U	0.012 U	0.013 U	0.01 U	1.2 U	0.012 U	0.0090 U	15 U	7 U	14 U	0.0099 U	1.6 U	2.6 U	0.01 U
Vinyl Chloride	0.0011 U	0.38 U	0.29 U	0.0010 UJ	0.0013 UJ	0.0012 UJ	0.0013 UJ	0.0010 UJ	0.12 U	0.012 J	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.076 J	0.16 J	0.0010 U
Xylene, m- & p-	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0024 U	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.32 U	0.53 U	0.0020 U
Xylene, o-	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Xylenes, Total	0.0011 U	0.38 U	0.29 U	0.0010 U	0.0013 U	0.0012 U	0.0013 U	0.0010 U	0.12 U	0.0012 U	0.00090 U	1.5 U	0.7 U	1.4 U	0.00099 U	0.16 U	0.26 U	0.0010 U
Total CBTEX	0.0022 U	0.75 U	0.58 U	0.0020 U	0.0026 U	0.0024 U	0.0025 U	0.0020 U	0.25 U	0.0022	0.0018 U	3 U	1.4 U	2.9 U	0.0020 U	0.043 J	0.07 J	0.0020 U
Total CVOC	0.011 UJ	59	51	0.01 UJ	0.0072 J	0.0059 J	0.11	0.00040 J	17	0.053 J	0.00026 J	360	180	300	0.053 J	29 J	53 J	0.015 J
Total VOC	0.38 J	59	51	0.073 J	0.42 J	0.039 J	0.35 J	0.14 J	17	0.15 J	0.49 J	360 J	180	300 J	0.29 J	30 J	54 J	0.075 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-038	DPT-038	DPT-038	DPT-039	DPT-039	DPT-039	DPT-040	DPT-040	DPT-040	DPT-040	DPT-041	DPT-041	DPT-041	DPT-042	DPT-042	DPT-042	DPT-042	DPT-043
Sample Depth (feet bgs)	10 - 12	18 - 20	24 - 26	10 - 12	18 - 20	20 - 22	10 - 12	10 - 12	17 - 19	19 - 21	10 - 12	18 - 20	20 - 22	10 - 12	16 - 18	20 - 22	26 - 28	10 - 12
Sample Date	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/24/2019	9/24/2019	9/24/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019
Sample Type	FD	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
1,1,1,2-Tetrachloroethane	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,1,1-Trichloroethane	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,1,2,2-Tetrachloroethane	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 UJ	0.00059 UJ	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,1,2-Trichloroethane	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,1-Dichloroethane	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,1-Dichloroethene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.026 J	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,1-Dichloropropene	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,2,3-Trichlorobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,2,3-Trichloropropane	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 UJ	0.0024 UJ	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,2,4-Trichlorobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,2,4-Trimethylbenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.078 J	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	2.2	1.4 U	0.0019 U
1,2-Dibromo-3-Chloropropane	0.0028 U	0.0038 U	0.37 U	0.0032 U	0.0032 U	0.0032 UJ	0.0031 U	0.0036 U	0.23 U	0.2 U	0.0027 U	0.21 U	2.1 U	0.0027 U	0.0033 U	1.1 U	2 U	0.0029 U
1,2-Dibromoethane (Ethylene Dibromide)	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,2-Dichlorobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,2-Dichloroethane	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,2-Dichloroethene, cis-	0.0024 J	0.00026 J	11	0.0025	0.043	0.073 J	0.0010 U	0.0012 U	3.8	1	0.00089 U	2.3	9.1	0.00091 U	0.0011 U	4.3	5.9	0.00096 U
1,2-Dichloroethene, Total	0.0024 J	0.00026 J	11 J	0.0025	0.043 J	0.074 J	0.00018 J	0.0012 U	3.9 J	1 J	0.00089 U	2.3 J	9.1	0.00091 U	0.0011 U	4.3	5.9	0.00096 U
1,2-Dichloroethene, trans-	0.0014 U	0.0019 U	0.032 J	0.0016 U	0.00029 J	0.00077 J	0.00018 J	0.0018 U	0.087 J	0.035 J	0.0013 U	0.01 J	1.1 U	0.0014 U	0.0016 U	0.54 U	1 U	0.0014 U
1,2-Dichloropropane	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.019 J	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.44 J	1.4 U	0.0019 U
1,3-Dichlorobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,3-Dichloropropane	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,3-Dichloropropene, cis-	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,3-Dichloropropene, Total	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
1,3-Dichloropropene, trans-	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
1,4-Dichlorobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
1,4-Dioxane (p-Dioxane)	0.076 UJ	0.1 UJ	9.8 U	0.085 UJ	0.084 UJ	0.087 UJ	0.083 U	0.095 U	6.2 U	5.4 U	0.071 U	5.7 U	57 U	0.073 U	0.087 U	29 U	55 U	0.077 U
2,2-Dichloropropane	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
2-Chlorotoluene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
2-Hexanone	0.0095 U	0.012 U	1.2 U	0.01 U	0.01 U	0.011 UJ	0.01 U	0.012 U	0.78 U	0.68 U	0.0089 U	0.71 U	7.1 U	0.0091 U	0.011 U	3.6 U	6.8 U	0.0096 U
4-Chlorotoluene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Acetone	0.48 J	0.44 J	1.2 U	0.4 J	0.48 J	0.9 J	0.042 J	0.15 J	0.78 U	0.68 U	0.36 J	0.71 U	7.1 U	0.16 J	0.25 J	3.6 U	6.8 U	0.26 J
Benzene	0.00048 U	0.00063 U	0.024 J	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.027 J	0.36 U	0.00046 U	0.00054 U	0.12 J	0.15 J	0.00048 U
Bromobenzene	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Bromodichloromethane	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
Bromoform	0.0038 U	0.0050 U	0.49 U	0.0042 U	0.0042 U	0.0043 UJ	0.0042 U	0.0047 U	0.31 U	0.27 U	0.0036 U	0.28 U	2.8 U	0.0036 U	0.0044 U	1.4 U	2.7 U	0.0038 U
Bromomethane	0.0019 U	0.0025 U	0.24 UJ	0.0021 UJ	0.0021 UJ	0.0022 UJ	0.0021 UJ	0.0024 UJ	0.16 UJ	0.14 UJ	0.0018 UJ	0.14 UJ	1.4 UJ	0.0018 UJ	0.0022 UJ	0.72 UJ	1.4 UJ	0.0019 UJ
Butylbenzene, n-	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Butylbenzene, sec-	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Butylbenzene, t-	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Carbon Disulfide	0.0095 U	0.012 UJ	1.2 U	0.01 UJ	0.01 UJ	0.011 UJ	0.01 U	0.012 U	0.78 U	0.68 U	0.0089 U	0.71 U	7.1 U	0.0091 U	0.011 U	3.6 U	6.8 U	0.0096 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-038	DPT-038	DPT-038	DPT-039	DPT-039	DPT-039	DPT-040	DPT-040	DPT-040	DPT-040	DPT-041	DPT-041	DPT-041	DPT-042	DPT-042	DPT-042	DPT-042	DPT-043
Sample Depth (feet bgs)	10 - 12	18 - 20	24 - 26	10 - 12	18 - 20	20 - 22	10 - 12	10 - 12	17 - 19	19 - 21	10 - 12	18 - 20	20 - 22	10 - 12	16 - 18	20 - 22	26 - 28	10 - 12
Sample Date	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/19/2019	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/24/2019	9/24/2019	9/24/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019
Sample Type	FD	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
Carbon Tetrachloride	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Chlorobenzene	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.039 U	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
Chlorobromomethane	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Chloroethane	0.0019 U	0.0025 UJ	0.24 UJ	0.0021 UJ	0.0021 UJ	0.0022 UJ	0.0021 UJ	0.0024 UJ	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 UJ	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 UJ
Chloroform	0.0014 U	0.0019 U	0.18 U	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.0018 U	0.12 U	0.1 U	0.0013 U	0.011 J	0.11 J	0.0014 U	0.0016 U	0.54 U	1 U	0.0014 U
Chloromethane	0.0012 J	0.0017 J	0.49 U	0.0016 J	0.0018 J	0.0018 J	0.0042 UJ	0.0047 UJ	0.31 U	0.27 U	0.0036 U	0.28 U	2.8 U	0.0036 U	0.0044 U	1.4 U	2.7 U	0.0038 U
Dibromochloromethane	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Dibromomethane (Methylene Bromide)	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Dichlorodifluoromethane	0.0095 U	0.012 U	1.2 UJ	0.01 U	0.01 U	0.011 UJ	0.01 UJ	0.012 UJ	0.78 U	0.68 U	0.0089 U	0.71 U	7.1 U	0.0091 U	0.011 U	3.6 U	6.8 U	0.0096 U
Ethylbenzene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.037 J	0.02 J	0.00089 U	0.071 U	0.12 J	0.00091 U	0.0011 U	0.051 J	0.68 U	0.00096 U
Hexachlorobutadiene	0.0038 U	0.0050 U	0.49 U	0.0042 U	0.0042 U	0.0043 UJ	0.0042 U	0.0047 U	0.31 U	0.27 U	0.0036 U	0.28 U	2.8 U	0.0036 U	0.0044 U	1.4 U	2.7 U	0.0038 U
Isopropylbenzene (Cumene)	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.011 J	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Methyl Ethyl Ketone (2-Butanone)	0.0095 U	0.012 U	1.2 U	0.01 U	0.01 U	0.017 J	0.01 UJ	0.012 UJ	0.78 UJ	0.68 UJ	0.0055 J	0.71 U	7.1 U	0.0091 U	0.0031 J	3.6 U	6.8 U	0.0033 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0095 U	0.012 U	1.2 U	0.01 U	0.01 U	0.011 UJ	0.01 U	0.012 U	0.78 U	0.68 U	0.0089 U	0.71 U	7.1 U	0.0091 U	0.011 U	3.6 U	6.8 U	0.0096 U
Methyl tert-butyl Ether (MTBE)	0.0024	0.0022 J	0.24 U	0.0028	0.0020 J	0.0029 J	0.00034 J	0.00048 J	0.16 U	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.72 U	1.4 U	0.0019 U
Methylene Chloride	0.0048 U	0.0063 U	0.61 U	0.0053 U	0.0053 U	0.0025 J	0.0052 U	0.0059 U	0.39 U	0.34 U	0.0044 U	0.35 U	3.6 U	0.0046 U	0.0054 U	1.8 U	3.4 U	0.0048 U
Naphthalene	0.0038 U	0.0050 U	0.49 U	0.0042 U	0.0042 U	0.0043 UJ	0.0042 U	0.0047 U	0.31 U	0.27 U	0.0036 U	0.28 U	2.8 U	0.0036 U	0.0044 U	1.4 U	2.7 U	0.0038 U
n-Propylbenzene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.019 J	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.16 J	0.68 U	0.00096 U
p-Isopropyltoluene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Styrene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.36 U	0.68 U	0.00096 U
Tetrachloroethene	0.00048 U	0.00063 U	0.061 U	0.00053 U	0.00053 U	0.00054 UJ	0.00052 U	0.00059 U	0.64	0.034 U	0.00044 U	0.035 U	0.36 U	0.00046 U	0.00054 U	0.18 U	0.34 U	0.00048 U
Toluene	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.078 U	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.27 J	0.68 U	0.00096 U
Trichloroethene	0.0085	0.00028 J	26	0.0090	0.0038	0.0050 J	0.00016 J	0.00020 J	2.2	0.057	0.00044 U	3	120	0.00046 U	0.00054 U	55	88	0.00064
Trichlorofluoromethane	0.0038 U	0.0050 U	0.49 U	0.0042 U	0.0042 U	0.0043 UJ	0.0042 U	0.0047 U	0.31 U	0.27 U	0.0036 U	0.28 U	2.8 U	0.0036 U	0.0044 U	1.4 U	2.7 U	0.0038 U
Vinyl Acetate	0.0095 U	0.012 U	1.2 U	0.01 U	0.01 U	0.011 UJ	0.01 U	0.012 U	0.78 U	0.68 U	0.0089 U	0.71 U	7.1 U	0.0091 U	0.011 U	3.6 U	6.8 U	0.0096 U
Vinyl Chloride	0.00095 U	0.0012 U	0.095 J	0.0010 U	0.00054 J	0.0011 UJ	0.0010 UJ	0.0012 UJ	0.034 J	0.068 U	0.00089 U	0.068 J	0.71 U	0.00091 U	0.0011 U	0.39	0.64 J	0.00096 U
Xylene, m- & p-	0.0019 U	0.0025 U	0.24 U	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.071 J	0.14 U	0.0018 U	0.14 U	1.4 U	0.0018 U	0.0022 U	0.26 J	1.4 U	0.0019 U
Xylene, o-	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.029 J	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.14 J	0.68 U	0.00096 U
Xylenes, Total	0.00095 U	0.0012 U	0.12 U	0.0010 U	0.0010 U	0.0011 UJ	0.0010 U	0.0012 U	0.1 J	0.068 U	0.00089 U	0.071 U	0.71 U	0.00091 U	0.0011 U	0.4 J	0.68 U	0.00096 U
Total CBTEX	0.0019 U	0.0025 U	0.024 J	0.0021 U	0.0021 U	0.0022 UJ	0.0021 U	0.0024 U	0.15 J	0.02 J	0.0018 U	0.027 J	0.12 J	0.0018 U	0.0022 U	0.84 J	0.15 J	0.0019 U
Total CVOC	0.012 J	0.0022 J	37 J	0.013 J	0.049 J	0.083 J	0.00034 J	0.00020 J	6.8 J	1.1 J	0.0089 U	5.4 J	130 J	0.0091 U	0.011 U	60	95 J	0.00064
Total VOC	0.49 J	0.44 J	37 J	0.42 J	0.53 J	1 J	0.043 J	0.15 J	7 J	1.1 J	0.37 J	5.4 J	130 J	0.16 J	0.25 J	63 J	95 J	0.26 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-043	DPT-043	DPT-043	DPT-044	DPT-044	DPT-044	DPT-044	DPT-045	DPT-045	DPT-045	DPT-045	DPT-046	DPT-046	DPT-046	DPT-047	DPT-047	DPT-047	DPT-047
Sample Depth (feet bgs)	18 - 20	18 - 20	22 - 24	10 - 12	14 - 16	16 - 18	16 - 18	10 - 12	17 - 19	22 - 24	27 - 28	10 - 12	18 - 20	20 - 22	11 - 13	11 - 13	18 - 20	24 - 26
Sample Date	9/25/2019	9/25/2019	9/25/2019	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019
Sample Type	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,1,1-Trichloroethane	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,1,2,2-Tetrachloroethane	0.00055 U	0.00053 U	0.00055 U	0.00054 UJ	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,1,2-Trichloroethane	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,1-Dichloroethane	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,1-Dichloroethene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,1-Dichloropropene	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,2,3-Trichlorobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,2,3-Trichloropropane	0.0022 U	0.0021 U	0.0022 U	0.0021 UJ	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,2,4-Trichlorobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 UJ	0.25 UJ	0.29 UJ	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,2,4-Trimethylbenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.032 J	4.8 J	10 J	0.0022 U	0.0023 U	0.69 U	19	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,2-Dibromo-3-Chloropropane	0.0033 U	0.0032 U	0.0033 U	0.0032 U	0.21 U	0.38 U	0.43 U	0.0033 U	0.0035 U	1 U	10 U	0.0028 U	0.0033 U	0.44 U	0.0030 U	0.0031 U	0.0033 U	0.0036 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,2-Dichlorobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,2-Dichloroethane	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,2-Dichloroethene, cis-	0.0011 U	0.0011 U	0.0011 U	0.0033	0.35	12	17	0.0011 U	0.0012 U	15	39	0.00094 U	0.0011 U	1.9	0.0010 U	0.0010 U	0.0011 U	0.00056 J
1,2-Dichloroethene, Total	0.0011 U	0.0011 U	0.0011 U	0.0033	0.35	12 J	17 J	0.0011 U	0.0012 U	15	39	0.00094 U	0.0011 U	1.9	0.0010 U	0.0010 U	0.0011 U	0.00074 J
1,2-Dichloroethene, trans-	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.1 U	0.056 J	0.088 J	0.0016 U	0.0017 U	0.52 U	5.1 U	0.0014 U	0.0016 U	0.22 U	0.0015 U	0.0015 U	0.0016 U	0.00018 J
1,2-Dichloropropane	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 UJ	0.13 UJ	0.14 UJ	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.24 J	0.22 J	0.0022 U	0.0023 U	0.69 U	4.7 J	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,3-Dichlorobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,3-Dichloropropane	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,3-Dichloropropene, cis-	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,3-Dichloropropene, Total	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
1,3-Dichloropropene, trans-	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
1,4-Dichlorobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
1,4-Dioxane (p-Dioxane)	0.088 U	0.085 U	0.088 U	0.086 U	5.6 U	10 U	11 U	0.088 U	0.093 U	28 U	270 U	0.075 U	0.088 U	12 U	0.08 U	0.082 U	0.088 U	0.096 U
2,2-Dichloropropane	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
2-Chlorotoluene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
2-Hexanone	0.011 U	0.011 U	0.011 U	0.011 U	0.7 U	1.3 U	1.4 U	0.011 U	0.012 U	3.5 U	34 U	0.0094 U	0.011 U	1.5 U	0.01 U	0.01 U	0.011 U	0.012 U
4-Chlorotoluene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Acetone	0.011 U	0.29 J	0.36 J	0.26	0.7 U	1.3 U	1.4 U	0.84 J	0.71 J	3.5 U	34 U	0.41 J	0.51 J	1.5 U	0.19 J	0.96 J	0.53 J	0.57 J
Benzene	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.059 J	0.00050 U	0.00051 U	0.00055 U	0.0094
Bromobenzene	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Bromodichloromethane	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
Bromoform	0.0044 U	0.0042 U	0.0044 U	0.0043 U	0.28 U	0.51 U	0.57 U	0.0044 U	0.0046 U	1.4 U	14 U	0.0038 U	0.0044 U	0.59 U	0.0040 U	0.0041 U	0.0044 U	0.0048 U
Bromomethane	0.0022 UJ	0.0021 UJ	0.0022 UJ	0.0021 UJ	0.14 UJ	0.25 UJ	0.29 UJ	0.0022 UJ	0.0023 UJ	0.69 UJ	6.8 UJ	0.0019 UJ	0.0022 UJ	0.3 UJ	0.0020 UJ	0.0020 UJ	0.0022 UJ	0.0024 UJ
Butylbenzene, n-	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.063 J	0.13	0.18	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Butylbenzene, sec-	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.14	0.12 J	0.15	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Butylbenzene, t-	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.0096 J	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Carbon Disulfide	0.011 U	0.011 U	0.011 U	0.011 U	0.7 U	1.3 U	1.4 U	0.011 U	0.012 U	3.5 U	34 U	0.0094 U	0.011 U	1.5 U	0.01 U	0.01 U	0.011 U	0.012 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-043	DPT-043	DPT-043	DPT-044	DPT-044	DPT-044	DPT-044	DPT-045	DPT-045	DPT-045	DPT-045	DPT-046	DPT-046	DPT-046	DPT-047	DPT-047	DPT-047	DPT-047
Sample Depth (feet bgs)	18 - 20	18 - 20	22 - 24	10 - 12	14 - 16	16 - 18	16 - 18	10 - 12	17 - 19	22 - 24	27 - 28	10 - 12	18 - 20	20 - 22	11 - 13	11 - 13	18 - 20	24 - 26
Sample Date	9/25/2019	9/25/2019	9/25/2019	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019	9/24/2019
Sample Type	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	FD	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Chlorobenzene	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.063 U	0.072 U	0.00055 U	0.00058 U	0.17 U	1.7 U	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
Chlorobromomethane	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Chloroethane	0.0022 UJ	0.0021 UJ	0.0022 UJ	0.0021 UJ	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Chloroform	0.0016 U	0.0016 U	0.0016 U	0.0016 U	0.1 U	0.19 U	0.21 U	0.0016 U	0.0017 U	0.52 U	5.1 U	0.0014 U	0.0016 U	0.22 U	0.0015 U	0.0015 U	0.0016 U	0.0018 U
Chloromethane	0.0044 U	0.0042 U	0.0044 U	0.0043 UJ	0.28 U	0.51 U	0.57 U	0.0044 U	0.0046 U	1.4 U	14 U	0.0038 U	0.0044 U	0.59 U	0.0040 U	0.0041 U	0.0044 U	0.0048 U
Dibromochloromethane	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14 U	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Dibromomethane (Methylene Bromide)	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.25 U	0.29 U	0.0022 U	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Dichlorodifluoromethane	0.011 U	0.011 U	0.011 U	0.011 UJ	0.7 U	1.3 U	1.4 U	0.011 U	0.012 U	3.5 U	34 U	0.0094 U	0.011 U	1.5 U	0.01 U	0.01 U	0.011 U	0.012 U
Ethylbenzene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.048 J	0.056 J	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Hexachlorobutadiene	0.0044 U	0.0042 U	0.0044 U	0.0043 U	0.28 U	0.51 U	0.57 U	0.0044 U	0.0046 U	1.4 U	14 U	0.0038 U	0.0044 U	0.59 U	0.0040 U	0.0041 U	0.0044 U	0.0048 U
Isopropylbenzene (Cumene)	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.18	0.11 J	0.12 J	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Methyl Ethyl Ketone (2-Butanone)	0.011 U	0.0030 J	0.0042 J	0.0045 J	0.7 UJ	1.3 UJ	1.4 UJ	0.014	0.0086 J	3.5 U	34 U	0.0062 J	0.0054 J	1.5 U	0.0031 J	0.014 J	0.0055 J	0.0070 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.011 U	0.011 U	0.011 U	0.011 U	0.7 U	1.3 U	1.4 U	0.011 U	0.012 U	3.5 U	34 U	0.0094 U	0.011 U	1.5 U	0.01 U	0.01 U	0.011 U	0.012 U
Methyl tert-butyl Ether (MTBE)	0.0022 U	0.0021 U	0.0022 U	0.0025	0.14 U	0.25 U	0.29 U	0.0015 J	0.0027	0.69 U	6.8 U	0.0028	0.0022	0.3 U	0.0023	0.0034	0.0029	0.0031
Methylene Chloride	0.0055 U	0.0053 U	0.0055 U	0.0054 U	0.35 U	0.63 U	0.72 U	0.0055 U	0.0058 U	1.7 U	17 U	0.0047 U	0.0055 U	0.74 U	0.0050 U	0.0051 U	0.0055 U	0.0060 U
Naphthalene	0.0044 U	0.0042 U	0.0044 U	0.0043 U	0.28 U	0.51 U	0.57 U	0.0044 U	0.0046 U	1.4 U	14 U	0.0038 U	0.0044 U	0.59 U	0.0040 U	0.0041 U	0.0044 U	0.0048 U
n-Propylbenzene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.018 J	0.98 J	1.8 J	0.0011 U	0.0012 U	0.35 U	1.7 J	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
p-Isopropyltoluene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.1 J	0.12 J	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Styrene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 UJ	0.13 UJ	0.14 UJ	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Tetrachloroethene	0.00055 U	0.00053 U	0.00055 U	0.00054 U	0.035 U	0.12	0.079	0.00055 U	0.00058 U	0.17 U	2.5	0.00047 U	0.00055 U	0.074 U	0.00050 U	0.00051 U	0.00055 U	0.00060 U
Toluene	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 UJ	0.13 UJ	0.14 UJ	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.16	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Trichloroethene	0.00055 U	0.00053 U	0.00055 U	0.0058	0.035 U	16	12	0.00055 U	0.00058 U	47	560	0.00047 U	0.00055 U	20	0.00050 U	0.00051 U	0.00055 U	0.00060 U
Trichlorofluoromethane	0.0044 U	0.0042 U	0.0044 U	0.0043 U	0.28 U	0.51 U	0.57 U	0.0044 U	0.0046 U	1.4 U	14 U	0.0038 U	0.0044 U	0.59 U	0.0040 U	0.0041 U	0.0044 U	0.0048 U
Vinyl Acetate	0.011 U	0.011 U	0.011 U	0.011 U	0.7 U	1.3 U	1.4 U	0.011 U	0.012 U	3.5 U	34 U	0.0094 U	0.011 U	1.5 U	0.01 U	0.01 U	0.011 U	0.012 U
Vinyl Chloride	0.0011 U	0.0011 U	0.019	0.0011 UJ	0.07 U	0.078 J	0.073 J	0.0011 U	0.0017	0.22 J	3.4 U	0.00094 U	0.0014	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.05
Xylene, m- & p-	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.14 U	0.097 J	0.088 J	0.0012 J	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.3 U	0.0020 U	0.0020 U	0.0022 U	0.0024 U
Xylene, o-	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.13 U	0.14	0.0011 U	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Xylenes, Total	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.07 U	0.097 J	0.23 J	0.0012 J	0.0012 U	0.35 U	3.4 U	0.00094 U	0.0011 U	0.15 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U
Total CBTEX	0.0022 U	0.0021 U	0.0022 U	0.0021 U	0.18	0.26 J	0.4 J	0.0012 J	0.0023 U	0.69 U	6.8 U	0.0019 U	0.0022 U	0.22 J	0.0020 U	0.0020 U	0.0022 U	0.0094
Total CVOC	0.011 UJ	0.011 UJ	0.019	0.0091	0.35	28 J	29 J	0.011 U	0.0017	62 J	600	0.0094 U	0.0014	22	0.01 U	0.01 U	0.011 U	0.051 J
Total VOC	0.088 UJ	0.29 J	0.38 J	0.28 J	0.79 J	35 J	42 J	0.86 J	0.72 J	62 J	630 J	0.42 J	0.52 J	22 J	0.2 J	0.98 J	0.54 J	0.64 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-048	DPT-048	DPT-048	DPT-048	DPT-049	DPT-049	DPT-049	DPT-050	DPT-050	DPT-050	DPT-050	DPT-066	DPT-066	DPT-066	DPT-066	DPT-066	DPT-066	DPT-067
Sample Depth (feet bgs)	10 - 12	18 - 20	20 - 22	27 - 29	8 - 9	14 - 16	19 - 21	10 - 12	18 - 20	22 - 24	27 - 28	2 - 3	22 - 23	29 - 30	33 - 34	35 - 36	47 - 48	4 - 5
Sample Date	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
1,1,1,2-Tetrachloroethane	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
1,1,1-Trichloroethane	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
1,1,2,2-Tetrachloroethane	0.00052 UJ	3.6 U	0.076 UJ	0.064 UJ	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
1,1,2-Trichloroethane	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,1-Dichloroethane	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 U	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,1-Dichloroethene	0.0010 U	7.1 U	0.072 J	0.049 J	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 U	0.66 U	0.3 J	0.06 J	0.0010 U	0.00089 U
1,1-Dichloropropene	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
1,2,3-Trichlorobenzene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,2,3-Trichloropropane	0.0021 UJ	14 U	0.3 UJ	0.26 UJ	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,2,4-Trichlorobenzene	0.0021 U	14 UJ	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,2,4-Trimethylbenzene	0.0021 U	3.7 J	2.4	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	3.4	0.00050 J	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,2-Dibromo-3-Chloropropane	0.0031 U	21 U	0.46 U	0.38 U	0.0030 U	0.0033 U	0.8 U	0.0029 U	0.0035 U	0.44 U	0.21 U	0.0032 U	0.0030 UJ	2 U	2 U	0.21 U	0.0030 UJ	0.0027 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,2-Dichlorobenzene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,2-Dichloroethane	0.0010 U	7.1 U	0.15 U	0.037 J	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 U	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,2-Dichloroethene, cis-	0.0010	26	14	0.56	0.00099 U	0.0011 U	10	0.00096 U	0.0012 U	1.4	1	0.0011 U	0.0010 U	25	53	11	0.00023 J	0.00089 U
1,2-Dichloroethene, Total	0.0010	26	14 J	0.61 J	0.00056 J	0.00029 J	10 J	0.00028 J	0.00021 J	1.4	1	0.0016 U	0.0015 U	25	53	11	0.00023 J	0.0013 U
1,2-Dichloroethene, trans-	0.0016 U	11 U	0.049 J	0.052 J	0.00056 J	0.00029 J	0.051 J	0.00028 J	0.00021 J	0.22 U	0.1 U	0.0016 U	0.0015 U	0.99 U	0.17 J	0.048 J	0.0015 U	0.0013 U
1,2-Dichloropropane	0.0010 U	7.1 UJ	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 U	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0021 U	14 U	0.56	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	1	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,3-Dichlorobenzene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,3-Dichloropropane	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
1,3-Dichloropropene, cis-	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
1,3-Dichloropropene, Total	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
1,4-Dichlorobenzene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
1,4-Dioxane (p-Dioxane)	0.083 U	570 U	12 U	10 U	0.08 U	0.089 U	21 U	0.077 U	0.093 U	12 U	5.6 U	0.086 U	0.081 U	53 U	55 U	5.7 U	0.081 U	0.071 U
2,2-Dichloropropane	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
2-Chlorotoluene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
2-Hexanone	0.01 U	71 U	1.5 U	1.3 U	0.0099 U	0.011 U	2.6 U	0.0096 U	0.012 U	1.5 U	0.7 U	0.011 U	0.01 UJ	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
4-Chlorotoluene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
Acetone	0.18	71 U	1.5 U	1.3 U	0.29 J	0.35 J	2.6 U	0.26 J	0.44 J	1.5 U	0.7 U	0.073	0.0060 J	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
Benzene	0.00052 U	3.6 U	0.076 U	0.21	0.00050 U	0.00026 J	0.23	0.00048 U	0.00058 U	0.18	0.049	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
Bromobenzene	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
Bromodichloromethane	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
Bromoform	0.0042 U	28 U	0.61 U	0.51 U	0.0040 U	0.0044 U	1.1 U	0.0038 U	0.0046 U	0.59 U	0.28 U	0.0043 U	0.0040 UJ	2.6 U	2.7 U	0.28 U	0.0040 UJ	0.0036 U
Bromomethane	0.0021 UJ	14 UJ	0.3 UJ	0.26 UJ	0.0020 UJ	0.0022 UJ	0.53 UJ	0.0019 UJ	0.0023 UJ	0.3 UJ	0.14 UJ	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Butylbenzene, n-	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 UJ	0.00089 U
Butylbenzene, sec-	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.033 J	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 UJ	0.00089 U
Butylbenzene, t-	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.00014 J	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 UJ	0.0018 U
Carbon Disulfide	0.01 U	71 U	1.5 U	1.3 U	0.0099 U	0.011 U	2.6 U	0.0096 U	0.012 U	1.5 U	0.7 U	0.011 U	0.01 U	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-048	DPT-048	DPT-048	DPT-048	DPT-049	DPT-049	DPT-049	DPT-050	DPT-050	DPT-050	DPT-050	DPT-066	DPT-066	DPT-066	DPT-066	DPT-066	DPT-066	DPT-067
Sample Depth (feet bgs)	10 - 12	18 - 20	20 - 22	27 - 29	8 - 9	14 - 16	19 - 21	10 - 12	18 - 20	22 - 24	27 - 28	2 - 3	22 - 23	29 - 30	33 - 34	35 - 36	47 - 48	4 - 5
Sample Date	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	9/23/2019	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel
Analyte																		
Carbon Tetrachloride	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 U	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Chlorobenzene	0.00052 U	3.6 U	0.076 U	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
Chlorobromomethane	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Chloroethane	0.0021 UJ	14 U	0.3 UJ	0.26 UJ	0.0020 UJ	0.0022 UJ	0.53 UJ	0.0019 UJ	0.0023 UJ	0.3 UJ	0.14 UJ	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Chloroform	0.0016 U	11 U	0.23 U	0.19 U	0.0015 U	0.0017 U	0.4 U	0.0014 U	0.0017 U	0.22 U	0.1 U	0.0016 U	0.0015 U	0.99 U	1 U	0.11 U	0.0015 U	0.0013 U
Chloromethane	0.0042 UJ	28 U	0.61 UJ	0.51 UJ	0.0040 U	0.0044 U	1.1 U	0.0038 U	0.0046 U	0.59 U	0.28 U	0.0043 U	0.0040 U	2.6 U	2.7 U	0.28 U	0.0040 U	0.0036 U
Dibromochloromethane	0.0010 U	7.1 U	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Dibromomethane (Methylene Bromide)	0.0021 U	14 U	0.3 U	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Dichlorodifluoromethane	0.01 UJ	71 U	1.5 UJ	1.3 UJ	0.0099 U	0.011 U	2.6 U	0.0096 U	0.012 U	1.5 U	0.7 U	0.011 U	0.01 U	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
Ethylbenzene	0.0010 U	7.1 U	0.082 J	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.022 J	0.02 J	0.0010 J	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Hexachlorobutadiene	0.0042 U	28 U	0.61 U	0.51 U	0.0040 U	0.0044 U	1.1 U	0.0038 U	0.0046 U	0.59 U	0.28 U	0.0043 U	0.0040 UJ	2.6 U	2.7 U	0.28 U	0.0040 UJ	0.0036 U
Isopropylbenzene (Cumene)	0.0010 U	7.1 U	0.027 J	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.03 J	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 UJ	0.00089 U
Methyl Ethyl Ketone (2-Butanone)	0.0040 J	71 UJ	1.5 UJ	1.3 UJ	0.0071 J	0.0048 J	2.6 U	0.0067 J	0.0050 J	1.5 U	0.7 U	0.011 U	0.01 U	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.01 U	71 U	1.5 U	1.3 U	0.0099 U	0.011 U	2.6 U	0.0096 U	0.012 U	1.5 U	0.7 U	0.011 U	0.01 UJ	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
Methyl tert-butyl Ether (MTBE)	0.0024	14 U	0.3 U	0.26 U	0.0020	0.0013 J	0.53 U	0.0018 J	0.0016 J	0.3 U	0.14 U	0.0021 U	0.0020 U	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Methylene Chloride	0.0052 U	36 U	0.36 J	0.29 J	0.0050 U	0.0056 U	1.3 U	0.0048 U	0.0058 U	0.74 U	0.35 U	0.0054 U	0.0051 U	3.3 U	3.4 U	0.36 U	0.0050 U	0.0045 U
Naphthalene	0.0042 U	28 U	0.61 U	0.51 U	0.00074 J	0.0044 U	1.1 U	0.0038 U	0.0046 U	0.59 U	0.28 U	0.0043 U	0.0040 UJ	2.6 U	2.7 U	0.28 U	0.0040 UJ	0.0036 U
n-Propylbenzene	0.0010 U	7.1 U	0.24	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.87	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 UJ	0.00089 U
p-Isopropyltoluene	0.0010 U	7.1 U	0.017 J	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.044 J	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 UJ	0.00089 U
Styrene	0.0010 U	7.1 UJ	0.15 U	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Tetrachloroethene	0.00052 U	3.6 U	1.1	0.064 U	0.00050 U	0.00056 U	0.13 U	0.00048 U	0.00058 U	0.074 U	0.035 U	0.00054 U	0.00051 U	0.33 U	0.34 U	0.036 U	0.00050 U	0.00045 U
Toluene	0.0010 U	7.1 UJ	0.13 J	0.13 U	0.00099 U	0.0011 U	0.55	0.00096 U	0.0012 U	0.086 J	0.07 U	0.0011 U	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Trichloroethene	0.0017	1300	500	0.99	0.00067	0.00056 U	39	0.00023 J	0.00058 U	18	4.5	0.00054 U	0.00051 U	260	290	0.75	0.0011	0.00045 U
Trichlorofluoromethane	0.0042 U	28 U	0.61 U	0.51 U	0.0040 U	0.0044 U	1.1 U	0.0038 U	0.0046 U	0.59 U	0.28 U	0.0043 U	0.0040 U	2.6 U	2.7 U	0.28 U	0.0040 U	0.0036 U
Vinyl Acetate	0.01 U	71 U	1.5 U	1.3 U	0.0099 U	0.011 U	2.6 U	0.0096 U	0.012 U	1.5 U	0.7 U	0.011 U	0.01 U	6.6 U	6.9 U	0.71 U	0.01 U	0.0089 U
Vinyl Chloride	0.0010 UJ	7.1 U	0.64 J	0.13 UJ	0.00099 U	0.0011 U	0.18 J	0.00096 U	0.00054 J	0.15 U	0.031 J	0.0011 U	0.0010 U	0.41 J	0.45 J	0.14 J	0.0010 U	0.00089 U
Xylene, m- & p-	0.0021 U	14 U	0.43	0.26 U	0.0020 U	0.0022 U	0.53 U	0.0019 U	0.0023 U	0.3 U	0.14 U	0.0054	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Xylene, o-	0.0010 U	7.1 U	0.2	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0018	0.0010 UJ	0.66 U	0.69 U	0.071 U	0.0010 U	0.00089 U
Xylenes, Total	0.0010 U	7.1 U	0.63	0.13 U	0.00099 U	0.0011 U	0.26 U	0.00096 U	0.0012 U	0.15 U	0.07 U	0.0072	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Total CBTEX	0.0021 U	14 UJ	0.87 J	0.21	0.0020 U	0.00026 J	0.78	0.0019 U	0.0023 U	0.29 J	0.099 J	0.0082 J	0.0020 UJ	1.3 U	1.4 U	0.14 U	0.0020 U	0.0018 U
Total CVOC	0.0027	1300	520 J	2 J	0.0012 J	0.00029 J	49 J	0.00051 J	0.00075 J	19	5.5 J	0.0011 U	0.0010 U	285.41	343.92	11.998	0.00133	0.00089 U
Total VOC	0.19 J	1300 J	520 J	2.2 J	0.3 J	0.36 J	50 J	0.27 J	0.45 J	20 J	11 J	0.0817	0.006	285.41	343.92	11.998	0.00133	0.0089 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-067	DPT-067	DPT-067	DPT-067	DPT-067	DPT-067	DPT-068	DPT-068	DPT-068	DPT-068	DPT-068	DPT-068	DPT-069	DPT-069	DPT-069	DPT-069	DPT-069	DPT-069
Sample Depth (feet bgs)	26 - 27	30 - 31	30 - 31	36 - 37	42 - 43	44 - 45	2 - 3	2 - 3	28 - 29	32 - 33	35 - 36	39 - 40	5 - 6	22 - 23	28 - 29	31 - 32	38 - 39	42.5 - 43.5
Sample Date	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022
Sample Type	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
1,1,1-Trichloroethane	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
1,1,2,2-Tetrachloroethane	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
1,1,2-Trichloroethane	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,1-Dichloroethane	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,1-Dichloroethene	0.15 U	0.076 U	0.034 J	0.00098 U	0.024 J	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.15	0.076	0.0011 U	0.00089 U
1,1-Dichloropropene	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
1,2,3-Trichlorobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,2,3-Trichloropropane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,2,4-Trichlorobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,2,4-Trimethylbenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,2-Dibromo-3-Chloropropane	0.46 U	0.23 U	0.22 U	0.0029 U	0.22 U	0.0032 U	0.0034 U	0.0032 U	0.22 U	0.21 U	0.0029 U	0.0029 U	0.0028 U	0.0033 U	0.18 U	0.2 U	0.0032 U	0.0027 U
1,2-Dibromoethane (Ethylene Dibromide)	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,2-Dichlorobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,2-Dichloroethane	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,2-Dichloroethene, cis-	8.3	26	30	0.022	9.3	0.0026	0.00044 U	0.0010 U	0.43 J	10	0.0026 U	0.00052 U	0.00019 U	0.0037 U	23	6.9	0.00039 U	0.00089 U
1,2-Dichloroethene, Total	8.3	26.3	30.5	0.022	9.3	0.0034	0.0017 U	0.0016 U	0.43 J	10	0.0026 U	0.0014 U	0.0014 U	0.0037 U	23	6.9	0.0016 U	0.0013 U
1,2-Dichloroethene, trans-	0.024 J	0.32	0.48	0.00036 J	0.066 J	0.00079 J	0.0017 U	0.0016 U	0.11 U	0.02 J	0.0015 U	0.0014 U	0.0014 U	0.0017 U	0.051 J	0.041 J	0.0016 U	0.0013 U
1,2-Dichloropropane	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,3,5-Trimethylbenzene (Mesitylene)	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,3-Dichlorobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,3-Dichloropropane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,3-Dichloropropene, cis-	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
1,4-Dichlorobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
1,4-Dioxane (p-Dioxane)	12 U	6.1 U	5.8 U	0.078 U	5.9 U	0.085 U	0.091 U	0.085 U	5.8 U	5.7 U	0.078 U	0.078 U	0.075 U	0.089 U	4.9 U	5.4 U	0.085 U	0.071 U
2,2-Dichloropropane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
2-Chlorotoluene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
2-Hexanone	1.5 U	0.76 U	0.72 U	0.0098 U	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
4-Chlorotoluene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Acetone	1.5 U	0.76 U	0.72 U	0.0074 J	0.74 U	0.0054 J	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
Benzene	0.12	0.038 U	0.036 U	0.029	0.24	0.00039 J	0.00057 U	0.00053 U	0.036 U	0.04	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.013 J	0.034 U	0.00053 U	0.00044 U
Bromobenzene	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Bromodichloromethane	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
Bromoform	0.62 U	0.3 U	0.29 U	0.0039 U	0.3 U	0.0042 U	0.0046 U	0.0042 U	0.29 U	0.29 U	0.0039 U	0.0039 U	0.0038 U	0.0045 U	0.25 U	0.27 U	0.0043 U	0.0036 U
Bromomethane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Butylbenzene, n-	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Butylbenzene, sec-	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Butylbenzene, t-	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Carbon Disulfide	1.5 U	0.76 U	0.72 U	0.0061 J	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-067	DPT-067	DPT-067	DPT-067	DPT-067	DPT-067	DPT-068	DPT-068	DPT-068	DPT-068	DPT-068	DPT-068	DPT-069	DPT-069	DPT-069	DPT-069	DPT-069	DPT-069
Sample Depth (feet bgs)	26 - 27	30 - 31	30 - 31	36 - 37	42 - 43	44 - 45	2 - 3	2 - 3	28 - 29	32 - 33	35 - 36	39 - 40	5 - 6	22 - 23	28 - 29	31 - 32	38 - 39	42.5 - 43.5
Sample Date	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/11/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022
Sample Type	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Chlorobenzene	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
Chlorobromomethane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Chloroethane	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Chloroform	0.23 U	0.11 U	0.11 U	0.0015 U	0.11 U	0.0016 U	0.0017 U	0.0016 U	0.11 U	0.11 U	0.0015 U	0.0014 U	0.0014 U	0.0017 U	0.093 U	0.1 U	0.0016 U	0.0013 U
Chloromethane	0.62 U	0.3 U	0.29 U	0.0039 U	0.3 U	0.0042 U	0.0046 U	0.0042 U	0.29 U	0.29 U	0.0039 U	0.0039 U	0.0038 U	0.0045 U	0.25 U	0.27 U	0.0043 U	0.0036 U
Dibromochloromethane	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Dibromomethane (Methylene Bromide)	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Dichlorodifluoromethane	1.5 U	0.76 U	0.72 U	0.0098 U	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
Ethylbenzene	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Hexachlorobutadiene	0.62 U	0.3 U	0.29 U	0.0039 U	0.3 U	0.0042 U	0.0046 U	0.0042 U	0.29 U	0.29 U	0.0039 U	0.0039 U	0.0038 U	0.0045 U	0.25 U	0.27 U	0.0043 U	0.0036 U
Isopropylbenzene (Cumene)	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Methyl Ethyl Ketone (2-Butanone)	1.5 U	0.76 U	0.72 U	0.0098 U	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1.5 U	0.76 U	0.72 U	0.0098 U	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
Methyl tert-butyl Ether (MTBE)	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Methylene Chloride	0.77 U	0.38 U	0.36 U	0.0049 U	0.37 U	0.0053 U	0.0057 U	0.0053 U	0.36 U	0.36 U	0.0049 U	0.0049 U	0.0047 U	0.0056 U	0.31 U	0.34 U	0.0053 U	0.0044 U
Naphthalene	0.62 U	0.3 U	0.29 U	0.0039 U	0.3 U	0.0042 U	0.0046 U	0.0042 U	0.29 U	0.29 U	0.0039 U	0.0039 U	0.0038 U	0.0045 U	0.25 U	0.27 U	0.0043 U	0.0036 U
n-Propylbenzene	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
p-Isopropyltoluene	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Styrene	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Tetrachloroethene	0.077 U	0.038 U	0.036 U	0.00049 U	0.037 U	0.00053 U	0.00057 U	0.00053 U	0.036 U	0.036 U	0.00049 U	0.00049 U	0.00047 U	0.00056 U	0.031 U	0.034 U	0.00053 U	0.00044 U
Toluene	0.15 U	0.058 J	0.052 J	0.0018	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.067 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.082 U	0.068 U	0.0011 U	0.00089 U
Trichloroethene	69	0.058 J	0.13 J	0.0052	0.032 J	0.00053 U	0.00052 U	0.00053 U	9.2	0.053	0.00049 U	0.00013 U	0.00032 U	0.0021 U	250	11	0.0020 U	0.0018 U
Trichlorofluoromethane	0.62 U	0.3 U	0.29 U	0.0039 U	0.3 U	0.0042 U	0.0046 U	0.0042 U	0.29 U	0.29 U	0.0039 U	0.0039 U	0.0038 U	0.0045 U	0.25 U	0.27 U	0.0043 U	0.0036 U
Vinyl Acetate	1.5 U	0.76 U	0.72 U	0.0098 U	0.74 U	0.011 U	0.011 U	0.01 U	0.72 U	0.72 U	0.0098 U	0.0097 U	0.0094 U	0.011 U	0.62 U	0.68 U	0.011 U	0.0089 U
Vinyl Chloride	0.15 U	0.36 J	4.3 J	0.019 J	3.4 J	4 J	0.0011 U	0.0010 U	0.072 U	0.072 U	0.011	0.00097 U	0.00094 U	0.0011 U	0.29	0.11 J	0.0011 U	0.00089 U
Xylene, m- & p-	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Xylene, o-	0.15 U	0.076 U	0.072 U	0.00098 U	0.074 U	0.0011 U	0.0011 U	0.0010 U	0.072 U	0.072 U	0.00098 U	0.00097 U	0.00094 U	0.0011 U	0.062 U	0.068 U	0.0011 U	0.00089 U
Xylenes, Total	0.31 U	0.15 U	0.14 U	0.0020 U	0.15 U	0.0021 U	0.0023 U	0.0021 U	0.14 U	0.14 U	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.12 U	0.14 U	0.0021 U	0.0018 U
Total CBTEX	0.12	0.058 J	0.052 J	0.0308	0.24	0.00039 J	0.0023 U	0.0021 U	0.14 U	0.107	0.0020 U	0.0019 U	0.0019 U	0.0022 U	0.095	0.14 U	0.0021 U	0.0018 U
Total CVOC	77.324	26.738	34.944	0.04656	12.822	4.00339	0.00096 U	0.0010 U	9.63	10.073	0.011	0.0136	0.00065 U	0.0011 U	273.491	18.127	0.0011 U	0.00089 U
Total VOC	77.444	26.796	34.996	0.09086	13.062	4.00918	0.00096	0.0042 U	9.63	10.18	0.0136	0.00065	0.00051	0.0058	273.586	18.127	0.00239	0.0018

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-070	DPT-070	DPT-070	DPT-070	DPT-070	DPT-070	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-072	DPT-072	DPT-072	DPT-072	DPT-072	DPT-073	DPT-073
Sample Depth (feet bgs)	4 - 5	24 - 25	29 - 30	36 - 37	36 - 37	44 - 45	4 - 5	21 - 22	21 - 22	29 - 30	30 - 31	39 - 40	43 - 44	4 - 5	24 - 45	32 - 33	38 - 39	39 - 40	4 - 5	14 - 15
Sample Date	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/7/2022	4/7/2022
Sample Type	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt
Analyte																				
1,1,1,2-Tetrachloroethane	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 U	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 U	0.037 U	0.32 U
1,1,1-Trichloroethane	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 U	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 U	0.037 U	0.32 U
1,1,2,2-Tetrachloroethane	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 U	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 U	0.037 U	0.32 U
1,1,2-Trichloroethane	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,1-Dichloroethane	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,1-Dichloroethene	0.00083 U	0.06 J	0.59 U	0.044 J	0.042 J	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.19	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,1-Dichloropropene	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 U	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 U	0.037 U	0.32 U
1,2,3-Trichlorobenzene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,2,3-Trichloropropane	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,2,4-Trichlorobenzene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,2,4-Trimethylbenzene	0.0017 U	0.13 U	0.64 J	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.18	7.1
1,2-Dibromo-3-Chloropropane	0.0025 U	0.19 U	1.8 U	0.21 U	0.2 U	0.0032 U	0.0030 U	0.0030 U	0.0033 U	0.26 U	0.23 U	0.0031 U	0.0029 U	0.0030 U	0.18 U	0.22 U	0.0033 U	0.0034 U	0.22 U	1.9 U
1,2-Dibromoethane (Ethylene Dibromide)	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,2-Dichlorobenzene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,2-Dichloroethane	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,2-Dichloroethene, cis-	0.00043 J	6.1	26	3.4	3.7	0.00022 J	0.0010 U	0.0010 U	0.0011 U	14	1.8	0.00023 J	0.00097 U	0.0010 U	3.4	0.4	0.00055 J	0.0011 U	0.55	31
1,2-Dichloroethene, Total	0.00043 J	6.1	26	3.4	3.7	0.00022 J	0.0015 U	0.0015 U	0.0016 U	14	1.8	0.00023 J	0.0015 U	0.0015 U	3.8	0.44	0.00055 J	0.0017 U	0.59	31.1
1,2-Dichloroethene, trans-	0.0012 U	0.019 J	0.89 U	0.022 J	0.025 J	0.0016 U	0.0015 U	0.0015 U	0.0016 U	0.08 J	0.12 U	0.0016 U	0.0015 U	0.0015 U	0.37	0.036 J	0.0016 U	0.0017 U	0.04 J	0.14 J
1,2-Dichloropropane	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0017 U	0.13 U	0.13 J	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.00020 J	0.12 U	0.14 U	0.0022 U	0.0023 U	0.052 J	1.5
1,3-Dichlorobenzene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,3-Dichloropropane	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,3-Dichloropropene, cis-	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 U	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 U	0.037 U	0.32 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U
1,4-Dichlorobenzene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
1,4-Dioxane (p-Dioxane)	0.067 U	5.1 U	47 U	5.7 U	5.3 U	0.085 U	0.081 U	0.081 U	0.087 U	7 U	6.2 U	0.083 U	0.078 U	0.08 U	4.8 U	5.8 U	0.087 U	0.091 U	6 U	52 U
2,2-Dichloropropane	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
2-Chlorotoluene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
2-Hexanone	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.01 U	0.011 U	0.87 U	0.78 U	0.01 U	0.0097 U	0.01 U	0.6 U	0.72 U	0.011 U	0.011 U	0.75 U	6.4 U
4-Chlorotoluene	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 U	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U
Acetone	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.0063 J	0.0067 J	0.87 U	0.78 U	0.01 U	0.0097 U	0.014	0.6 U	0.72 U	0.0064 J	0.01 J	0.75 U	6.4 U
Benzene	0.00042 U	0.032 U																		

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-070	DPT-070	DPT-070	DPT-070	DPT-070	DPT-070	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-071	DPT-072	DPT-072	DPT-072	DPT-072	DPT-072	DPT-073	DPT-073
Sample Depth (feet bgs)	4 - 5	24 - 25	29 - 30	36 - 37	36 - 37	44 - 45	4 - 5	21 - 22	21 - 22	29 - 30	30 - 31	39 - 40	43 - 44	4 - 5	24 - 45	32 - 33	38 - 39	39 - 40	4 - 5	14 - 15	
Sample Date	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/6/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/7/2022	4/7/2022
Sample Type	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt
Analyte																					
Carbon Tetrachloride	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 U	0.0011 UJ	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 U	0.0011 U	0.075 U	0.64 U	
Chlorobenzene	0.00042 U	0.032 U	0.3 U	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 UJ	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 UJ	0.037 U	0.32 U	
Chlorobromomethane	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U	
Chloroethane	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U	
Chloroform	0.0012 U	0.095 U	0.89 U	0.11 U	0.1 U	0.0016 U	0.0015 U	0.0015 U	0.0016 UJ	0.13 U	0.12 U	0.0016 U	0.0015 U	0.0015 U	0.09 U	0.11 U	0.0016 U	0.0017 U	0.018 U	0.97 U	
Chloromethane	0.0033 U	0.25 U	2.4 U	0.28 U	0.27 U	0.0043 U	0.0041 U	0.0041 U	0.0044 UJ	0.35 U	0.31 U	0.0041 U	0.0039 U	0.0040 U	0.24 U	0.29 U	0.0044 U	0.0045 U	0.3 U	2.6 U	
Dibromochloromethane	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.075 U	0.64 U	
Dibromomethane (Methylene Bromide)	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U	
Dichlorodifluoromethane	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.01 U	0.011 UJ	0.87 U	0.78 U	0.01 U	0.0097 U	0.01 U	0.6 U	0.72 U	0.011 U	0.011 U	0.75 U	6.4 U	
Ethylbenzene	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 UJ	0.0011 U	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.12	0.25 J	
Hexachlorobutadiene	0.0033 U	0.25 U	2.4 U	0.28 U	0.27 U	0.0043 UJ	0.0041 U	0.0041 UJ	0.0044 UJ	0.35 U	0.31 U	0.0041 UJ	0.0039 UJ	0.0040 U	0.24 U	0.29 U	0.0044 UJ	0.0045 UJ	0.3 U	2.6 U	
Isopropylbenzene (Cumene)	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 UJ	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 UJ	0.00097 UJ	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.032 J	0.12 J	
Methyl Ethyl Ketone (2-Butanone)	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.01 U	0.011 UJ	0.87 U	0.78 U	0.01 U	0.0097 U	0.01 U	0.6 U	0.72 U	0.011 U	0.011 U	0.75 U	6.4 U	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.01 UJ	0.011 UJ	0.87 U	0.78 U	0.01 U	0.0097 U	0.01 U	0.6 U	0.72 U	0.011 UJ	0.011 UJ	0.75 U	6.4 U	
Methyl tert-butyl Ether (MTBE)	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 U	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 U	0.0023 U	0.15 U	1.3 U	
Methylene Chloride	0.0042 U	0.32 U	3 U	0.36 U	0.33 U	0.0053 U	0.0051 U	0.0051 U	0.0054 UJ	0.44 U	0.39 U	0.0052 U	0.0049 U	0.0050 U	0.3 U	0.36 U	0.0054 U	0.0057 U	0.19 J	3.2 U	
Naphthalene	0.0033 U	0.25 U	2.4 U	0.28 U	0.27 U	0.0043 UJ	0.00095 J	0.0041 UJ	0.0044 UJ	0.35 U	0.31 U	0.0041 UJ	0.0039 UJ	0.0040 U	0.24 U	0.29 U	0.0044 UJ	0.0045 UJ	0.54	2.6 U	
n-Propylbenzene	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 UJ	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 UJ	0.00097 UJ	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.063 J	0.76 J	
p-Isopropyltoluene	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 UJ	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 UJ	0.00097 UJ	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.014 U	0.64 U	
Styrene	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.075 U	0.64 U	
Tetrachloroethene	0.00042 U	0.032 U	0.4	0.036 U	0.033 U	0.00053 U	0.00051 U	0.00051 U	0.00054 UJ	0.044 U	0.039 U	0.00052 U	0.00049 U	0.00050 U	0.03 U	0.036 U	0.00054 U	0.00057 UJ	0.023 J	1.4	
Toluene	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.6	0.64 U	
Trichloroethene	0.00035 J	2.1	320	3	2.4	0.00074	0.00051 U	0.00051 U	0.00054 UJ	0.044 U	0.039 U	0.00052 U	0.00049 U	0.0062	4.6	2	0.00038 J	0.00057 U	13	280	
Trichlorofluoromethane	0.0033 U	0.25 U	2.4 U	0.28 U	0.27 U	0.0043 U	0.0041 U	0.0041 U	0.0044 UJ	0.35 U	0.31 U	0.0041 U	0.0039 U	0.0040 U	0.24 U	0.29 U	0.0044 U	0.0045 U	0.3 U	2.6 U	
Vinyl Acetate	0.0083 U	0.63 U	5.9 U	0.71 U	0.67 U	0.011 U	0.01 U	0.01 U	0.011 UJ	0.87 U	0.78 U	0.01 U	0.0097 U	0.01 U	0.6 U	0.72 U	0.011 U	0.011 U	0.75 U	6.4 U	
Vinyl Chloride	0.00083 U	0.23 J	0.59 U	0.05 J	0.041 J	0.0011 U	0.0010 U	0.0010 U	0.0011 UJ	0.2 J	0.44	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.011 J	0.0040 J	0.075 U	0.64 U	
Xylene, m- & p-	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 UJ	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 UJ	0.0023 UJ	0.6	1 J	
Xylene, o-	0.00083 U	0.063 U	0.59 U	0.071 U	0.067 U	0.0011 U	0.0010 U	0.0010 UJ	0.0011 UJ	0.087 U	0.078 U	0.0010 U	0.00097 U	0.0010 U	0.06 U	0.072 U	0.0011 UJ	0.0011 UJ	0.28	0.55 J	
Xylenes, Total	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 UJ	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.12 U	0.14 U	0.0022 UJ	0.0023 UJ	0.88	1.55 J	
Total CBTEX	0.0017 U	0.13 U	1.2 U	0.14 U	0.13 U	0.0021 U	0.0020 U	0.0020 UJ	0.0022 UJ	0.17 U	0.16 U	0.0021 U	0.0019 U	0.0020 U	0.018 J	0.14 U	0.0022 UJ	0.0023 UJ	1.812	1.92	
Total CVOC	0.00078 J	8.509	346.4	6.516	6.208	0.00096	0.0010 U	0.0010 U	0.0011 UJ	14.47	2.24	0.00023 J	0.00097 U	0.0062	8.37	2.436	0.01193 J	0.004 J	13.613	312.54	
Total VOC	0.00078	8.509	347.17	6.516	6.208	0.00096	0.00095	0.0063	0.0067	14.47	2.24	0.00683	0.0097 U	0.0204	8.388	2.436	0.01833	0.014	16.518	323.82	

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-073	DPT-073	DPT-073	DPT-073	DPT-074	DPT-074	DPT-074	DPT-074	DPT-074	DPT-075	DPT-075	DPT-075	DPT-075	DPT-075	DPT-076	DPT-076	DPT-076	DPT-076	DPT-076
Sample Depth (feet bgs)	20 - 21	29 - 30	37 - 38	49 - 50	4 - 5	26 - 27	26 - 27	31 - 32	37 - 38	9 - 10	25 - 26	25 - 26	33 - 34	38 - 39	5 - 6	18 - 19	24 - 25	34 - 34.5	36 - 37
Sample Date	4/7/2022	4/11/2022	4/11/2022	4/11/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022
Sample Type	N	N	N	N	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																			
1,1,1,2-Tetrachloroethane	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
1,1,1-Trichloroethane	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
1,1,2,2-Tetrachloroethane	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
1,1,2-Trichloroethane	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,1-Dichloroethane	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,1-Dichloroethene	0.18 J	0.012	0.11	0.00091 U	0.00079 U	0.18 U	0.16 U	0.084 J	0.00091 J	0.0010 U	0.29 U	0.012 J	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,1-Dichloropropene	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
1,2,3-Trichlorobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,2,3-Trichloropropane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,2,4-Trichlorobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,2,4-Trimethylbenzene	6.8	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.12 J	0.1 J	0.57 U	0.0020 U	0.0020 U	0.27 J	0.048 J	0.14 U	0.0019 U	0.0020	0.28 U	0.025 J	0.0024 U	0.0021 U
1,2-Dibromo-3-Chloropropane	1.1 U	0.0033 U	0.2 U	0.0027 U	0.0024 U	0.54 U	0.48 U	0.86 U	0.0030 U	0.0030 U	0.86 U	0.1 U	0.22 U	0.0029 U	0.0030 U	0.42 U	0.11 U	0.0036 U	0.0032 U
1,2-Dibromoethane (Ethylene Dibromide)	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,2-Dichlorobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,2-Dichloroethane	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.066 J	0.036 U	0.0013	0.0011 U
1,2-Dichloroethene, cis-	63 J	1.8	6.6	0.0033 U	0.00079 U	6.7	6.5	24	0.18 J	0.0010 U	14	2	1.3	0.00088 J	0.0010 U	5.1	0.59	0.0012 U	0.0011 U
1,2-Dichloroethene, Total	63.1 J	1.8	6.8	0.0033 U	0.0012 U	6.7	6.5	24	0.18 J	0.0015 U	14	2	1.3	0.00088 J	0.0015 U	5.1	0.59	0.0018 U	0.0016 U
1,2-Dichloroethene, trans-	0.13 J	0.047	0.18	0.0014 U	0.0012 U	0.27 U	0.24 U	0.19 J	0.0011 J	0.0015 U	0.039 J	0.0082 J	0.021 J	0.0014 U	0.0015 U	0.028 J	0.055 U	0.0018 U	0.0016 U
1,2-Dichloropropane	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	1.4	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.0096 J	0.14 U	0.0019 U	0.00093 J	0.28 U	0.073 U	0.0024 U	0.0021 U
1,3-Dichlorobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,3-Dichloropropane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,3-Dichloropropene, cis-	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
1,4-Dichlorobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
1,4-Dioxane (p-Dioxane)	29 U	0.089 U	5.2 U	0.073 U	0.063 U	14 U	13 U	23 U	0.079 U	0.08 U	23 U	2.7 U	5.8 U	0.077 U	0.081 U	11 U	2.9 U	0.095 U	0.085 U
2,2-Dichloropropane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
2-Chlorotoluene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
2-Hexanone	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.01 U	1.4 U	0.36 U	0.012 U	0.011 U
4-Chlorotoluene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Acetone	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.033	1.4 U	0.36 U	0.012 U	0.011 U
Benzene	0.18 U	0.00055 J	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00031 J	0.00050 U	0.6	0.083	0.061	0.00048 U	0.00032 J	2.2	0.47	0.046	0.00053 U
Bromobenzene	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Bromodichloromethane	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
Bromoform	1.4 U	0.0044 U	0.26 U	0.0036 U	0.0032 U	0.72 U	0.64 U	1.1 U	0.0039 U	0.0040 U	1.2 U	0.13 U	0.29 U	0.0038 U	0.0040 U	0.57 U	0.15 U	0.0047 U	0.0042 U
Bromomethane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Butylbenzene, n-	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.00017 J	0.14 U	0.036 U	0.0012 U	0.0011 U
Butylbenzene, sec-	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.00057 J	0.14 U	0.036 U	0.0012 U	0.0011 U
Butylbenzene, t-	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Carbon Disulfide	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.01 U	1.4 U	0.36 U	0.012 U	0.011 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-073	DPT-073	DPT-073	DPT-073	DPT-074	DPT-074	DPT-074	DPT-074	DPT-074	DPT-075	DPT-075	DPT-075	DPT-075	DPT-075	DPT-076	DPT-076	DPT-076	DPT-076	DPT-076
Sample Depth (feet bgs)	20 - 21	29 - 30	37 - 38	49 - 50	4 - 5	26 - 27	26 - 27	31 - 32	37 - 38	9 - 10	25 - 26	25 - 26	33 - 34	38 - 39	5 - 6	18 - 19	24 - 25	34 - 34.5	36 - 37
Sample Date	4/7/2022	4/11/2022	4/11/2022	4/11/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/7/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/12/2022
Sample Type	N	N	N	N	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																			
Carbon Tetrachloride	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
Chlorobenzene	0.18 U	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.09 U	0.081 U	0.14 U	0.00049 U	0.00050 U	0.14 U	0.017 U	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
Chlorobromomethane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Chloroethane	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Chloroform	0.54 U	0.0017 U	0.0097 U	0.0014 U	0.0012 U	0.27 U	0.24 U	0.43 U	0.0015 U	0.0015 U	0.43 U	0.05 U	0.11 U	0.0014 U	0.0015 U	0.21 U	0.0051 J	0.0018 U	0.0016 U
Chloromethane	1.4 U	0.0044 U	0.26 U	0.0036 U	0.0032 U	0.72 U	0.64 U	1.1 U	0.0039 U	0.0040 U	1.2 U	0.13 U	0.29 U	0.0038 U	0.0040 U	0.57 U	0.15 U	0.0047 U	0.0042 U
Dibromochloromethane	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
Dibromomethane (Methylene Bromide)	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Dichlorodifluoromethane	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.01 U	1.4 U	0.36 U	0.012 U	0.011 U
Ethylbenzene	0.13 J	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.00063 J	0.14 U	0.04	0.0012 U	0.0011 U
Hexachlorobutadiene	1.4 U	0.0044 U	0.26 U	0.0036 U	0.0032 U	0.72 U	0.64 U	1.1 U	0.0039 U	0.0040 U	1.2 U	0.13 U	0.29 U	0.0038 U	0.0040 U	0.57 U	0.15 U	0.0047 U	0.0042 U
Isopropylbenzene (Cumene)	0.092 J	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.00093	0.14 U	0.044	0.0012 U	0.0011 U
Methyl Ethyl Ketone (2-Butanone)	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.031 J	1.4 U	0.36 U	0.012 U	0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.01 U	1.4 U	0.36 U	0.012 U	0.011 U
Methyl tert-butyl Ether (MTBE)	0.73 U	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0020 U	0.28 U	0.073 U	0.0024 U	0.0021 U
Methylene Chloride	1.8 U	0.0056 U	0.33 U	0.0046 U	0.0040 U	0.9 U	0.81 U	1.4 U	0.0049 U	0.0050 U	1.4 U	0.17 U	0.36 U	0.0048 U	0.0051 U	0.71 U	0.18 U	0.0059 U	0.0053 U
Naphthalene	0.3 J	0.0044 U	0.26 U	0.0036 U	0.0032 U	0.72 U	0.64 U	1.1 U	0.0039 U	0.0040 U	1.2 U	0.13 U	0.29 U	0.0038 U	0.0040 U	0.12 J	0.15 U	0.0047 U	0.0042 U
n-Propylbenzene	0.53	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.0064 J	0.072 U	0.00096 U	0.0026 J	0.14 U	0.031 J	0.0012 U	0.0011 U
p-Isopropyltoluene	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.00029 J	0.14 U	0.036 U	0.0012 U	0.0011 U
Styrene	0.36 U	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.033 U	0.072 U	0.00096 U	0.0010 U	0.14 U	0.036 U	0.0012 U	0.0011 U
Tetrachloroethene	0.47	0.00056 U	0.033 U	0.00046 U	0.00040 U	0.035 J	0.037 J	0.14 U	0.00049 U	0.00050 U	0.21	0.03	0.036 U	0.00048 U	0.00051 U	0.071 U	0.018 U	0.00059 U	0.00053 U
Toluene	0.56	0.0011 U	0.044 J	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.7	0.09 U	0.072 U	0.00096 U	0.0010	0.55	0.14 U	0.0012 U	0.0011 U
Trichloroethene	150	0.053	32	0.00046 U	0.00028 J	740	670	120	0.078	0.00050 U	110	150	0.024 J	0.00057 J	0.00044 U	64	9	0.00059 U	0.00015 J
Trichlorofluoromethane	1.4 U	0.0044 U	0.26 U	0.0036 U	0.0032 U	0.72 U	0.64 U	1.1 U	0.0039 U	0.0040 U	1.2 U	0.13 U	0.29 U	0.0038 U	0.0040 U	0.57 U	0.15 U	0.0047 U	0.0042 U
Vinyl Acetate	3.6 U	0.011 U	0.66 U	0.0091 U	0.0079 U	1.8 U	1.6 U	2.9 U	0.0098 U	0.01 U	2.9 U	0.33 U	0.72 U	0.0096 U	0.01 U	1.4 U	0.36 U	0.012 U	0.011 U
Vinyl Chloride	0.31 J	0.16	0.06 J	0.0040 U	0.00079 U	0.15 J	0.15 J	1.3	0.19 J	0.0010 U	0.58	0.2	0.19	0.091 J	0.0010 U	0.13 J	0.022 J	0.0012 U	0.0011 U
Xylene, m- & p-	0.33 J	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.067 U	0.14 U	0.0019 U	0.0048	0.28 U	0.21	0.0024 U	0.0021 U
Xylene, o-	0.42	0.0011 U	0.066 U	0.00091 U	0.00079 U	0.18 U	0.16 U	0.29 U	0.00098 U	0.0010 U	0.29 U	0.013 J	0.072 U	0.00096 U	0.0011	0.14 U	0.018 J	0.0012 U	0.0011 U
Xylenes, Total	0.75 J	0.0022 U	0.13 U	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.0020 U	0.0020 U	0.58 U	0.013 J	0.14 U	0.0019 U	0.0059	0.28 U	0.228 J	0.0024 U	0.0021 U
Total CBTEX	1.532	0.00055 J	0.044 J	0.0018 U	0.0016 U	0.36 U	0.32 U	0.57 U	0.00031 J	0.0020 U	1.3	0.096	0.061	0.0019 U	0.01715	2.75	0.782	0.046	0.0021 U
Total CVOC	214.09	2.072	38.95	0.0073	0.00028 J	746.885	676.687	145.574	0.45001	0.0010 U	124.829	152.25	1.535	0.09245 J	0.00044	69.258	9.612	0.0027	0.00015
Total VOC	224.652	2.07255	39.0037	0.0073	0.00028	747.005	676.787	145.574	0.45032	0.01 U	126.399	152.5	1.596	0.09245	0.08815	72.194	10.5951	0.0487	0.00015

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-076	DPT-076	DPT-077	DPT-077	DPT-077	DPT-077	DPT-077	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-079	DPT-079	DPT-079	DPT-079
Sample Depth (feet bgs)	42 - 43	42 - 43	4 - 5	13.5 - 15	20 - 25	29 - 30	34 - 35	6 - 7	15 - 16	17 - 18	26 - 27	30 - 31	30 - 31	35 - 36	7 - 8	11 - 12	16 - 17	23 - 24
Sample Date	4/12/2022	4/12/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022
Sample Type	N	FD	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
1,1,1-Trichloroethane	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
1,1,2,2-Tetrachloroethane	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 UJ	0.00041 U	0.00046 U
1,1,2-Trichloroethane	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 UJ	0.00083 U	0.00093 U
1,1-Dichloroethane	0.00063 J	0.00068 J	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.0013
1,1-Dichloroethene	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.059 J	0.035 J	0.0010 U	0.015 J	0.016 J	0.063 U	0.00098 J	0.0016	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00028 J
1,1-Dichloropropene	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
1,2,3-Trichlorobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,2,3-Trichloropropane	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,2,4-Trichlorobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,2,4-Trimethylbenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,2-Dibromo-3-Chloropropane	0.0034 U	0.0025 U	0.0046 UJ	0.0027 U	0.0029 U	0.2 U	0.2 U	0.0031 U	0.19 U	0.18 U	0.19 U	0.0032 UJ	0.0032 UJ	0.0029 U	0.0024 U	0.0024 UJ	0.0025 U	0.0028 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 UJ	0.00083 U	0.00093 U
1,2-Dichlorobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,2-Dichloroethane	0.0012	0.0014	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.0012
1,2-Dichloroethene, cis-	0.0015	0.0016	0.0015 UJ	0.0017	0.00098 U	8.3	4.8	0.0010 U	0.6	0.46	0.29	0.037	0.044	0.00098 U	0.00019 J	0.0024	0.0074	0.0024
1,2-Dichloroethene, Total	0.0015	0.0016	0.0023 UJ	0.0017	0.0015 U	8.3	4.8	0.0015 U	0.6	0.56	0.40	0.046	0.055	0.0015 U	0.00019 J	0.0024	0.0074	0.0029
1,2-Dichloroethene, trans-	0.0017 U	0.0012 U	0.0023 UJ	0.0013 U	0.0015 U	0.036 J	0.016 J	0.0015 U	0.075 J	0.1	0.11	0.0086	0.011	0.0015 U	0.0012 U	0.0012 U	0.00011 J	0.00049 J
1,2-Dichloropropane	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
1,3-Dichlorobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,3-Dichloropropane	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,3-Dichloropropene, cis-	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 UJ	0.00083 U	0.00093 U
1,4-Dichlorobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 UJ	0.0022 UJ	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
1,4-Dioxane (p-Dioxane)	0.092 U	0.067 U	0.12 UJ	0.071 U	0.078 U	5.4 U	5.4 U	0.082 U	5.1 U	4.8 U	5 U	0.084 UJ	0.087 UJ	0.078 U	0.065 UJ	0.063 UJ	0.066 U	0.074 UJ
2,2-Dichloropropane	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
2-Chlorotoluene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
2-Hexanone	0.011 U	0.0084 U	0.015 UJ	0.0089 U	0.0098 U	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.01 U	0.011 U	0.0098 U	0.0081 U	0.0078 UJ	0.0083 U	0.0093 U
4-Chlorotoluene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
Acetone	0.011 U	0.0084 U	0.15 J	0.0089 U	0.0068 J	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.0060 J	0.011 U	0.0054 J	0.0081 U	0.0068 J	0.0083 U	0.0063 J
Benzene	0.044	0.048	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.031 J	0.016 J	0.031 U	0.0026	0.0033	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00039 J
Bromobenzene	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
Bromodichloromethane	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
Bromoform	0.0046 U	0.0033 U	0.0061 UJ	0.0036 U	0.0039 U	0.27 U	0.27 U	0.0041 U	0.25 U	0.24 U	0.25 U	0.0042 U	0.0043 U	0.0039 U	0.0032 U	0.0031 UJ	0.0033 U	0.0037 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-076	DPT-076	DPT-077	DPT-077	DPT-077	DPT-077	DPT-077	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-078	DPT-079	DPT-079	DPT-079	DPT-079
Sample Depth (feet bgs)	42 - 43	42 - 43	4 - 5	13.5 - 15	20 - 25	29 - 30	34 - 35	6 - 7	15 - 16	17 - 18	26 - 27	30 - 31	30 - 31	35 - 36	7 - 8	11 - 12	16 - 17	23 - 24
Sample Date	4/12/2022	4/12/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	4/5/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022	8/23/2022
Sample Type	N	FD	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 UJ	0.0011 UJ	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Chlorobenzene	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00041 U	0.00046 U
Chlorobromomethane	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
Chloroethane	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.00045 J	0.0016 U	0.0016 U	0.0016 U	0.0019 U
Chloroform	0.0017 U	0.0012 U	0.0023 UJ	0.0013 U	0.0015 U	0.1 U	0.1 U	0.0015 U	0.095 U	0.091 U	0.094 U	0.0016 U	0.0016 U	0.0015 U	0.0012 U	0.0012 U	0.0012 U	0.0014 U
Chloromethane	0.0046 U	0.0033 U	0.0061 UJ	0.0036 U	0.0039 U	0.27 U	0.27 U	0.0041 U	0.25 U	0.24 U	0.25 U	0.0042 U	0.0043 U	0.0039 U	0.0032 U	0.0031 U	0.0033 U	0.0037 U
Dibromochloromethane	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Dibromomethane (Methylene Bromide)	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 UJ	0.0016 U	0.0019 U
Dichlorodifluoromethane	0.011 U	0.0084 U	0.015 UJ	0.0089 U	0.0098 U	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.01 U	0.011 U	0.0098 U	0.0081 UJ	0.0078 UJ	0.0083 U	0.0093 UJ
Ethylbenzene	0.00031 J	0.00029 J	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Hexachlorobutadiene	0.0046 U	0.0033 U	0.0061 UJ	0.0036 U	0.0039 U	0.27 U	0.27 U	0.0041 U	0.25 U	0.24 U	0.25 U	0.0042 U	0.0043 U	0.0039 U	0.0032 U	0.0031 UJ	0.0033 U	0.0037 U
Isopropylbenzene (Cumene)	0.00017 J	0.00014 J	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Methyl Ethyl Ketone (2-Butanone)	0.011 U	0.0084 U	0.0043 J	0.0089 U	0.0098 U	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.01 U	0.011 U	0.0098 U	0.0081 U	0.0078 UJ	0.0083 U	0.0093 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.011 U	0.0084 U	0.015 UJ	0.0089 U	0.0098 U	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.01 U	0.011 U	0.0098 U	0.0081 U	0.0078 UJ	0.0083 U	0.0093 U
Methyl tert-butyl Ether (MTBE)	0.0023 U	0.0017 U	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 UJ	0.0022 UJ	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
Methylene Chloride	0.0057 U	0.0042 U	0.0077 UJ	0.0045 U	0.0049 U	0.33 U	0.34 U	0.0051 U	0.32 U	0.3 U	0.31 U	0.0053 U	0.0054 U	0.0049 U	0.0040 U	0.0039 U	0.0041 U	0.0046 U
Naphthalene	0.0046 U	0.0033 U	0.015 J	0.0036 U	0.0039 U	0.27 U	0.27 U	0.0041 U	0.25 U	0.24 U	0.25 U	0.0042 U	0.0043 U	0.0039 U	0.0032 U	0.0031 UJ	0.0033 U	0.0037 U
n-Propylbenzene	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
p-Isopropyltoluene	0.0011 U	0.00084 U	0.0029 J	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 UJ	0.00083 U	0.00093 U
Styrene	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00050 U	0.00048 U	0.00083 U	0.00093 U
Tetrachloroethene	0.00057 U	0.00042 U	0.00077 UJ	0.00045 U	0.00049 U	0.033 U	0.034 U	0.00051 U	0.032 U	0.03 U	0.031 U	0.00053 U	0.00054 U	0.00049 U	0.00040 U	0.00039 U	0.00033 J	0.00046 U
Toluene	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Trichloroethene	0.0041	0.0049	0.0017 J	0.024	0.00049 U	10	0.78	0.00049 J	3.8	2.8	3.7	1.9	1.8	0.00049 U	0.0021	0.012 J	0.05	0.0014
Trichlorofluoromethane	0.0046 U	0.0033 U	0.0061 UJ	0.0036 U	0.0039 U	0.27 U	0.27 U	0.0041 U	0.25 U	0.24 U	0.25 U	0.0042 U	0.0043 U	0.0039 U	0.0032 U	0.0031 U	0.0033 U	0.0037 U
Vinyl Acetate	0.011 U	0.0084 U	0.015 UJ	0.0089 U	0.0098 U	0.67 U	0.67 U	0.01 U	0.64 U	0.61 U	0.63 U	0.01 UJ	0.011 UJ	0.0098 U	0.0081 U	0.0078 UJ	0.0083 U	0.0093 U
Vinyl Chloride	0.0011 U	0.00034 J	0.0015 UJ	0.00089 U	0.00098 U	0.033 J	0.27	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.00069 J	0.00043 J	0.00081 U	0.00078 U	0.00083 U	0.0073
Xylene, m- & p-	0.0012 J	0.0011 J	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
Xylene, o-	0.0011 U	0.00084 U	0.0015 UJ	0.00089 U	0.00098 U	0.067 U	0.067 U	0.0010 U	0.064 U	0.061 U	0.063 U	0.0010 U	0.0011 U	0.00098 U	0.00081 U	0.00078 U	0.00083 U	0.00093 U
Xylenes, Total	0.0012 J	0.0011 J	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.13 U	0.12 U	0.12 U	0.0021 U	0.0022 U	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.0019 U
Total CBTEX	0.04568	0.04953	0.0031 UJ	0.0018 U	0.0020 U	0.13 U	0.13 U	0.0020 U	0.031	0.016	0.12 U	0.0026	0.0033	0.0020 U	0.0016 U	0.0016 U	0.0016 U	0.00039 J
Total CVOC	0.0056	0.00684	0.0017	0.0257	0.00098 U	18.428	5.901	0.00049	4.49	3.376	4.1	1.94658	1.85729	0.00043	0.00229	0.0144	0.05784	0.01187
Total VOC	0.05311	0.05845	0.1739	0.0257	0.0068	18.428	5.901	0.00049	4.521	3.392	4.1	1.95518	1.86059	0.00628	0.00279	0.02168	0.05784	0.02106

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-079	DPT-079	DPT-079	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082
Sample Depth (feet bgs)	28 - 29	36 - 37	42 - 43	6 - 7	13 - 14	20 - 21	23 - 24	25 - 26	35 - 36	42 - 43	8 - 9	8 - 9	15 - 16	23 - 24	31 - 32	35 - 37	47 - 48	47 - 48
Sample Date	8/23/2022	8/23/2022	8/23/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	FD
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Silty Sand	Deep Silty Sand	Deep Silty Sand	Deep Silty Sand	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
1,1,1,2-Tetrachloroethane	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 UJ	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
1,1,1-Trichloroethane	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 U	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
1,1,2,2-Tetrachloroethane	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 U	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
1,1,2-Trichloroethane	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 U	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,1-Dichloroethane	0.00016 J	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.00023 J	0.0011 U	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,1-Dichloroethene	0.00098 U	0.0021	0.0010 U	0.00081 U	0.011 J	0.21 J	1.3	0.0068	0.0011 U	0.0011 U	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,1-Dichloropropene	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 U	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
1,2,3-Trichlorobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
1,2,3-Trichloropropane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
1,2,4-Trichlorobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
1,2,4-Trimethylbenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.27	8.6	120	0.0085	0.0079	0.00062 J	3.9	2.9	0.00037 J	0.13 U	0.0016 J	0.00060 J	0.0021 U	0.0022 U
1,2-Dibromo-3-Chloropropane	0.0029 U	0.0032 U	0.0031 U	0.0024 U	0.14 U	1.7 U	1.7 U	0.0034 UJ	0.0034 U	0.0034 UJ	0.15 UJ	0.16 UJ	0.0030 U	0.2 UJ	0.0033 U	0.0030 UJ	0.0032 UJ	0.0033 UJ
1,2-Dibromoethane (Ethylene Dibromide)	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 UJ	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,2-Dichlorobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
1,2-Dichloroethane	0.0010	0.00058 J	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 U	0.05 U	0.052 U	0.0074	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,2-Dichloroethene, cis-	0.0020	0.09	0.017	0.00015 J	1.9	15	38	1.9	0.0014	0.00029 J	0.05 U	0.052 U	0.0021	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,2-Dichloroethene, Total	0.0030 J	0.098	0.018	0.00015 J	1.9	15	38.2	1.9	0.0014	0.00029 J	0.074 U	0.078 U	0.0021	0.099 U	0.0016 U	0.0015 U	0.0016 U	0.0016 U
1,2-Dichloroethene, trans-	0.0010 J	0.0079	0.00054 J	0.0012 U	0.0075 J	0.86 U	0.24 J	0.013	0.0017 U	0.0017 U	0.074 U	0.078 U	0.0015 U	0.099 U	0.0016 U	0.0015 U	0.0016 U	0.0016 U
1,2-Dichloropropane	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 U	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.019 J	2.2	37	0.0029	0.0025	0.00022 J	1.1	0.88	0.0020 U	0.13 U	0.00051 J	0.00020 J	0.0021 U	0.0022 U
1,3-Dichlorobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
1,3-Dichloropropane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
1,3-Dichloropropene, cis-	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 U	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene, trans-	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 UJ	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
1,4-Dichlorobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 UJ	0.0023 U	0.0023 UJ	0.099 UJ	0.1 UJ	0.0020 U	0.13 UJ	0.0022 U	0.0020 UJ	0.0021 UJ	0.0022 UJ
1,4-Dioxane (p-Dioxane)	0.078 UJ	0.085 UJ	0.083 UJ	0.065 U	3.8 U	46 U	45 U	0.09 UJ	0.091 U	0.091 U	4 UJ	4.1 UJ	0.081 U	5.3 UJ	0.088 U	0.08 UJ	0.085 UJ	0.087 UJ
2,2-Dichloropropane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
2-Chlorotoluene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
2-Hexanone	0.0098 U	0.011 U	0.01 U	0.0081 U	0.47 U	5.8 U	5.6 U	0.011 U	0.011 U	0.011 U	0.5 U	0.52 U	0.01 U	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U
4-Chlorotoluene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
Acetone	0.0070 J	0.011 U	0.01 U	0.0052 J	0.47 U	5.8 U	5.6 U	0.0083 J	0.011 U	0.011 U	0.5 U	0.52 U	0.0064 J	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U
Benzene	0.0027	0.0019	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00032 J	0.0048	0.00057 U	0.025 U	0.026 U	0.014	0.033 U	0.0085	0.014	0.00053 U	0.00054 U
Bromobenzene	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 UJ	0.0021 U	0.0022 U
Bromodichloromethane	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 UJ	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
Bromoform	0.0039 U	0.0042 U	0.0042 U	0.0032 U	0.19 U	2.3 U	2.3 U	0.0045 U	0.0045 U	0.0045 UJ	0.2 U	0.21 U	0.0040 U	0.26 U	0.0044 U	0.0040 UJ	0.0042 U	0.0044 U
Bromomethane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
Butylbenzene, n-	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.026 J	0.58 U	2.1	0.0011 U	0.0011 U	0.0011 UJ	0.8	0.48	0.0010 U	0.066 U	0.0011 U	0.0010 UJ	0.0011 U	0.0011 U
Butylbenzene, sec-	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.043 J	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 UJ	0.13	0.14	0.0010 U	0.066 U	0.0011 U	0.0010 UJ	0.0011 U	0.0011 U
Butylbenzene, t-	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 UJ	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
Carbon Disulfide	0.0098 U	0.011 U	0.01 U	0.0081 U	0.47 U	5.8 U	5.6 U	0.0061 J	0.011 U	0.011 U	0.5 U	0.52 U	0.01 U	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-079	DPT-079	DPT-079	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-080	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082	DPT-082
Sample Depth (feet bgs)	28 - 29	36 - 37	42 - 43	6 - 7	13 - 14	20 - 21	23 - 24	25 - 26	35 - 36	42 - 43	8 - 9	8 - 9	15 - 16	23 - 24	31 - 32	35 - 37	47 - 48	47 - 48
Sample Date	8/23/2022	8/23/2022	8/23/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/24/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022
Sample Type	N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	FD
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Silty Sand	Deep Silty Sand	Deep Silty Sand	Deep Silty Sand	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt
Analyte																		
Carbon Tetrachloride	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 UJ	0.0011 U	0.0011 U	0.05 UJ	0.052 UJ	0.0010 U	0.066 UJ	0.0011 U	0.0010 UJ	0.0011 UJ	0.0011 UJ
Chlorobenzene	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.023 U	0.29 U	0.28 U	0.00056 U	0.00057 U	0.00057 UJ	0.025 U	0.026 U	0.00050 U	0.033 U	0.0020	0.00050 U	0.00053 U	0.00054 U
Chlorobromomethane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
Chloroethane	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
Chloroform	0.0015 U	0.0016 U	0.0016 U	0.0012 U	0.07 U	0.86 U	0.85 U	0.0017 U	0.0017 U	0.0017 U	0.074 U	0.078 U	0.0015 U	0.099 U	0.0016 U	0.0015 U	0.0016 U	0.0016 U
Chloromethane	0.0039 U	0.0042 U	0.0042 U	0.0032 U	0.19 U	2.3 U	2.3 U	0.0045 U	0.0045 U	0.0045 U	0.2 U	0.21 U	0.0040 U	0.26 U	0.0044 U	0.0040 U	0.0042 U	0.0044 U
Dibromochloromethane	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 UJ	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Dibromomethane (Methylene Bromide)	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 U	0.0023 U	0.0023 U	0.099 U	0.1 U	0.0020 U	0.13 U	0.0022 U	0.0020 U	0.0021 U	0.0022 U
Dichlorodifluoromethane	0.0098 UJ	0.011 UJ	0.01 UJ	0.0081 U	0.47 U	5.8 U	5.6 U	0.011 U	0.011 U	0.011 U	0.5 U	0.52 U	0.01 U	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U
Ethylbenzene	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.015 J	0.16 J	0.42 J	0.00066 J	0.0011 U	0.0011 UJ	16 J	8.4 J	0.0023	4.2	0.0082	0.0026	0.0011 U	0.0011 U
Hexachlorobutadiene	0.0039 U	0.0042 U	0.0042 U	0.0032 U	0.19 U	2.3 U	2.3 U	0.0045 U	0.0045 U	0.0045 UJ	0.2 U	0.21 U	0.0040 U	0.26 U	0.0044 U	0.0040 UJ	0.0042 U	0.0044 U
Isopropylbenzene (Cumene)	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.081	0.14 J	1.3	0.00036 J	0.00019 J	0.0011 UJ	1.5	1.1	0.00026 J	0.0072 J	0.00077 J	0.00030 J	0.0011 U	0.0011 U
Methyl Ethyl Ketone (2-Butanone)	0.0098 U	0.011 U	0.01 U	0.0081 U	0.47 U	5.8 U	5.6 U	0.011 U	0.011 U	0.011 U	0.5 U	0.52 U	0.01 U	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0098 U	0.011 U	0.01 U	0.0081 U	0.47 U	5.8 U	5.6 U	0.011 U	0.011 U	0.011 U	0.5 U	0.52 U	0.01 U	0.66 U	0.011 U	0.01 U	0.011 U	0.011 U
Methyl tert-butyl Ether (MTBE)	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	1.2 U	1.1 U	0.0022 UJ	0.0023 U	0.0023 U	0.099 UJ	0.1 UJ	0.0020 U	0.13 UJ	0.0022 U	0.0020 UJ	0.0021 UJ	0.0022 UJ
Methylene Chloride	0.0049 U	0.0053 U	0.0052 U	0.0040 U	0.23 U	2.9 U	2.8 U	0.0056 U	0.0057 U	0.0057 U	0.25 U	0.26 U	0.0050 U	0.33 U	0.0055 U	0.0050 U	0.0053 U	0.0054 U
Naphthalene	0.0039 U	0.0042 U	0.0042 U	0.0032 U	0.19 U	2.3 U	0.67 J	0.0045 U	0.0045 U	0.0045 UJ	2.4	1.7	0.0040 U	0.26 U	0.00072 J	0.0040 UJ	0.0042 U	0.0044 U
n-Propylbenzene	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.18	1.4	19	0.0017	0.0013	0.0011 UJ	1.4	1.2	0.0010 U	0.066 U	0.00053 J	0.00024 J	0.0011 U	0.0011 U
p-Isopropyltoluene	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.0053 J	0.58 U	2.2	0.0011 U	0.0011 U	0.0011 UJ	0.12	0.12	0.0010 U	0.066 U	0.0011 U	0.0010 UJ	0.0011 U	0.0011 U
Styrene	0.00098 U	0.00063 U	0.0010 U	0.00081 U	0.047 U	0.58 U	0.56 U	0.0011 U	0.0011 U	0.0011 UJ	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Tetrachloroethene	0.00049 U	0.00053 U	0.00052 U	0.00040 U	0.01 J	1	1.8	0.00056 U	0.00057 U	0.00057 UJ	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 UJ	0.00053 U	0.00054 U
Toluene	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.34 J	0.46 J	0.0011 U	0.0011 U	0.0011 UJ	0.05 U	0.052 U	0.0010 U	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Trichloroethene	0.00049 U	0.00053 U	0.00052 U	0.0036	4.5	1200	290	0.085	0.032	0.0063	0.025 U	0.026 U	0.00050 U	0.033 U	0.00055 U	0.00050 U	0.00053 U	0.00054 U
Trichlorofluoromethane	0.0039 U	0.0042 U	0.0042 U	0.0032 U	0.19 U	2.3 U	2.3 U	0.0045 U	0.0045 U	0.0045 U	0.2 U	0.21 U	0.0040 U	0.26 U	0.0044 U	0.0040 U	0.0042 U	0.0044 U
Vinyl Acetate	0.0098 U	0.011 U	0.01 U	0.0081 U	0.47 U	5.8 U	5.6 U	0.011 UJ	0.011 U	0.011 UJ	0.5 UJ	0.52 UJ	0.01 U	0.66 UJ	0.011 U	0.01 UJ	0.011 UJ	0.011 UJ
Vinyl Chloride	0.0015	0.00082 J	0.00066 J	0.00081 U	0.1	1.3	1.9	0.09	0.0011 U	0.0011 U	0.05 U	0.052 U	0.0027	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Xylene, m- & p-	0.0020 U	0.0021 U	0.0021 U	0.0016 U	0.094 U	0.57 J	0.59 J	0.00075 J	0.0023 U	0.0023 UJ	33 J	11 J	0.0044	0.09 J	0.016	0.0038	0.0021 U	0.0022 U
Xylene, o-	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.28 J	0.43 J	0.0011 U	0.0011 U	0.0011 UJ	0.023 J	0.052 U	0.0010 U	0.066 U	0.00063 J	0.0010 U	0.0011 U	0.0011 U
Xylenes, Total	0.00098 U	0.0011 U	0.0010 U	0.00081 U	0.047 U	0.85 J	1.02 J	0.00075 J	0.0023 U	0.0023 UJ	33 J	11 J	0.0044	0.09 J	0.01663 J	0.0038	0.0021 U	0.0022 U
Total CBTEX	0.0027	0.0019	0.0010 U	0.00081 U	0.096	1.49 J	3.20	0.00209 J	0.00499	0.0023 UJ	50.5 J	20.5 J	0.02096	4.2972	0.0341	0.0207	0.0021 U	0.0022 U
Total CVOC	0.0045	0.10082	0.0182	0.00375	6.5285	1217.51	333.24	2.0948	0.0334	0.00659	0.05 U	0.052 U	0.0048	0.066 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Total VOC	0.01536	0.10393	0.0182	0.00895	7.1678	1231.2	517.41	2.12439	0.05032	0.00743	60.373	27.92	0.03993	4.2972	0.03946	0.02174	0.011 UJ	0.011 UJ

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-083	DPT-083	DPT-083	DPT-083	DPT-083	DPT-083	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	MW-111D
Sample Depth (feet bgs)	5 - 6	11 - 12	18 - 19	24 - 25	37 - 38	37 - 38	9 - 10	14 - 15	18 - 20	22 - 23	27 - 28	18 - 20	35 - 36	44 - 45	49 - 50	2 - 4
Sample Date	8/25/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/13/2016
Sample Type	N	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel
Analyte																
1,1,1,2-Tetrachloroethane	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
1,1,1-Trichloroethane	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
1,1,2,2-Tetrachloroethane	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
1,1,2-Trichloroethane	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.094 U
1,1-Dichloroethane	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.00051 J	0.0011 U	0.00036 J	0.00073 U	0.00086 U	0.094 U
1,1-Dichloroethene	0.00085 U	0.055 U	0.00099 U	0.0024	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.063 U
1,1-Dichloropropene	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.31 U
1,2,3-Trichlorobenzene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,2,3-Trichloropropane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.63 U
1,2,4-Trichlorobenzene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,2,4-Trimethylbenzene	0.14	0.26	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.00046 J	10	0.0010 J	0.0020 U	0.0023 U	0.00043 J	0.0017 U	0.0015 U	0.0017 U	0.25 J
1,2-Dibromo-3-Chloropropane	0.0025 UJ	0.16 UJ	0.0030 UJ	0.0029 UJ	0.0028 UJ	0.0029 UJ	0.0028 U	0.17 U	0.0030 U	0.0031 U	0.0034 U	0.0033 U	0.0026 U	0.0022 U	0.0026 U	0.31 U
1,2-Dibromoethane (Ethylene Dibromide)	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.25 U
1,2-Dichlorobenzene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,2-Dichloroethane	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.063 U
1,2-Dichloroethene, cis-	0.00085 U	0.055 U	0.00086 J	0.044	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0014	0.00027 J	0.00020 J	0.00085 U	0.00073 U	0.00086 U	0.087
1,2-Dichloroethene, Total	0.0013 U	0.082 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.085 U	0.0015 U	0.00014 J	0.00022 J	0.0017 U	0.0013 U	0.0011 U	0.0013 U	0.087
1,2-Dichloroethene, trans-	0.0013 U	0.082 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.085 U	0.0015 U	0.00014 J	0.00022 J	0.0017 U	0.0013 U	0.0011 U	0.0013 U	0.094 U
1,2-Dichloropropane	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.22 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0019	0.1 J	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	2.6	0.00035 J	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.062 J
1,3-Dichlorobenzene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,3-Dichloropropane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,3-Dichloropropene, cis-	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
1,3-Dichloropropene, Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.063 U
1,3-Dichloropropene, trans-	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.063 U
1,4-Dichlorobenzene	0.0017 UJ	0.11 UJ	0.0020 UJ	0.0019 UJ	0.0019 UJ	0.0019 UJ	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
1,4-Dioxane (p-Dioxane)	0.068 UJ	4.4 UJ	0.079 UJ	0.078 UJ	0.076 UJ	0.078 UJ	0.074 U	4.5 U	0.08 U	0.082 U	0.092 U	0.089 U	0.068 U	0.059 U	0.069 U	6.3 U
2,2-Dichloropropane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
2-Chlorotoluene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
2-Hexanone	0.0085 U	0.55 U	0.0099 U	0.0097 U	0.0095 U	0.0097 U	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U
4-Chlorotoluene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
Acetone	0.064	0.55 U	0.0066 J	0.011	0.0095 U	0.0097 U	0.095	0.56 U	0.01 U	0.0050 J	0.0091 J	0.0055 J	0.0085 U	0.0073 U	0.0086 U	0.17 J
Benzene	0.0014	0.03	0.00050 U	0.0018	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.0018	0.0041	0.0052	0.0020	0.0014	0.00037 U	0.00043 U	0.23
Bromobenzene	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
Bromodichloromethane	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
Bromoform	0.0034 U	0.22 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.0037 U	0.23 U	0.0040 U	0.0041 U	0.0046 U	0.0044 U	0.0034 U	0.0029 U	0.0034 U	0.25 U
Bromomethane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.12 U
Butylbenzene, n-	0.0035	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00087 J	0.4	0.0010 U	0.00019 J	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.044 J
Butylbenzene, sec-	0.0044	0.0098 J	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.0019	0.12	0.0010 U	0.00015 J	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.035 J
Butylbenzene, t-	0.00079 J	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.00021 J	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
Carbon Disulfide	0.0085 U	0.55 U	0.0099 U	0.0097 U	0.0095 U	0.0097 U	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	DPT-083	DPT-083	DPT-083	DPT-083	DPT-083	DPT-083	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	DPT-88	MW-111D
Sample Depth (feet bgs)	5 - 6	11 - 12	18 - 19	24 - 25	37 - 38	37 - 38	9 - 10	14 - 15	18 - 20	22 - 23	27 - 28	18 - 20	35 - 36	44 - 45	49 - 50	2 - 4
Sample Date	8/25/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022	8/25/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/18/2022	10/13/2016
Sample Type	N	N	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay	Shallow Sand and Gravel
Analyte																
Carbon Tetrachloride	0.00085 UJ	0.055 UJ	0.00099 UJ	0.00097 UJ	0.00095 UJ	0.00097 UJ	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.063 U
Chlorobenzene	0.00021 J	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.063 U
Chlorobromomethane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.31 U
Chloroethane	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.12 U
Chloroform	0.0013 U	0.082 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.085 U	0.0015 U	0.0015 U	0.0017 U	0.0017 U	0.0013 U	0.0011 U	0.0013 U	0.094 U
Chloromethane	0.0034 U	0.22 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.0037 U	0.23 U	0.0040 U	0.0041 U	0.0046 U	0.0044 U	0.0034 U	0.0029 U	0.0034 U	0.31 U
Dibromochloromethane	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.063 U
Dibromomethane (Methylene Bromide)	0.0017 U	0.11 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.63 U
Dichlorodifluoromethane	0.0085 U	0.55 U	0.0099 U	0.0097 U	0.0095 U	0.0097 U	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U
Ethylbenzene	0.019	0.14	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00024 J	14	0.0012	0.0010 U	0.0011 U	0.00035 J	0.00085 U	0.00073 U	0.00086 U	0.18
Hexachlorobutadiene	0.0034 U	0.22 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.0037 U	0.23 U	0.0040 U	0.0041 U	0.0046 U	0.0044 U	0.0034 U	0.0029 U	0.0034 U	0.31 U
Isopropylbenzene (Cumene)	0.051	0.13	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.013	0.84	0.00029 J	0.00052 J	0.0011 U	0.00061 J	0.00085 U	0.00073 U	0.00086 U	0.075
Methyl Ethyl Ketone (2-Butanone)	0.0075 J	0.55 U	0.0099 U	0.0097 U	0.0095 U	0.0097 U	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0011 J	0.55 U	0.0099 U	0.0097 U	0.0095 U	0.0097 U	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U
Methyl tert-butyl Ether (MTBE)	0.0017 UJ	0.11 UJ	0.0020 UJ	0.0019 UJ	0.0019 UJ	0.0019 UJ	0.0018 U	0.11 U	0.0020 U	0.0020 U	0.0023 U	0.0022 U	0.0017 U	0.0015 U	0.0017 U	0.12 U
Methylene Chloride	0.0042 U	0.27 U	0.0050 U	0.0049 U	0.0048 U	0.0048 U	0.0046 U	0.28 U	0.0050 U	0.0051 U	0.0057 U	0.0055 U	0.0042 U	0.0037 U	0.0043 U	0.63 U
Naphthalene	0.0025 J	0.22 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.00061 J	2.8	0.0040 U	0.0041 U	0.0046 U	0.0044 U	0.0034 U	0.0029 U	0.0034 U	0.41
n-Propylbenzene	0.04	0.045 J	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.016	1.7	0.00034 J	0.00056 J	0.0011 U	0.00067 J	0.00085 U	0.00012 J	0.00086 U	0.12
p-Isopropyltoluene	0.00038 J	0.011 J	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.094	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.019 J
Styrene	0.00085 U	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.12 U
Tetrachloroethene	0.00042 U	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.0015	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	0.024 J
Toluene	0.03	0.055 U	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.81
Trichloroethene	0.00079	0.027 U	0.00050 U	0.00049 U	0.00048 U	0.00048 U	0.00046 U	0.028 U	0.00050 U	0.00051 U	0.00057 U	0.00055 U	0.00042 U	0.00037 U	0.00043 U	10
Trichlorofluoromethane	0.0034 U	0.22 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.0037 U	0.23 U	0.0040 U	0.0041 U	0.0046 U	0.0044 U	0.0034 U	0.0029 U	0.0034 U	0.31 U
Vinyl Acetate	0.0085 UJ	0.55 UJ	0.0099 UJ	0.0097 UJ	0.0095 UJ	0.0097 UJ	0.0092 U	0.56 U	0.01 U	0.01 U	0.011 U	0.011 U	0.0085 U	0.0073 U	0.0086 U	0.63 U
Vinyl Chloride	0.00085 U	0.055 U	0.00099 U	0.0020	0.042	0.039	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.0011	0.0025	0.00086 U	0.12 U
Xylene, m- & p-	0.07	16	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	52	0.0042	0.0020 U	0.0023 U	0.0011 J	0.0017 U	0.0015 U	0.0017 U	0.59
Xylene, o-	0.023	0.017 J	0.00099 U	0.00097 U	0.00095 U	0.00097 U	0.00092 U	6.7	0.00064 J	0.0010 U	0.0011 U	0.0011 U	0.00085 U	0.00073 U	0.00086 U	0.41
Xylenes, Total	0.093	16	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0018 U	58.7	0.00484 J	0.0020 U	0.0023 U	0.0011 J	0.0017 U	0.0015 U	0.0017 U	1
Total CBTEX	0.1944	16.317	0.0020 U	0.0018	0.0019 U	0.0019 U	0.01324	73.54	0.00813	0.00462	0.0052	0.00406	0.0014	0.0015 U	0.0017 U	2.295
Total CVOC	0.00085 U	0.055 U	0.00099 U	0.0020	0.042	0.039	0.00092 U	0.056 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.0011	0.0025	0.00086 U	0.12 U
Total VOC	0.46147	16.7428	0.00746	0.0612	0.042	0.039	0.12979	91.254	0.00982	0.01206	0.0153	0.01086	0.00286	0.00262	0.0086 U	15 J

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-111D	MW-111D	MW-111D	MW-114S	MW-114S	MW-114S	MW-115D	MW-115D	MW-118D	MW-118D	MW-118D	MW-118D	MW-123D	MW-123D	MW-124S	RW-6DR
Sample Depth (feet bgs)	6 - 8	10 - 12	14 - 15	3 - 4	3 - 4	7 - 8	3 - 4	4 - 5	10.5 - 11.5	23 - 24	25 - 26	34 - 36	2 - 4	6 - 8	10 - 12	4 - 6
Sample Date	10/13/2016	10/13/2016	10/13/2016	9/22/2016	9/22/2016	9/22/2016	9/29/2016	9/29/2016	10/3/2017	10/4/2017	10/4/2017	10/4/2017	9/26/2017	9/27/2017	9/10/2019	10/11/2016
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																
1,1,1,2-Tetrachloroethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
1,1,1-Trichloroethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
1,1,2,2-Tetrachloroethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	--	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
1,1,2-Trichloroethane	0.0017 U	0.092 U	5.4 U	0.0018 U	0.0018 U	0.0018 U	0.0014 U	0.17 U	0.0013 U	0.58 U	0.69 U	0.082 U	0.0014 U	0.076 U	0.1 U	0.0018 U
1,1-Dichloroethane	0.0017 U	0.092 U	5.4 U	0.0018 U	0.0018 U	0.0018 U	0.0014 U	0.17 U	0.0013 U	0.58 U	0.69 U	0.082 U	0.0014 U	0.076 U	0.1 U	0.0018 U
1,1-Dichloroethene	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.1 U	0.0012 U
1,1-Dichloropropene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.053 U	0.0061 U
1,2,3-Trichlorobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
1,2,3-Trichloropropane	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	0.21 U	0.012 U
1,2,4-Trichlorobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
1,2,4-Trimethylbenzene	0.0056 U	0.019 J	290	0.00059 J	0.0013 J	0.0012 J	0.0046 U	2.4	0.00033 J	2	2.3 U	0.27 UJ	0.0047 U	0.1 J	3.5	0.0061 U
1,2-Dibromo-3-Chloropropane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 UJ	0.25 UJ	0.32 U	0.0061 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0045 U	0.24 U	14 U	0.0047 U	0.0048 U	0.0049 U	0.0037 U	0.46 U	0.0035 U	1.6 U	1.8 U	0.22 U	0.0037 U	0.2 U	0.1 U	0.0049 U
1,2-Dichlorobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.21 U	0.0061 U
1,2-Dichloroethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.1 U	0.0012 U
1,2-Dichloroethene, cis-	0.0003 J	0.02 J	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.0024	91	65	0.13	0.0035	0.034 J	0.1 U	0.0012 U
1,2-Dichloroethene, Total	0.0003 J	0.02 J	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.0024	91	65	0.13	0.0039 J	0.034 J	0.1 U	0.0012 U
1,2-Dichloroethene, trans-	0.0017 U	0.092 U	5.4 U	0.0018 U	0.0018 U	0.0018 U	0.0014 U	0.17 U	0.0013 U	0.58 U	0.69 U	0.082 U	0.00037 J	0.076 U	0.16 U	0.0018 U
1,2-Dichloropropane	0.0039 U	0.21 U	13 U	0.0041 U	0.0042 U	0.0043 U	0.0032 U	0.4 U	0.0030 U	1.4 U	1.6 U	0.19 U	0.0033 U	0.18 U	0.1 U	0.0043 U
1,3,5-Trimethylbenzene (Mesitylene)	0.0056 U	0.0098 J	72	0.0059 U	0.00061 J	0.00053 J	0.0046 U	1	0.00016 J	0.43 J	2.3 U	0.27 UJ	0.0047 U	0.019 J	0.21 U	0.0061 U
1,3-Dichlorobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
1,3-Dichloropropane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.21 U	0.0061 U
1,3-Dichloropropene, cis-	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
1,3-Dichloropropene, Total	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
1,3-Dichloropropene, trans-	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 UJ	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.1 U	0.0012 U
1,4-Dichlorobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
1,4-Dioxane (p-Dioxane)	0.11 U	6.1 U	360 U	0.12 U	0.12 U	0.12 U	0.093 U	11 U	0.035 UJ	16 UJ	18 UJ	2.2 UJ	0.037 U	2 U	8.4 U	0.12 U
2,2-Dichloropropane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.21 U	0.0061 U
2-Chlorotoluene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
2-Hexanone	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 UJ	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	1 U	0.012 U
4-Chlorotoluene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.21 U	0.0061 U
Acetone	0.011 U	0.61 U	36 U	0.0075 J	0.017	0.016	0.0021 J	1.1 U	0.014 J	3.9 UJ	4.6 UJ	0.54 UJ	0.031	0.5 U	1 U	0.012 U
Benzene	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00058 J	0.39 U	0.46 U	0.57	0.00030 J	0.01 J	0.053 U	0.0012 U
Bromobenzene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.21 U	0.0061 U
Bromodichloromethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
Bromoform	0.0045 U	0.24 U	14 U	0.0047 U	0.0048 U	0.0049 UJ	0.0037 U	0.46 U	0.0035 U	1.6 U	1.8 U	0.22 U	0.0037 U	0.2 U	0.42 U	0.0049 U
Bromomethane	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.079 J	0.0017 U	0.78 U	0.92 U	0.11 U	0.0019 U	0.1 U	0.21 U	0.0024 U
Butylbenzene, n-	0.0011 U	0.023 J	5.2	0.0012 U	0.0012 U	0.0012 UJ	0.00093 U	0.25	0.00087 U	0.39 U	0.46 U	0.054 UJ	0.00093 U	0.014 J	0.26	0.0012 U
Butylbenzene, sec-	0.0011 U	0.04 J	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11	0.00087 U	0.39 U	0.46 U	0.054 UJ	0.00093 U	0.016 J	0.12	0.0012 U
Butylbenzene, t-	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.016 J	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.018 J	0.0061 U
Carbon Disulfide	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	1 U	0.012 U

Table 2-2a. Historical Soil Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	MW-111D	MW-111D	MW-111D	MW-114S	MW-114S	MW-114S	MW-115D	MW-115D	MW-118D	MW-118D	MW-118D	MW-118D	MW-123D	MW-123D	MW-124S	RW-6DR
Sample Depth (feet bgs)	6 - 8	10 - 12	14 - 15	3 - 4	3 - 4	7 - 8	3 - 4	4 - 5	10.5 - 11.5	23 - 24	25 - 26	34 - 36	2 - 4	6 - 8	10 - 12	4 - 6
Sample Date	10/13/2016	10/13/2016	10/13/2016	9/22/2016	9/22/2016	9/22/2016	9/29/2016	9/29/2016	10/3/2017	10/4/2017	10/4/2017	10/4/2017	9/26/2017	9/27/2017	9/10/2019	10/11/2016
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Analyte																
Carbon Tetrachloride	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.1 U	0.0012 U
Chlorobenzene	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.053 U	0.0012 U
Chlorobromomethane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.21 U	0.0061 U
Chloroethane	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.23 U	0.0017 U	0.78 U	0.92 U	0.11 UJ	0.0019 U	0.1 U	0.21 U	0.0024 U
Chloroform	0.0017 U	0.092 U	5.4 U	0.0018 U	0.0018 U	0.0018 U	0.0014 U	0.17 U	0.0013 U	0.58 U	0.69 U	0.082 U	0.0014 U	0.076 U	0.16 U	0.0018 U
Chloromethane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.25 U	0.42 U	0.0061 U
Dibromochloromethane	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 UJ	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05 U	0.1 U	0.0012 U
Dibromomethane (Methylene Bromide)	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	0.21 U	0.012 U
Dichlorodifluoromethane	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 UJ	0.5 UJ	1 U	0.012 U
Ethylbenzene	0.0011 U	0.061 U	1.4 J	0.0012 U	0.0012 U	0.00022 J	0.00093 U	0.38	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.1	0.041 J	0.0012 U
Hexachlorobutadiene	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 UJ	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.42 U	0.0061 U
Isopropylbenzene (Cumene)	0.0011 U	0.011 J	6.3	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.18	0.00087 U	0.39 U	0.46 U	0.054 UJ	0.00093 U	0.04 J	0.19	0.0012 U
Methyl Ethyl Ketone (2-Butanone)	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 UJ	3.9 UJ	4.6 UJ	0.54 UJ	0.0093 UJ	0.5 UJ	1 UJ	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.011 U	0.61 U	36 U	0.012 UJ	0.012 UJ	0.012 UJ	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	1 U	0.012 U
Methyl tert-butyl Ether (MTBE)	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.23 U	0.0017 U	0.78 U	0.92 U	0.11 U	0.0019 U	0.1 U	0.21 U	0.0024 U
Methylene Chloride	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 U	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	0.53 U	0.012 U
Naphthalene	0.0056 U	0.3 U	18 U	0.001 J	0.0013 J	0.0012 J	0.0046 U	0.12 J	0.0043 U	1.9 U	2.3 U	0.27 U	0.0047 U	0.18 J	0.32 J	0.0061 U
n-Propylbenzene	0.0011 U	0.0079 J	47	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.57	0.00087 U	0.25 J	0.46 U	0.054 UJ	0.00093 U	0.071	0.8	0.0012 U
p-Isopropyltoluene	0.0011 U	0.061 U	3.8	0.0012 U	0.0012 U	0.00077 J	0.00093 U	0.16	0.00087 U	0.39 U	0.46 U	0.054 UJ	0.00093 U	0.037 J	0.16	0.0012 U
Styrene	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.23 U	0.0017 U	0.78 U	0.92 U	0.11 U	0.0019 U	0.1 U	0.1 U	0.0024 U
Tetrachloroethene	0.0011 U	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.00087 U	0.39 U	0.46 U	0.054 U	0.00093 U	0.05	0.053 U	0.0012 U
Toluene	0.0017 U	0.092 U	5.4 U	0.0018 U	0.00031 J	0.00042 J	0.0014 U	0.17 U	0.0013 U	0.083 J	0.69 U	0.082 U	0.0014 U	0.15	0.1 U	0.0018 U
Trichloroethene	0.0055	0.061 U	3.6 U	0.0012 U	0.0012 U	0.0012 U	0.00093 U	0.11 U	0.012	0.39 U	0.46 U	0.047 J	0.00070 J	0.63	0.053 U	0.0017
Trichlorofluoromethane	0.0056 U	0.3 U	18 U	0.0059 U	0.006 U	0.0061 U	0.0046 U	0.57 U	0.0043 U	1.9 U	2.3 U	0.27 UJ	0.0047 U	0.25 U	0.42 U	0.0061 U
Vinyl Acetate	0.011 U	0.61 U	36 U	0.012 U	0.012 U	0.012 UJ	0.0093 U	1.1 U	0.0087 U	3.9 U	4.6 U	0.54 U	0.0093 U	0.5 U	1 U	0.012 U
Vinyl Chloride	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.23 U	0.0017 U	0.14 J	1	0.024 J	0.00068 J	0.1 U	0.1 U	0.0024 U
Xylene, m- & p-	0.0022 U	0.12 U	5.6 J	0.001 J	0.0015 J	0.0018 J	0.0018 U	3	0.00035 J	0.3 J	0.19 J	0.11 U	0.0019 U	0.22	0.21 U	0.0024 U
Xylene, o-	0.0022 U	0.12 U	2.1 J	0.0023 U	0.0015 J	0.0016 J	0.0018 U	0.04 J	0.0017 U	0.2 J	0.92 U	0.11 U	0.0019 U	0.18 J	0.1 U	0.0024 U
Xylenes, Total	0.0022 U	0.12 U	7.7 J	0.001 J	0.003 J	0.0034 J	0.0018 U	3 J	0.00035 J	0.5 J	0.19 J	0.11 U	0.0019 U	0.4	0.1 U	0.0024 U
Total CBTEX	0.0022 U	0.011	15.4	0.001 J	0.00331 J	0.00404 J	0.0018 U	3.56	0.00093 J	0.583 J	0.19 J	0.57	0.0003 J	0.7 J	0.23 J	0.0024 U
Total CVOC	0.0022 U	0.12 U	7.3 U	0.0023 U	0.0024 U	0.0024 U	0.0018 U	0.23 U	0.0144	91.14 J	66	0.201 J	0.00525 J	0.714 J	1 U	0.0017
Total VOC	0.0061 J	0.15 J	440 J	0.011 J	0.027 J	0.027 J	0.0021 J	15 J	0.02982 J	94.403 J	66.19 J	0.771 J	0.03655 J	1.851 J	5.4 J	0.0017

Table 2-2a. Historical Soil Data: Volatile
Organic Compounds

Essex-Hope Site, Jamestown, New York

Note:

Bold indicates detection

bgs = below ground surface

CBTEX = cumene, benzene, toluene, ethylbenzene, and total xylenes

CVOC = chlorinated volatile organic compound

FD = field duplicate

ID = identifier

J = estimated detection

mg/kg = milligram(s) per kilogram

N = normal sample

U = analyte not detected

VOC = volatile organic compound

Table 2-2b. Historical Soil Data: Polychlorinated Biphenyls

Essex-Hope Site, Jamestown, New York

Location ID	DPT-005A	DPT-005A	DPT-005A	DPT-005B	DPT-005B	DPT-005B	DPT-005C	DPT-005C	DPT-005C	DPT-005C	MW-123D	MW-123D
Sample Date	9/20/2017	9/20/2017	9/20/2017	9/19/2017	9/19/2017	9/20/2017	9/25/2017	9/26/2017	9/20/2017	9/20/2017	9/26/2017	9/27/2017
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Sand and Gravel
Sample Type	N	N	N	N	FD	N	N	N	N	N	N	N
Sample Depth (feet bgs)	2 - 4	5 - 7	16 - 17	2 - 4	2 - 4	5 - 7	2 - 4	5 - 7	2 - 4	5 - 7	2 - 4	6 - 8
Analyte												
Arochlor, Total (PCB)	0.753	0.546	0.47	0.862	0.588	0.816	0.176 J	0.34	0.894	0.0349 U	0.293	0.0561
Aroclor-1016	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1221	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1232	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1242	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1248	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1254	0.613	0.447	0.408	0.727	0.484	0.658	0.138	0.34	0.724	0.0349 U	0.237	0.0561
Aroclor-1260	0.14	0.0989	0.0624	0.135	0.104	0.158 J	0.0375 J	0.0380 U	0.17	0.0349 U	0.0561	0.0361 U
Aroclor-1262	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U
Aroclor-1268	0.0771 U	0.0384 U	0.0382 U	0.0723 U	0.0720 U	0.0395 U	0.0376 U	0.0380 U	0.0774 U	0.0349 U	0.0385 U	0.0361 U

Notes:
All results in mg/kg
Bold indicates detection
FD = field duplicate
ID = identifier
J = estimated detection
mg/kg = milligram(s) per kilogram
N = normal sample
U = analyte not detected

Table 2-2c. Historical Soil Data: General Chemistry
Essex-Hope Site, Jamestown, New York

Location ID		DPT-001	DPT-001	DPT-001	DPT-002	DPT-002	DPT-003	DPT-003	DPT-004	DPT-004	DPT-004	DPT-005	DPT-005	DPT-006	DPT-006	DPT-007
Sample Date		9/19/2016	9/19/2016	9/19/2016	9/20/2016	9/20/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/19/2016	9/21/2016
Sample Type		N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N
Sample Depth (feet)		3 - 4	6 - 7	9 - 10	3 - 4	6 - 8	2 - 3	6 - 8	2 - 3	2 - 3	6 - 7	3 - 4	5 - 6	3 - 4	7 - 8	18 - 19
Analyte	Unit															
Moisture, Percent	%	17.2	13.8	12.5	8.2	20	22.2	8.6	19	15.8	12.5	12.4	17.9	21.4	9.2	21.1
pH	pH Unit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Organic Carbon %C	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note:
Bold indicates detection.
FD = field duplicate
ID = identifier
N = normal

Table 2-2c. Historical Soil Data: General Chemistry
Essex-Hope Site, Jamestown, New York

Location ID		DPT-007	DPT-007	DPT-007	DPT-008	DPT-009	DPT-029	DPT-029	DPT-029	DPT-036	DPT-036	DPT-036	DPT-042	DPT-042	DPT-042	DPT-045
Sample Date		9/21/2016	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/26/2019	9/26/2019	9/26/2019	9/18/2019	9/18/2019	9/18/2019	9/25/2019	9/25/2019	9/25/2019	9/24/2019
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Depth (feet)		22 - 23	33 - 34	34 - 36	38 - 39	30 - 32	10 - 12	18 - 20	20 - 22	10 - 12	20 - 22	22 - 24	10 - 12	16 - 18	20 - 22	10 - 12
Analyte	Unit															
Moisture, Percent	%	23.7	24.6	23.3	22.4	20.8	--	--	--	--	--	--	--	--	--	--
pH	pH Unit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Organic Carbon %C	%	--	--	--	--	--	0.104	0.740	0.506	0.068	0.454	0.300	0.134	0.851	0.731	0.148

Note:
Bold indicates detection.
FD = field duplicate
ID = identifier
N = normal

Table 2-2c. Historical Soil Data: General Chemistry
Essex-Hope Site, Jamestown, New York

Location ID		DPT-045	DPT-045	DPT-048	DPT-048	DPT-048	DPT-050	DPT-050	DPT-050	MW-106D	MW-106D	MW-106D	MW-106D	MW-107S	MW-111D
Sample Date		9/24/2019	9/24/2019	9/17/2019	9/17/2019	9/17/2019	9/23/2019	9/23/2019	9/23/2019	10/5/2016	10/5/2016	10/5/2016	10/5/2016	10/19/2016	10/13/2016
Sample Type		N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Depth (feet)		17 - 19	22 - 24	10 - 12	18 - 20	20 - 22	10 - 12	18 - 20	22 - 24	8 - 10	16 - 18	32 - 34	44 - 46	5 - 16	2 - 4
Analyte	Unit														
Moisture, Percent	%	--	--	--	--	--	--	--	--	10.2	23.6	21.6	19	12.8	12.2
pH	pH Unit	--	--	--	--	--	--	--	--	6.7	8.4	8.5	8.9	8	--
Total Organic Carbon %C	%	0.850	0.669	0.291	1.68	0.643	0.104	0.753	0.787	0.091	0.851	0.677	0.748	0.135	--

Note:
Bold indicates detection.
FD = field duplicate
ID = identifier
N = normal

Table 2-2c. Historical Soil Data: General Chemistry
Essex-Hope Site, Jamestown, New York

Location ID		MW-111D	MW-111D	MW-111D	MW-111D	MW-111D	MW-114S	MW-114S	MW-114S	MW-115D	MW-115D	RW-6DR	RW-6DR	RW-6DR	RW-6DR
Sample Date		10/13/2016	10/13/2016	10/13/2016	10/13/2016	10/13/2016	9/22/2016	9/22/2016	9/22/2016	9/29/2016	9/29/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016
Sample Type		N	N	N	N	N	N	FD	N	N	N	N	N	N	N
Sample Depth (feet)		6 - 8	10 - 12	14 - 15	22 - 24	48 - 50	3 - 4	3 - 4	7 - 8	3 - 4	4 - 5	4 - 6	8 - 10	18 - 20	30 - 32
Analyte	Unit														
Moisture, Percent	%	11	16.4	20.8	23.2	17.6	5.4	5.4	9.2	13	13.2	9.5	8	21.7	21.2
pH	pH Unit	--	7.8	--	7.8	8.4	--	--	--	--	--	--	4.8	8.1	7.9
Total Organic Carbon %C	%	--	0.232	--	0.073	0.247	--	--	--	--	--	--	0.221	0.214	0.063

Note:
Bold indicates detection.
FD = field duplicate
ID = identifier
N = normal

Table 2-2c. Historical Soil Data: General Chemistry

Essex-Hope Site, Jamestown, New York

Location ID		RW-6DR
Sample Date		10/11/2016
Sample Type		N
Sample Depth (feet)		44 - 46
Analyte	Unit	
Moisture, Percent	%	23.7
pH	pH Unit	8.3
Total Organic Carbon %C	%	0.157

Note:

Bold indicates detection.

FD = field duplicate

ID = identifier

N = normal

Table 2-2d. Historical Soil Data: Geotechnical

Essex-Hope Site, Jamestown, New York

Location ID	DPT-029	DPT-029	DPT-029	DPT-036	DPT-036	DPT-036	DPT-042	DPT-042	DPT-042	DPT-045	DPT-045	DPT-045	DPT-048	DPT-048	DPT-048	DPT-050	DPT-050
Sample Date	9/26/2019	9/26/2019	9/26/2019	9/18/2019	9/18/2019	9/18/2019	9/25/2019	9/25/2019	9/25/2019	9/24/2019	9/24/2019	9/24/2019	9/17/2019	9/17/2019	9/17/2019	9/23/2019	9/23/2019
Operable Unit	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Depth (feet)	10 - 12	18 - 20	20 -22	10 - 12	20 -22	22 - 24	10 - 12	16 - 18	20 -22	10 - 12	17 - 19	22 - 24	10 - 12	18 - 20	20 -22	10 - 12	18 - 20
Analyte	Unit																
Bulk Density	lb/ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Density	lb/ft	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Liquid Limit	none	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plastic Index	none	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Plastic Limit	none	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Clay	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobbles(> 6 cm)	%	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Fines, Total (Silt and Clay)	%	12.0	98.5	95.2	12.7	98.4	78.8	14.2	99.5	74.2	10.5	98.8	97.6	9.60	94.8	73.2	17.5
Gravel, Coarse	%	0.100 U	0.100 U	0.100 U	27.8	0.100 U	5.80	20.7	0.100 U	0.100 U	25.1	0.100 U	0.100 U	34.6	0.300	0.100 U	20.4
Gravel, Fine	%	51.3	0.100 U	0.100 U	26.7	0.100 U	3.20	23.3	0.100 U	0.100 U	26.7	0.100 U	0.100 U	26.4	0.300	0.100 U	22.6
Gravel, Total	%	51.3	0.100 U	0.100 U	54.5	0.100 U	9.00	44.0	0.100 U	0.100 U	51.8	0.100 U	0.100 U	61.0	0.600	0.100 U	43.0
Sand, Coarse	%	16.7	0.200	0.100 U	14.3	0.100	0.100 U	15.4	0.100 U	0.100 U	16.6	0.100 U	0.100	10.1	0.500	0.100	14.4
Sand, Fine	%	5.20	0.400	4.70	6.60	0.700	12.1	8.70	0.300	25.5	5.40	0.500	2.30	5.90	1.50	26.5	8.20
Sand, Medium	%	14.8	0.900	0.100	11.9	0.800	0.100	17.7	0.200	0.300	15.7	0.700	0.100 U	13.4	2.60	0.200	16.9
Sand, Total	%	36.7	1.50	4.80	32.8	1.60	12.2	41.8	0.500	25.8	37.7	1.20	2.40	29.4	4.60	26.8	39.5
Silt	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve 0.75 inch (19000 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve 3 inch (75000 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve No. 10 (2000 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve No. 200 (75 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve No. 4 (4750 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sieve No. 40 (425 microns), Percent Passing	%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note:

Bold indicates detection.

cm = centimeter(s)

FD = field duplicate

lb/ft³ = pound(s) per cubic foot

N = normal

Table 2-2d. Historical Soil Data: Geotechnical

Essex-Hope Site, Jamestown, New York

Location ID	DPT-050	MW-106D	MW-106D	MW-106D	MW-106D	MW-107S	MW-111D	MW-111D	MW-111D	MW-124S	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR
Sample Date	9/23/2019	10/5/2016	10/5/2016	10/5/2016	10/5/2016	10/19/2016	10/13/2016	10/13/2016	10/13/2016	9/10/2019	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016
Operable Unit	OU-01	OU-03	OU-03	OU-03	OU-03	OU-03	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Silty Clay	Deep Sandy Silt	Deep Sandy Clay	Shallow Sand and Gravel	Shallow Sand and Gravel	Deep Sandy Silt	Deep Sandy Silt	Shallow Sand and Gravel	Shallow Sand and Gravel	Shallow Silty Clay	Shallow Silty Clay	Shallow Silty Clay	Deep Sandy Silt
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Sample Depth (feet)	22 - 24	8-10	16 - 18	32 - 34	44 - 46	5-16	10 - 12	22 - 24	48 - 50	10 - 12	8 - 10	18 - 20	20 -22	22 - 24	24 - 26
Analyte	Unit														
Bulk Density	lb/ft	--	86.28	91.65	101.7	98.12	91.07	102.2	99.85	93.02	--	92.23	97.93	--	--
Density	lb/ft	--	96.61	117.6	124.9	122.4	102.8	114.8	124.4	112	--	100.4	123.9	--	--
Liquid Limit	none	--	28	40	20	36	30	30	21	31	--	23	35	--	--
Moisture	%	--	12	28.3	22.7	24.7	12.8	12.3	24.6	20.4	--	8.91	26.6	--	--
Plastic Index	none	--	8	17	0 U	17	7	13	0 U	12	--	6	14	--	--
Plastic Limit	none	--	20	23	20	19	23	17	22	19	--	17	21	--	--
Clay	%	--	1.7	45.3	8.1	55.1	1.3	0.7	6.1	24.8	--	1	59.1	40.8	41.3
Cobbles(> 6 cm)	%	0.100 U	--	--	--	--	--	--	--	--	0.100 U	--	--	--	--
Fines, Total (Silt and Clay)	%	87.5	19.5	99.7	84.3	92.3	21.4	27.6	91.5	85.9	14.1	11.9	100	99.8	99.2
Gravel, Coarse	%	0.100 U	--	--	--	--	--	--	--	--	25.8	--	--	--	--
Gravel, Fine	%	0.100 U	--	--	--	--	--	--	--	--	25.5	--	--	--	--
Gravel, Total	%	0.100 U	36.8	0.1 U	0.1 U	4	20.9	32.1	0.1 U	2.3	51.3	57	0.1 U	0.1 U	0.1 U
Sand, Coarse	%	0.100 U	--	--	--	--	--	--	--	--	14.6	--	--	--	--
Sand, Fine	%	12.4	--	--	--	--	--	--	--	--	6.30	--	--	--	--
Sand, Medium	%	0.100	--	--	--	--	--	--	--	--	13.7	--	--	--	--
Sand, Total	%	12.5	43.7	0.3	15.7	3.7	57.7	40.3	8.5	11.8	34.6	31.1	0.1 U	0.2	0.8
Silt	%	--	17.8	54.4	76.2	37.2	20.1	26.9	85.4	61.1	--	10.9	40.9	59	57.9
Sieve 0.75 inch (19000 microns), Percent Passing	%	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	--	13.6	0.1 U	0.1 U	0.1 U
Sieve 3 inch (75000 microns), Percent Passing	%	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	--	0.1 U	0.1 U	0.1 U	0.1 U
Sieve No. 10 (2000 microns), Percent Passing	%	--	19	0.1 U	0.1 U	0.3	24.4	16.3	0.1 U	1.4	--	11.7	0.1 U	0.1 U	0.1 U
Sieve No. 200 (75 microns), Percent Passing	%	--	7.8	0.2	15.6	2.6	10.4	7.5	8.5	8.2	--	5.8	0.1 U	0.2	0.8
Sieve No. 4 (4750 microns), Percent Passing	%	--	36.8	0.1 U	0.1 U	4	20.9	32.1	0.1 U	2.3	--	43.4	0.1 U	0.1 U	0.1 U
Sieve No. 40 (425 microns), Percent Passing	%	--	16.9	0.1	0.1	0.8	22.9	16.5	0.1 U	2.2	--	13.6	0.1 U	0.1 U	0.1 U

Note:
Bold indicates detection.
cm = centimeter(s)
FD = field duplicate
lb/ft³ = pound(s) per cubic foot
N = normal

Table 2-2d. Historical Soil Data: Geotechnical

Essex-Hope Site, Jamestown, New York

Location ID	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR	RW-6DR
Sample Date	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016
Operable Unit	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01	OU-01
Geologic Unit	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Sandy Silt	Deep Silty Clay
Sample Type	N	N	FD	N	N	N	N	N	N	N	N	N
Sample Depth (feet)	26 - 28	28 - 30	30 - 32	30 - 32	32 - 34	34 - 36	36 - 38	38 - 40	40 - 42	42 - 43	44 - 46	
Analyte	Unit											
Bulk Density	lb/ft	--	--	--	100.3	--	--	--	--	--	--	86.97
Density	lb/ft	--	--	--	124.2	--	--	--	--	--	--	113.7
Liquid Limit	none	--	--	--	20	--	--	--	--	--	--	31
Moisture	%	--	--	--	23.8	--	--	--	--	--	--	30.7
Plastic Index	none	--	--	--	0 U	--	--	--	--	--	--	12
Plastic Limit	none	--	--	--	23	--	--	--	--	--	--	19
Clay	%	15.3	13.5	12.5	8.5	7.6	5.9	12.5	8.7	7.4	10.2	53.3
Cobbles(> 6 cm)	%	--	--	--	--	--	--	--	--	--	--	--
Fines, Total (Silt and Clay)	%	85.8	90	88	83.4	88	88.3	92.5	83.7	92.4	92.8	98.7
Gravel, Coarse	%	--	--	--	--	--	--	--	--	--	--	--
Gravel, Fine	%	--	--	--	--	--	--	--	--	--	--	--
Gravel, Total	%	0.1 U	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sand, Coarse	%	--	--	--	--	--	--	--	--	--	--	--
Sand, Fine	%	--	--	--	--	--	--	--	--	--	--	--
Sand, Medium	%	--	--	--	--	--	--	--	--	--	--	--
Sand, Total	%	14.2	9.8	12	16.6	12	11.7	7.5	16.3	7.6	7.2	1.3
Silt	%	70.5	76.5	75.5	74.9	80.4	82.4	80	75	85	82.6	45.4
Sieve 0.75 inch (19000 microns), Percent Passing	%	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sieve 3 inch (75000 microns), Percent Passing	%	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sieve No. 10 (2000 microns), Percent Passing	%	0.1	0.3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Sieve No. 200 (75 microns), Percent Passing	%	14	9.4	12	16.6	12	11.7	7.5	16.3	7.6	7.2	1.1
Sieve No. 4 (4750 microns), Percent Passing	%	0.1 U	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sieve No. 40 (425 microns), Percent Passing	%	0.1	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1

Note:
Bold indicates detection.
cm = centimeter(s)
FD = field duplicate
lb/ft³ = pound(s) per cubic foot
N = normal

Table 2-3. Historical Air Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	HH-01	HH-02	HH-03	HH-04	HH-04	HH-05	HH-06	HH-07	IA-01	IA-01	IA-02	IA-03	IA-04	IA-05	IA-06	JMF-01	JMF-01	JMF-01
Sample Date	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	11/15/2018	2/25/2021	2/25/2021	2/25/2021	2/25/2021	2/25/2021	2/25/2021	2/25/2021	11/14/2018	11/14/2018	11/19/2019
Sample Type	N	N	N	N	FD	N	N	N	N	FD	N	N	N	N	N	N	FD	N
Analyte																		
1,1-Dichloroethene	1.77 U	1.73 U	1.71 U	1.93 U	1.90 U	1.78 U	3.53 U	1.68 U	0.079 U	0.079 U	0.23	0.087	0.079 U	0.083	0.083	1.97 U	1.95 U	1.62 U
1,2-Dichloroethene, cis-	11.8	6.90	7.33	4.96	4.64	2.20	26.0	6.98	--	--	--	--	--	--	--	6.78	6.22	3.50
1,2-Dichloroethene, trans-	1.77 U	1.73 U	1.71 U	1.93 U	1.90 U	1.78 U	3.53 U	1.68 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	0.079 U	1.97 U	1.95 U	1.62 U
Tetrachloroethene	24.4	43.5	2.93 U	102	101	31.3	9.90	4.58	0.244	0.231	0.454	0.278	0.292	0.292	0.332	10.4	9.90	4.76
Trichloroethene	33.0	16.7	23.1	14.5	14.0	17.0	1320	473	--	--	--	--	--	--	--	17.8	17.5	49.4 J
Vinyl Chloride	1.14 U	1.12 U	1.10 U	1.24 U	1.23 U	1.15 U	2.28 U	1.08 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051	1.27 U	1.26 U	1.04 U

Notes:
All results in µg/m³.
Bold indicates detection.
µg/m³ = microgram(s) per cubic meter
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected

Table 2-3. Historical Air Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	JMF-01	JMF-02	JMF-02	JMF-03	JMF-03	JMF-04	JMF-04	OA-01	OA-02	RES1	SS-01	SS-02	SS-03	SS-04	SS-05	SS-05	SS-06	SS-07
Sample Date	11/19/2019	11/14/2018	11/19/2019	11/14/2018	11/19/2019	11/14/2018	11/19/2019	2/25/2021	2/25/2021	4/19/2017	2/24/2021	2/24/2021	2/24/2021	2/24/2021	2/24/2021	2/24/2021	2/24/2021	2/24/2021
Sample Type	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	N
Analyte																		
1,1-Dichloroethene	1.64 U	1.71 U	1.89 U	1.82 U	1.95 U	1.80 U	1.86 U	0.079 U	0.079 U	--	1.6 UJ	2.06 U	2.05 U	1.97 U	1.59 U	2.03 U	3.22 U	1.6 U
1,2-Dichloroethene, cis-	3.19	4.40	3.58	11.2	4.36	8.45	5.00	--	--	4.76	1.6 UJ	2.06 U	2.05 U	1.97 U	1.59 U	2.03 U	73	4.24
1,2-Dichloroethene, trans-	1.64 U	1.71 U	1.89 U	1.82 U	1.95 U	1.80 U	1.86 U	0.079 U	0.079 U	--	1.6 UJ	2.06 U	2.05 U	1.97 U	1.59 U	2.03 U	3.65	1.6 U
Tetrachloroethene	5.02	2.93 U	10.2	8.68	6.24	14.9	6.85	0.136 U	0.136 U	--	21.5 J	18.6	3.5 U	73.9	3.21	3.47 U	19.2	2.73 U
Trichloroethene	27.0 J	13.0	17.1	23.1	20.9	21.5	15.8	--	--	46.4	3.79 J	2.79 U	2.77 U	2.67 U	8.38	10	1540	354
Vinyl Chloride	1.06 U	1.10 U	1.22 U	1.17 U	1.26 U	1.16 U	1.20 U	0.051 U	0.051 U	--	1.03 UJ	1.33 U	1.32 U	2.94	1.81	1.31 U	2.07 U	1.03 U

Notes:
All results in µg/m³.
Bold indicates detection.
µg/m³ = microgram(s) per cubic meter
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected

Table 2-3. Historical Air Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	SV-01	SV-01	SV-02	SV-02	SV-03	SV-03	SV-04	SV-04	SV-05	SV-05	SV-06	SV-06	SV-07	SV-07	SV-07	SV-07	SV-08
Sample Date	12/11/2018	11/19/2019	12/11/2018	11/19/2019	12/11/2018	11/20/2019	12/12/2018	11/21/2019	12/12/2018	11/20/2019	12/12/2018	11/20/2019	12/12/2018	12/12/2018	11/21/2019	11/21/2019	12/12/2018
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N
Analyte																	
1,1-Dichloroethene	1.80 U	1.60 U	1.74 U	1.61 U	1.80 U	1.61 U	1.76 U	1.61 U	1.67 U	1.66 U	2.53	1.62 U	1.79 U	1.80 U	1.85 U	1.70 U	1.73 U
1,2-Dichloroethene, cis-	1.80 U	1.60 U	1.74 U	1.61 U	1.80 U	4.60	1.76 U	1.61 U	1.67 U	2.11	1.72 U	1.62 U	5.71 J	3.68 J	2.63	2.00	1.73 U
1,2-Dichloroethene, trans-	1.80 U	1.60 U	1.74 U	1.61 U	1.80 U	1.61 U	1.76 U	1.61 U	1.67 U	1.66 U	1.72 U	1.62 U	1.79 U	1.80 U	1.85 U	1.70 U	1.73 U
Tetrachloroethene	16.2	18.3	15.7	16.5	390	391	3.01 U	2.76 U	16.3	11.2	7.05	6.41	3.07 UJ	8.88 J	3.16 U	2.90 U	2.96 U
Trichloroethene	262	399	2.35 U	3.00	2.45 U	12.4	3.27	5.12	2.26 U	6.40	44.1	9.57	18.3 J	7.79 J	8.60	7.26	2.71
Vinyl Chloride	1.16 U	1.03 U	1.12 U	1.04 U	1.16 U	1.04 U	1.13 U	1.04 U	1.08 U	1.07 U	1.11 U	1.04 U	2.24 J	1.16 UJ	1.61	1.09 U	1.12 U

Notes:
All results in µg/m³.
Bold indicates detection.
µg/m³ = microgram(s) per cubic meter
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected

Table 2-3. Historical Air Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	SV-08	SV-09	SV-09	SV-10	SV-10	SV-10	SV-10	SV-11	SV-11	SV-12	SV-12	SV-13	SV-14	SV-14	SV-15	SV-15	SV-16
Sample Date	11/20/2019	12/12/2018	11/20/2019	12/13/2018	12/13/2018	11/20/2019	11/20/2019	12/12/2018	11/20/2019	12/12/2018	11/20/2019	12/12/2018	12/13/2018	11/21/2019	12/13/2018	11/21/2019	12/13/2018
Sample Type	N	N	N	N	FD	N	FD	N	N	N	N	N	N	N	N	N	N
Analyte																	
1,1-Dichloroethene	1.61 U	1.71 U	1.77 U	1.80 U	1.80 U	1.83 U	1.76 U	1.70 U	1.76 U	1.71 U	1.76 U	1.74 U	1.70 U	1.78 U	1.76 U	1.82 U	1.76 U
1,2-Dichloroethene, cis-	1.61 U	1.71 U	1.77 U	4.76 J	8.76 J	4.44	3.54	1.70 U	1.76 U	1.72	1.76 U	1.74 U	2.27	1.78 U	2.20	1.82 U	2.67
1,2-Dichloroethene, trans-	1.61 U	1.71 U	1.77 U	1.80 U	1.80 U	1.83 U	1.76 U	1.70 U	1.76 U	1.71 U	1.76 U	1.74 U	1.70 U	1.78 U	1.76 U	1.82 U	1.76 U
Tetrachloroethene	2.76 U	3.57	4.47	3.08 UJ	35.3 J	3.13 U	3.01 U	2.92 U	3.01 U	2.93 U	3.02 U	2.97 U	2.91 U	3.04 U	3.01 U	3.11 U	6.63
Trichloroethene	9.67	8.81	5.07	5.75 J	10.5 J	13.1	11.0	4.77	8.87	6.45	22.0	2.35 U	4.74	3.61	2.39 U	2.47 U	111
Vinyl Chloride	1.04 U	1.10 U	1.14 U	3.02 J	6.03 J	2.06	1.77	1.10 U	1.13 U	1.10 U	1.14 U	1.12 U	1.10 U	1.15 U	1.13 U	1.17 U	1.13 U

Notes:
All results in µg/m³.
Bold indicates detection.
µg/m³ = microgram(s) per cubic meter
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected

Table 2-3. Historical Air Data: Volatile Organic Compounds

Essex-Hope Site, Jamestown, New York

Location ID	SV-16	WMS-SE-01	WMS-SE-01	WMS-SE-02	WMS-SE-02	WMS-SE-03	WMS-SE-03	WMS-SE-04	WMS-SE-04	WMS-SE-05	WMS-SE-05	WMS-SE-06	WMS-SE-06	WMS-SE-06
Sample Date	11/21/2019	11/16/2018	11/22/2019	11/16/2018	11/22/2019	11/16/2018	11/22/2019	11/16/2018	11/22/2019	11/16/2018	11/22/2019	11/16/2018	11/22/2019	11/22/2019
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	FD
Analyte														
1,1-Dichloroethene	1.76 U	26 U	27 U	26 U	27 U	26 U	27 U	26 U	27 U	26 U	27 U	26 U	27 U	27 U
1,2-Dichloroethene, cis-	1.76 U	4.8 U	5.0 U	140	35	4.8 U	5.0 U	25	8.7	4.9 U	5.0 U	4.9 U	5.0 U	5.0 U
1,2-Dichloroethene, trans-	1.76 U	11 U	12 U	11 U	12 U	11 U	12 U	12 U	12 U	12 U	12 U	12 U	12 U	12 U
Tetrachloroethene	7.73	2.3 U	0.54 J	0.94 J	0.80 J	2.4 U	0.33 J	2.4 U	0.46 J	2.4 U	0.41 J	2.4 U	1.3 J	2.4 U
Trichloroethene	169	3.5 U	3.6 U	94	150	3.5 U	3.7 U	26	34	3.6 U	3.6 U	3.6 U	1.6 J	1.8 J
Vinyl Chloride	1.14 U	30 U	32 U	30 U	32 U	31 U	32 U	31 U	32 U	31 U	32 U	31 U	32 U	32 U

Notes:
All results in µg/m³.
Bold indicates detection.
µg/m³ = microgram(s) per cubic meter
FD = field duplicate
ID = identifier
J = estimated detection
N = normal sample
U = analyte not detected

Table 3-1. Existing Remedial Action Objectives and Proposed Standards, Criteria, and Guidance
Essex-Hope Site, Jamestown, New York

COC	1994 ROD		Soil SCGs 6 NYCRR 375 Table 375-6.8(b)			Groundwater SCGs 6 NYCRR Part 703.5 Table 1/ TOGS 1.1.1	Proposed Updated SCGs	
	Soil RAOs (ppm)	Groundwater RAOs (ppb)	Restricted Use SCOs: Commercial (ppm)	Restricted Use SCOs: Industrial (ppm)	Protection of Groundwater (ppm)	Groundwater AWQS and Guidance Values (µg/L)	Soil Protection of Groundwater (ppm)	Groundwater AWQS (µg/L)
Volatile Organic Compounds (VOCs) ^[a]								
Acetone	1	--	500 ^[e]	1000 ^[f]	0.05	50 ^[h]	0.05	NC
Benzene	1	1 ^[c]	44	89	0.06	1	0.06	1
2-Butanone (Methyl Ethyl Ketone)	1	--	500 ^[e]	1000 ^[f]	0.12	50 ^[h]	0.12	NC
1,2-Dichloroethane	1	0.6 ^[c]	30	60	0.02	0.6	0.02	0.6
1,1-Dichloroethene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	0.33	5 ^[d]	0.33	5 ^[d]
cis-1,2-Dichloroethylene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	0.25	5 ^[d]	0.25	5 ^[d]
trans-1,2-Dichloroethylene	1	5	500 ^[e]	1000 ^[f]	0.19	5 ^[d]	0.19	5 ^[d]
Ethylbenzene	1	5	390	780	1.0	5 ^[d]	1.0	5 ^[d]
Isopropylbenzene	1	5 ^[c,d]	NC	NC	2.3 ^[g]	5 ^[d]	2.3 ^[g]	5 ^[d]
Methylene Chloride	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	0.05	5 ^[d]	0.05	5 ^[d]
Tetrachloroethene	1	5 ^[c,d]	150	300	1.3	5 ^[d]	1.3	5 ^[d]
Toluene	1	5	500 ^[e]	1000 ^[f]	0.7	5 ^[d]	0.7	5 ^[d]
1,1,1-Trichloroethane	1	5 ^[c,d]	200	400	0.68	5 ^[d]	0.68	5 ^[d]
Trichloroethene	1	5	190	380	0.47	5 ^[d]	0.47	5 ^[d]
1,2,4-Trimethylbenzene	1	5 ^[c,d]	190	380	3.6	5 ^[d]	3.6	5 ^[d]
1,3,5-Trimethylbenzene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	8.4	5 ^[d]	8.4	5 ^[d]
Vinyl Chloride	1	5	13	27	0.02	2	0.02	2
Xylenes (total)	1	5	500 ^[e]	1000 ^[f]	1.6	5 ^[d]	1.6	5 ^[d]
Naphthalene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	12	10 ^[i]	12	NC
n-butylbenzene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	12	5 ^[d]	12	5 ^[d]
t-butylbenzene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	5.9	5 ^[d]	5.9	5 ^[d]
sec-butylbenzene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	11	5 ^[d]	11	5 ^[d]
n-propylbenzene	1	5 ^[c,d]	500 ^[e]	1000 ^[f]	3.9	5 ^[d]	3.9	5 ^[d]
Semivolatile Organic Compounds (SVOCs) ^[b]								
bis(2-ethylhexyl) phthalate	50	5 ^[c]	NC	NC	435 ^[g]	5	N/A	N/A
Di-n-butylphthalate	50	50 ^[c]	NC	NC	8.1 ^[g]	50	N/A	N/A
Polychlorinated Biphenyls (PCBs)	10	0.1	1	25	3.2	0.09 ^[k]	N/A	N/A

^[a] The RAO for total VOCs in soil is 10 ppm; for each individual VOC it is 1 ppm
^[b] The RAO for total SVOCs in soil is 500 ppm; for each individual SVOC it is 50 ppm
^[c] RAO not directly listed in 1994 ROD; obtained from most recent NYSDEC Ambient Groundwater Quality Standards listed in Table 1 of 6 NYCRR Part 703.5
^[d] Listed as a principal organic contaminant in 6 NYCRR Part 703.5 Table 1 Ambient Water Quality Standards, which has a standard of 5 µg/L if compound not listed elsewhere in Table 1
^[e] The SCOs for commercial use were capped at a maximum value of 500 ppm; refer to Technical Support Document Section 9.3.
^[f] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1,000 ppm; refer to Technical Support Document Section 9.3.
^[g] Supplemental Soil Cleanup Objective listed in Table 1 of CP-51 (NYSDEC 2010a); these are not promulgated standards
^[h] General organic guidance value, human health as listed in TOGS 1.1.1; not a promulgated standard
^[i] Guidance value, aesthetics as listed in TOGS 1.1.1; not a promulgated standard
^[k] Total PCBs

µg/L = microgram(s) per liter
AWQS = Ambient Water Quality Standards, Class GA
COC = constituent of concern
ID = identifier
N/A = not applicable; previous remedial activities achieved 1994 ROD RAOs; therefore these compounds are no longer COCs
NC = no promulgated criteria
NR = Listed in Table 3 of TOGS 1.1.1 as a substance not regulated by the principal organic contaminant groundwater standard
NYCRR = New York Codes, Rules and Regulations
PCB = polychlorinated biphenyl
ppb = part(s) per billion
ppm = part(s) per million
RAO = Remedial Action Objective (term used for media-specific quantitative cleanup goal in 1994 ROD)
ROD = Record of Decision
SCG = standard, criteria, and guidance
SCO = Soil Cleanup Objective
TOGS 1.1.1 = Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998

Table 5-1. Detailed Evaluation of Alternatives
Essex-Hope Site, Jamestown, New York

Criterion	Alternative 1 – Continuation of Existing Extraction and Treatment System	Alternative 2 – Enhancement of Existing Extraction and Treatment System	Alternative 3 – ISTT with NA with Monitoring	Alternative 4 – ISTT and ISCO
	Continued operation of the existing extraction and treatment system	Enhancement of the existing extraction and treatment system by installing additional extraction wells	Remediation of CVOC source zone via ISTT followed by NA with Monitoring	Remediation of CVOC source zone via ISTT and remediation of petroleum-related constituent area via ISCO
Overall Protection of the Public Health and the Environment				
	The goal of the extraction and treatment system is to maintain overall protectiveness of human health and the environment by hydraulic containment and treatment of dissolved-phase groundwater contamination. However, the capture zones created by operation of the current system have not fully contained the CVOC plumes. This is evidenced by the presence of high concentrations of CVOCs offsite that indicate that the extraction and treatment system has not been effective at mitigating migration of CVOC contaminants offsite. Therefore, this alternative does not meet the threshold criteria of overall protectiveness of public health and the environment. Contaminants within OU-01 but outside the capture zones, including the petroleum-related compound plume in the former UST area, would not be contained and would be subject to NA with monitoring. The extraction and treatment system would operate until concentrations decline sufficiently within the capture zone areas so that NA with monitoring can be implemented sitewide, which would be applied until groundwater RAOs are met. The 2014 Declaration of Covenant controls potential onsite exposure pathways as follows: Direct contact with soils is limited by the asphalt and concrete caps, as well as restrictions on disturbances of these engineering controls and a prohibition on disturbance or excavation that results in unacceptable human and animal exposure to contaminated soils. Direct contact with groundwater is precluded by the prohibition on disturbance or excavation of soils at the site, as well as the prohibition on groundwater use for drinking water or industrial purposes without treatment. Ingestion of groundwater is prohibited by the Covenant restrictions on groundwater use for drinking water without treatment. Implementation of Alternative 1 would not affect existing controls in place for overall protection of human health and the environment.	The expanded extraction and treatment system would maintain overall protectiveness of human health and the environment by hydraulic containment and treatment of dissolved-phase groundwater contamination, including the petroleum-related compound plumes at OU-01. The expanded extraction and treatment system would target supplemental mass removal within OU-01 and operate until concentrations decline sufficiently in the capture areas so that NA with monitoring can be implemented throughout OU-01, which would be applied until groundwater RAOs are met. As summarized for Alternative 1, the 2014 Declaration of Covenant controls potential onsite exposure pathways. Implementation of Alternative 2 would not affect the existing controls in place for overall protection of human health and the environment.	ISTT would maintain overall protectiveness of human health and the environment by aggressively removing and treating the CVOC source area. The petroleum-related compound plumes would be subject to NA with monitoring. These plumes have been relatively stable with generally decreasing concentrations and plume sizes. However, the use of NA with monitoring may result in an extended period to attain RAOs in these areas. After ISTT has been implemented, NA with monitoring would be implemented sitewide until groundwater RAOs are met. As summarized for Alternative 1, the 2014 Declaration of Covenant controls potential onsite exposure pathways. Implementation of Alternative 3 would not affect the existing controls in place for overall protection of human health and the environment.	ISTT would maintain overall protectiveness of human health and the environment by aggressively removing and treating the CVOC source area. Additionally, petroleum-related compounds under the West Building and in the former UST area would be aggressively treated by ISCO. After ISTT and ISCO have reduced concentrations sufficiently, NA with monitoring would be implemented throughout OU-01 until groundwater RAOs are met. As summarized for Alternative 1, the 2014 Declaration of Covenant controls potential onsite exposure pathways. Implementation of Alternative 4 would not affect the existing controls in place for overall protection of human health and the environment. Because of the source treatments, the time to achieve RAOs is expected to be shorter than for other alternatives.
Compliance with Standards, Criteria, and Guidance				
	The existing onsite institutional controls and asphalt/concrete cap, and proposed offsite institutional controls, fulfill the remediation goal to eliminate potential for exposure of potential receptors to contaminated soil and groundwater. However, the extraction and treatment system does not fully achieve the remedial goal to mitigate the impacts of contaminated groundwater to the environment because high concentrations of CVOCs have migrated offsite to OU-03. Additionally, attainment of RAOs for soil and groundwater at OU-01, if technically practicable, will require an extended period (at least 50 years).	The existing onsite institutional controls and asphalt/concrete cap, and proposed offsite institutional controls, fulfill the remediation goal to eliminate potential for exposure of potential receptors to contaminated soil and groundwater. The enhanced extraction and treatment system complies with the remediation goal to mitigate the impacts of contaminated groundwater to the environment by improving capture and increasing the amount of contaminated groundwater treated at OU-01. However, attainment of RAOs for groundwater at OU-01, if technically practicable, would still require an extended period (at	The existing onsite institutional controls and asphalt/concrete cap fulfill the remediation goal to eliminate potential for exposure of potential receptors to contaminated soil and groundwater. ISTT complies with the remediation goal to mitigate the impacts of contaminated groundwater to the environment by aggressively reducing contaminant mass in the CVOC source area. NA with monitoring will be applied to the petroleum source areas, which to date have been attenuating, but concentrations above RAOs will likely remain for an extended period. That said, Alternative 3 is expected to attain or	The existing onsite institutional controls and asphalt/concrete cap fulfill the remediation goal to eliminate potential for exposure of potential receptors to contaminated soil and groundwater. The ISTT and ISCO remedies comply with the remediation goal to mitigate the impacts of contaminated groundwater by aggressively reducing contaminant mass in the CVOC and petroleum-related compound source areas. By employing the most aggressive and potentially effective technology (ISTT) in the CVOC source area and a proven aggressive treatment (ISCO) in the petroleum-related compound area, attainment of RAOs for

Criterion	Alternative 1 – Continuation of Existing Extraction and Treatment System	Alternative 2 – Enhancement of Existing Extraction and Treatment System	Alternative 3 – ISTT with NA with Monitoring	Alternative 4 – ISTT and ISCO
	Continued operation of the existing extraction and treatment system	Enhancement of the existing extraction and treatment system by installing additional extraction wells	Remediation of CVOC source zone via ISTT followed by NA with Monitoring	Remediation of CVOC source zone via ISTT and remediation of petroleum-related constituent area via ISCO
	Achievement of the proposed groundwater RAOs may not be technically practicable given the significant contaminant mass present, low permeability materials, and presence of NAPL. The current extraction and treatment system complies with applicable standards, criteria, and guidance for operation, maintenance, treatment, and discharge.	least 50 years) even with additional extraction wells. Achievement of the proposed groundwater RAOs may not be technically practicable given the significant contaminant mass present, low permeability materials, and presence of NAPL. Similar to the current extraction and treatment system, the enhanced extraction and treatment system would comply with applicable standards, criteria, and guidance for operation, maintenance, treatment, and discharge.	approach soil and groundwater RAOs more quickly than Alternatives 1 and 2. Achievement of the proposed groundwater RAOs may not be technically practicable given the significant contaminant mass present and low permeability materials; any NAPL present in the CVOC area is expected to be treated by the ISTT.	groundwater and soil will be achieved or approached more quickly than Alternatives 1, 2, and 3. Achievement of the proposed groundwater RAOs may not be technically practicable given the significant contaminant mass present and low permeability materials; any NAPL present in the CVOC area is expected to be treated by the ISTT.
Long-term Effectiveness and Permanence				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	Groundwater extraction and treatment is a proven technology and effective for hydraulic containment of dissolved-phase groundwater plumes. Although this alternative will increase hydraulic control and mass removal rates at OU-01, this alternative will still require an extended period to reach RAOs because of the substantial mass present. This alternative has low permanence, as hydraulic capture and groundwater treatment can be lost quickly once the system is turned off. Long-term effectiveness is dependent on creating a hydraulic capture zone to prevent or limit downgradient migration of the dissolved phase plume and maximizing contaminant mass removal. NA with monitoring will be applied once contaminant concentrations have declined sufficiently to minimize offsite migration. Although NA can be an effective and permanent approach, monitoring is required to ensure effectiveness. Long-term effectiveness is dependent on demonstrating that contaminant concentrations are attenuating and not migrating to areas where potential receptors could be negatively affected.	Thermal source zone remediation is a proven technology and effective for permanently reducing source zone contaminant volume. Long-term effectiveness is dependent on properly targeting source areas and successfully capturing mobilized contaminants. NA with monitoring is a proven remediation technology for addressing residual impacts that may remain in the CVOC source zone. NA will also be applied in the petroleum-related compound areas; monitoring will be required. Long-term effectiveness is dependent on contaminant concentrations attenuating and not migrating to areas where potential receptors could be negatively affected. Given the concentrations in the petroleum source areas, NA would likely be required for an extended period. Long-term effectiveness of NA is dependent on demonstrating that contaminant concentrations are attenuating and not migrating to areas where potential receptors could be negatively affected.	Thermal source zone remediation and ISCO are proven technologies and effective for permanently reducing source zone contaminant volume. For ISTT, long-term effectiveness is dependent on properly targeting source areas and successfully capturing mobilized contaminants. For ISCO, long-term effectiveness is dependent on injecting oxidants so that they come in direct contact with the contaminants, which can be more difficult to achieve in lower permeability formations. ISCO can also have lower effectiveness if there is significant NAPL present, or if strongly reducing conditions are present that exert high demand for the oxidant. Multiple injections of oxidants are often required to achieve treatment goals. Because some of the petroleum-related compounds are located underneath the West Building, obstructions such as low-clearance ceiling, walls, or equipment may limit the locations where ISCO can be injected, potentially negatively affecting long-term effectiveness. NA with monitoring is a proven remediation technology for addressing residual impacts that may remain following thermal source zone remediation and ISCO. Long-term effectiveness of NA is dependent on demonstrating that contaminant concentrations are attenuating and not migrating to areas where potential receptors could be negatively affected.
Reduction of Toxicity, Mobility, or Volume through Treatment				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	This alternative relies primarily on control and isolation of dissolved-phase groundwater contaminants by maintaining a capture zone to reduce contaminant mobility; there is some reduction of toxicity through the treatment of dissolved-phase contaminants in extracted groundwater. NA with monitoring relies on a variety of attenuation processes, some of which (such as abiotic and biotic degradation) result in reduction of toxicity by degradation of COCs or mobility (such as sorption to soils), and which cumulatively can reduce contaminated groundwater volume. However, these NA processes are generally slow.	ISTT is a technology that significantly reduces the toxicity and volume of contaminants in the target treatment zone by mobilizing contaminants, which are then collected and destroyed via ex situ treatment. This technology is effective at mobilizing and removing contaminants in all phases (dissolved, vapor, NAPL, and sorbed), thereby reducing the toxicity and volume of remaining contaminants. NA with monitoring relies on a variety of attenuation processes, some of which (such as abiotic and biotic degradation) result in reduction of toxicity by degradation of COCs or mobility (such as sorption to soils), and which cumulatively can reduce contaminated groundwater volume. However, these NA processes are generally slow.	ISTT is a technology that significantly reduces the toxicity and volume of contaminants in the target treatment zone by mobilizing contaminants, which are then collected and destroyed via ex situ treatment. This technology is effective at mobilizing and removing contaminants in all phases (dissolved, vapor, NAPL, and sorbed), thereby reducing the toxicity and volume of remaining contaminants. ISCO provides a reduction of toxicity and volume for petroleum hydrocarbon source areas and can result in rapid destruction of contaminants. NA with monitoring relies on a variety of attenuation processes, some of which (such as abiotic and biotic degradation) result in reduction of toxicity by degradation of COCs or mobility (such as sorption to soils), and which cumulatively can reduce contaminated groundwater volume. However, these NA processes are generally slow.

Criterion	Alternative 1 – Continuation of Existing Extraction and Treatment System	Alternative 2 – Enhancement of Existing Extraction and Treatment System	Alternative 3 – ISTT with NA with Monitoring	Alternative 4 – ISTT and ISCO
	Continued operation of the existing extraction and treatment system	Enhancement of the existing extraction and treatment system by installing additional extraction wells	Remediation of CVOC source zone via ISTT followed by NA with Monitoring	Remediation of CVOC source zone via ISTT and remediation of petroleum-related constituent area via ISCO
Short-term Impacts and Effectiveness				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	Alternative 2 is effective in the short term, although installation of additional extraction wells and conveyance piping may result in short-term impacts resulting from the potential exposure of workers to contaminated soils, groundwater, or vapors during installation. These potential impacts could be controlled during construction work by implementing engineering controls such as covering or containing of generated soils, proper personal protective equipment, and monitoring ambient air concentrations in the work zone during active construction using the existing CAMP. Potential impacts would also be associated with continued operation and maintenance of the groundwater treatment plant, including (1) nuisance conditions from increased traffic associated with workers operating the GWTP and trucks handling spent granular activated carbon, and (2) exposure to contaminated groundwater or vapors during treatment or during maintenance of extraction wells. Based on current operation of the GWTP, the adverse impacts of increased traffic are minimal because site operators are only present one to two times a week and carbon changeouts occur one to two times a year, although the frequency may increase with the expanded system. Potential exposures to groundwater or vapors would be mitigated through continued implementation of engineering and administrative controls such as an operation and maintenance plan, proper personal protective equipment, and implementation of a health and safety plan.	Alternative 3 would have short-term impacts associated with mobilization, installation, operation, and demobilization of equipment required for ISTT. Traffic to and from the site would increase during ISTT installation, operation, and decommissioning. Electrodes and recovery wells would be installed in the subsurface, resulting in short-term impacts from potential exposure of workers to contaminated soils, groundwater, or vapor. Additionally, substantial conveyance piping and aboveground treatment equipment would need to be installed and decommissioned. Some of the equipment would be installed inside a building, which could pose additional short-term impacts such as buildup of vapor or carbon monoxide in indoor air during drilling activities. During ISTT activities, vapors could daylight into ambient or indoor air if the vapor control system is inadequate, and there are potential risks to workers associated with the use of high voltage electricity. These impacts can be managed and mitigated through engineering and administrative controls such as those described for Alternative 2, as well as additional procedures such as electrical lock-out tag-out procedures or ventilating indoor spaces to prevent buildup of carbon monoxide.	Alternative 4 would have similar short-term impacts as Alternative 3 for the ISTT portion of the remedy. There would be additional short-term impacts associated with the implementation of ISCO. There may be potential short-term exposure to contaminated soil, groundwater, and vapor during injection well installation or injection of chemicals. During injection, the oxidant could daylight or there could be accidental releases of the oxidant. The potential exists that multiple rounds of injections may be required. Some of the injections may occur inside a building, which may pose additional short-term risks associated with vapor buildup or chemical handling. These impacts can be managed and mitigated through engineering and administrative controls.
Implementability				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	Alternative 2 is likely implementable. Challenges that could potentially be encountered during installation of additional extraction wells and associated piping include the potential for conflicts with subsurface utilities, onsite structures, and site uses by the current owner. The existing groundwater treatment plant may need to be upgraded or expanded to treat and store the additional extracted groundwater, especially because higher groundwater volumes with higher concentrations will likely be extracted than the current system. Approval to install and maintain additional extraction wells and conveyance piping or to expand the groundwater treatment plant may prove challenging given the likely need for access for decades.	Alternative 3 is implementable. Potential challenges may include obtaining and securing the required footprint for in situ thermal treatment equipment, protection of existing utilities and monitoring wells (if not abandoned), connection of the necessary utilities (including transformers and transmission lines sufficient for electrical demand) to operate the equipment and associated permitting, and underground injection permitting if groundwater is recirculated through the subsurface. However, access to the building for the expected duration of ISTT has been negotiated, underground injection permitting can be obtained, and other challenges will be resolved during design.	Alternative 4 is implementable, although the same challenges as noted for Alternative 3 would apply for the ISTT portion. Additional challenges for Alternative 4 are associated with the ISCO remedy component. These challenges include negotiating access to conduct injections in the West Building, and difficulty placing injection wells or DPT injection points, which is dependent upon locations of existing utilities, onsite structures, vehicular traffic patterns, and other potential physical limitations. However, access to the building for the expected duration of ISCO can likely be negotiated, underground injection permitting can be obtained, and other challenges will be resolved during design.
Cost-effectiveness				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	Capital Expense: \$ O&M Cost: \$\$\$ Overall Cost: \$\$\$\$ Effectiveness: Lowest (1) Cost-effectiveness: Low Low capital expense associated with installation of new extraction wells and upgrades to groundwater treatment plant. Highest long-term O&M costs associated with operating and maintaining the expanded groundwater treatment plant and	Capital Expense: \$\$ O&M Cost: \$\$ Overall Cost: \$\$\$\$ Effectiveness: Middle (2) Cost-effectiveness: Middle Although there is moderate capital expense associated with ISTT implementation (operating costs of ISTT are included as a capital expense because of their short duration), this alternative has moderate long-term O&M costs associated with long-term monitoring.	Capital Expense: \$\$\$ O&M Cost: \$ Overall Cost: \$\$\$\$ Effectiveness: Highest (3) Cost-effectiveness: High Highest capital expenses are associated with ISTT implementation (operating costs of ISTT are included as a capital expense because of their short duration) and ISCO injection. Lowest long-term O&M costs are associated with long-term monitoring, which should be shortest for this remedy.

Focused Feasibility Study

Criterion	Alternative 1 – Continuation of Existing Extraction and Treatment System	Alternative 2 – Enhancement of Existing Extraction and Treatment System	Alternative 3 – ISTT with NA with Monitoring	Alternative 4 – ISTT and ISCO
	Continued operation of the existing extraction and treatment system	Enhancement of the existing extraction and treatment system by installing additional extraction wells	Remediation of CVOC source zone via ISTT followed by NA with Monitoring	Remediation of CVOC source zone via ISTT and remediation of petroleum-related constituent area via ISCO
		extraction well network for at least 50 years, as well as long-term monitoring. Because this remedy has similar costs to the other alternatives but has the lowest effectiveness, this alternative has low cost-effectiveness.	Because this remedy has similar costs to the other alternatives and moderate effectiveness, this alternative ranks as having moderate cost-effectiveness.	Because of its highest effectiveness and similar cost to the other alternatives, this alternative ranks as having the highest cost-effectiveness.
Land Use				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	No change; institutional controls restricting land use to industrial will remain in place after remedy implementation.	No change; institutional controls restricting land use to industrial will remain in place after remedy implementation.	No change; institutional controls restricting land use to industrial will remain in place after remedy implementation.
Community Acceptance				
	Alternative 1 does not meet the threshold criteria; therefore, the balancing criteria are not evaluated.	Community acceptance will be determined after the public comment period.		

CAMP = Community Air Monitoring Plan
COC = constituent of concern
CVOC = chlorinated volatile organic compound
DPT = Direct Push Technology
GWTP = Groundwater Treatment Plant
ISCO = in situ chemical oxidation
ISTT = in situ thermal treatment
NA = natural attenuation
NAPL = nonaqueous phase liquid
OU = operable unit
RAO = remedial action objective
UST = underground storage tank

Figures





Approximate OU-01 Site Boundary
as defined in the July 2023
OU-01 Focused Feasibility Study

Parcel

Note:
Offsite area outside of OU-01 boundary is identified
as OU-03. Exact boundary of OU-03 is to be determined.

N

BASE MAP SOURCE:
Bing Aerial Imagery 2022

050100200

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York
FIGURE 2-1a 2023 OU-01 Focused Feasibility Study - Site Overview Map Focused Feasibility Study	
CREATED BY: LA	Jacobs
REVIEWED BY: JK	

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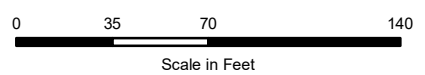


- Approximate OU-01 Focused Feasibility Study Area Boundary
- Parcel

Note:
Offsite area outside of OU-01 boundary is identified as OU-03. Exact boundary of OU-03 is to be determined.



BASE MAP SOURCE:
Bing Aerial Imagery 2022

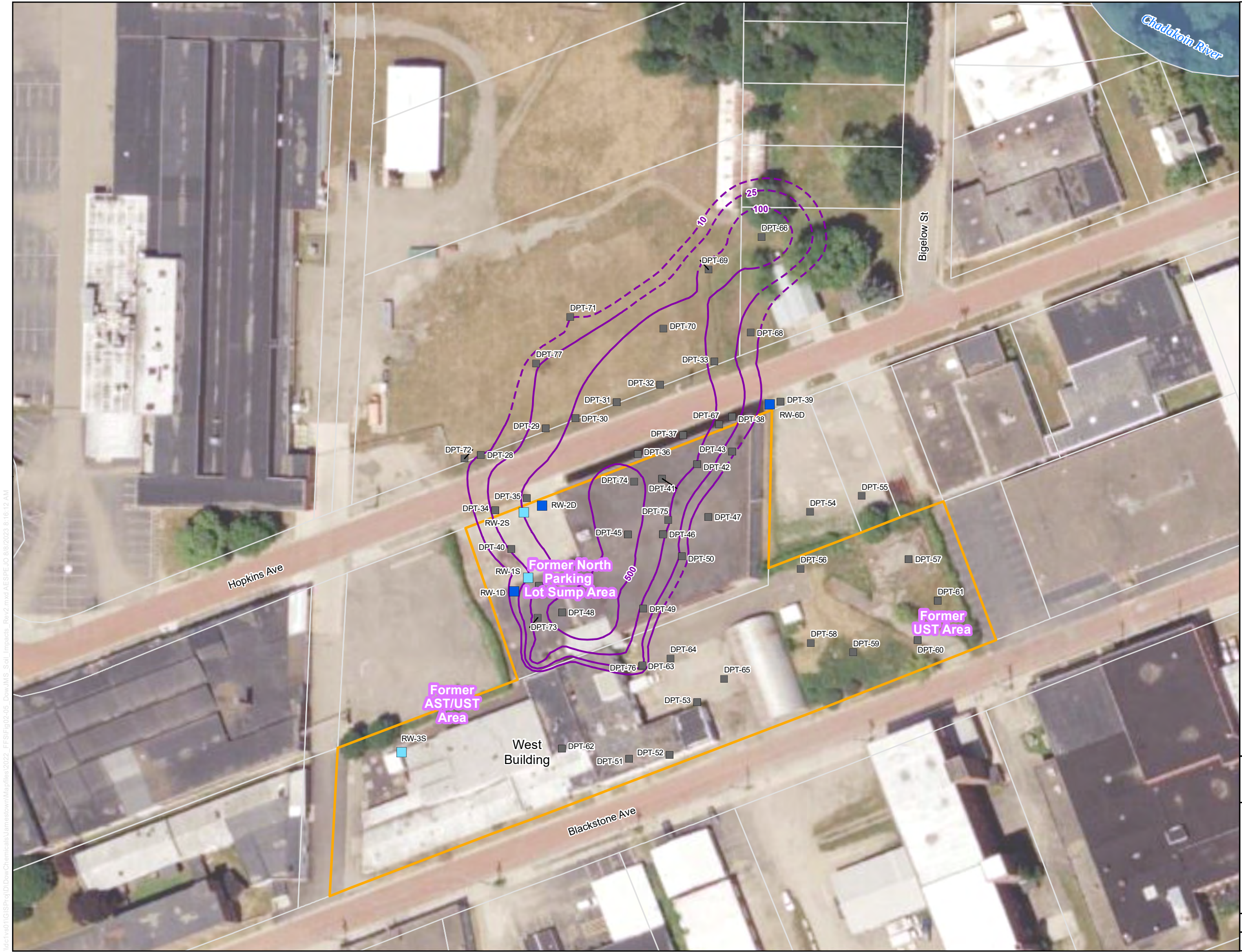


Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 2-2
Site Features Map
Focused Feasibility Study

CREATED BY: LA	Jacobs
REVIEWED BY: JK	

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DPT Boring Location

Deep Recovery Well

Shallow Recovery Well

Soil CVOC Contour (mg/kg)
(Dashed Where Inferred)

Approximate OU-01 Focused
Feasibility Study Area Boundary

Chautauqua County Tax Parcels

Chadakoin River

Notes:

1. total CVOCs = total chlorinated volatile organic compounds (sum of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene, and vinyl chloride detections)

2. Soil results from 2016 (CH2M, 2017), 2017 (CH2M 2018), 2019 (Jacobs, 2020), and 2022 (this investigation) used in developing contours.

N

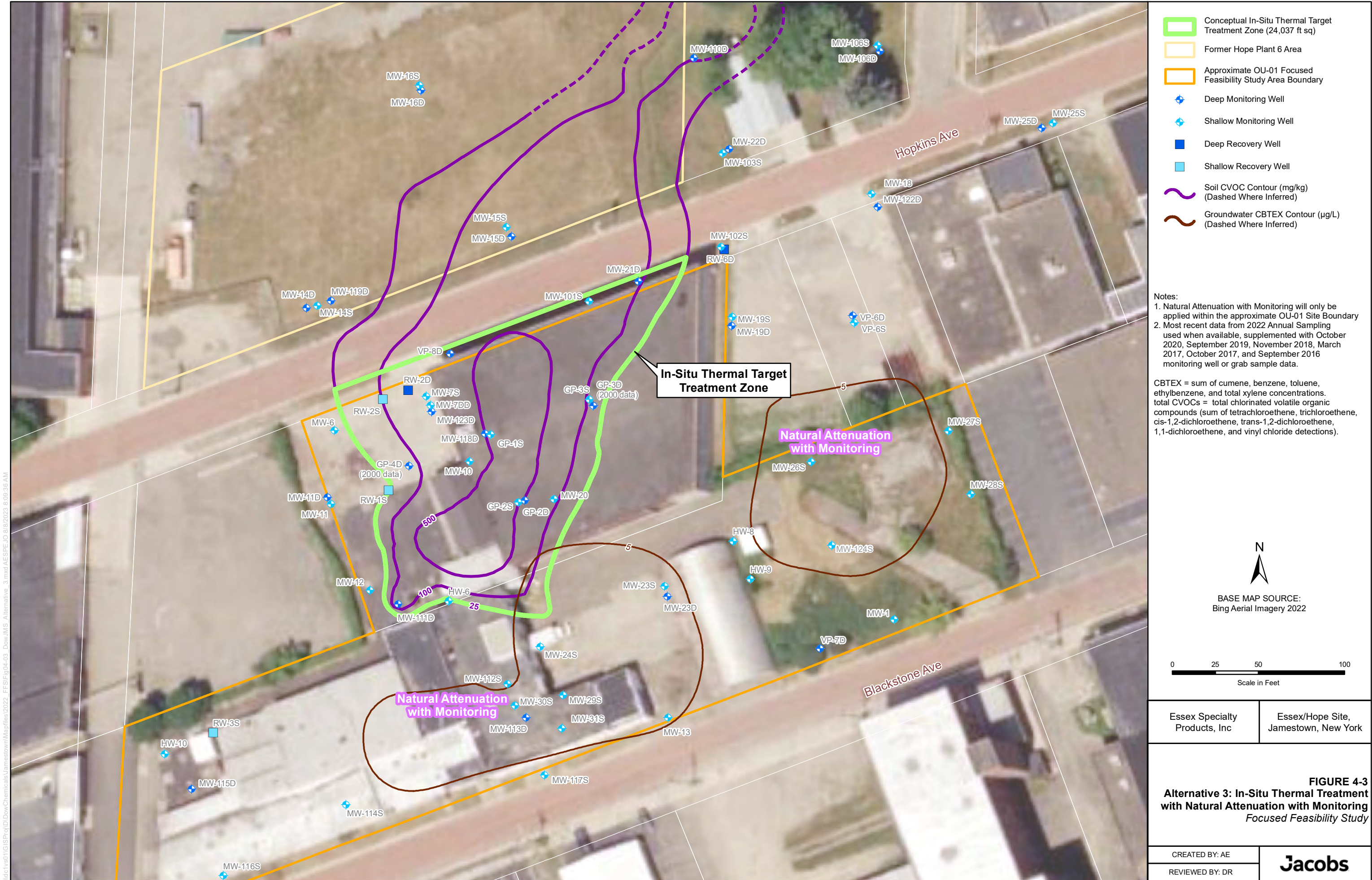
BASE MAP SOURCE:
Bing Aerial Imagery 2022

018.7537.575

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York
FIGURE 2-5 Soil Impacts Focused Feasibility Study	
CREATED BY: AE	Jacobs
REVIEWED BY: AS	

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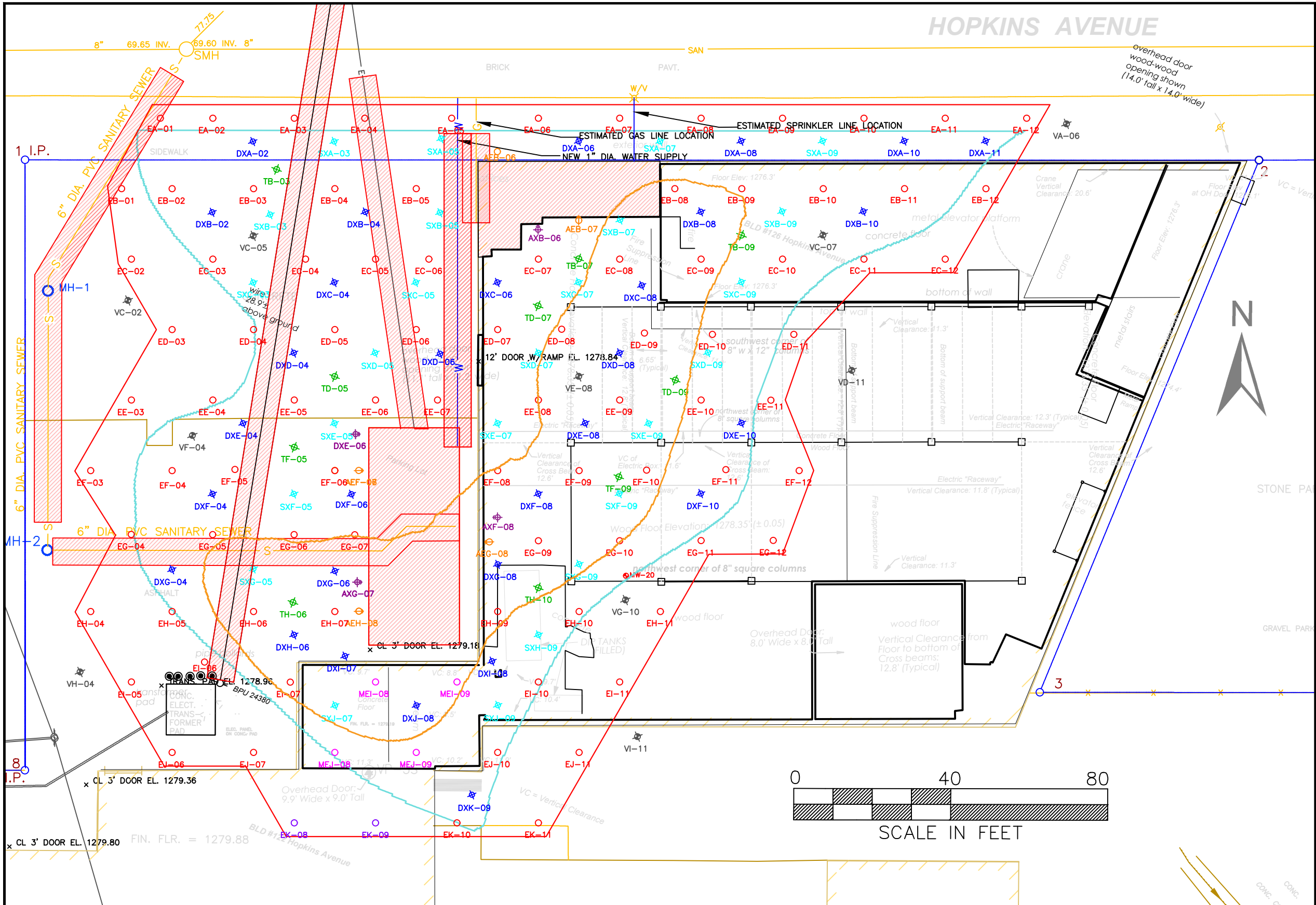


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Appendix B

Vendor Design Drawings





LEGEND

- ET-DSP™ Electrode Location [86]
- ET-DSP™ Angled Electrode Location [5]
- ET-DSP™ 8 ft Electrode Location [4]
- ET-DSP™ Single Electrode Location [2]
- Deep Extraction Well Location [30]
- Angled Extraction Well Location [4]
- Shallow Extraction Well Location [25]
- Sensor Well Location [10]
- Vacuum Monitoring Well [10]
- 25 mg/kg Treatment Area [17,013 ft²]
- 500 mg/kg Treatment Area [5,150 ft²]
- Thermal Influence [23,360 ft²]
- No Drill Zone

NOTES:

1. SURFACE EQUIPMENT TO BE LOCATED.
2. PRELIMINARY DESIGN ONLY – DOES NOT TAKE INTO ACCOUNT SURFACE OBSTACLES.
3. ELECTRODES REQUIRE 25 cm [10"] BORING.
4. DEEP EXTRACTORS REQUIRE 15 cm [8"] BORING.
5. SHALLOW EXTRACTORS REQUIRE A 10 cm [4"] BORING.
6. SENSOR WELLS REQUIRE 3.81 cm [1.5"] DROP TUBE. BORING SIZE IS MIN. 10 cm [4"].



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Jacobs

B8	26/04/2023	90% DESIGN	JM	CC	CC
B7	20/04/2023	ADD SINGLE ELECTRODE LOCATIONS	JM	-	-
B6	03/02/2023	60% DESIGN	JM	CC	CC
B5	04/01/2023	ADJUST BASED ON SURVEY DATA	JM	-	-
B4	19/12/2022	ADD GOOGLE EARTH IMAGE	JM	-	-
B3	24/11/2022	ADD WELL IDS	JM	-	-
REV.	DATE	DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
APEGA PERMIT NUMBER:	P09178		SCALE:	NTS	

TITLE: **ISTR Well Field Layout**

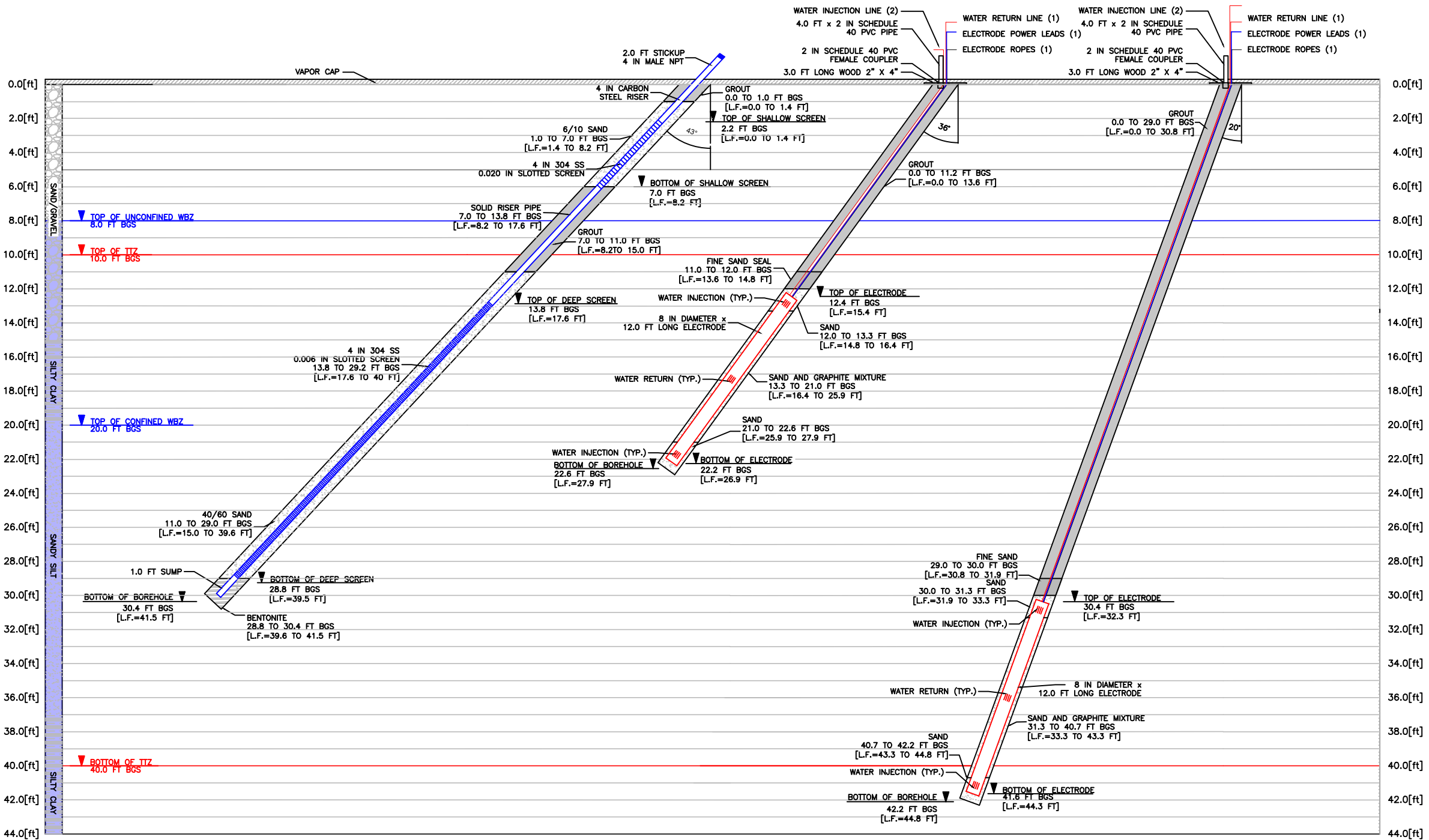
CLIENT: **Jacobs**

PROJECT: **Essex-Hope Site
Jamestown, New York**

SHEET: **WFL-01**

ANGLED DEEP MULTIPHASE EXTRACTION WELL
QTY: 4

DOUBLE ANGLED ELECTRODE WELL
QTY: 5



GENERAL NOTES:

- MATERIAL TYPES
 - GROUT
 - PORTLAND TYPE 1/2 (NO BENTONITE)
 - SAND
 - ELECTRODE WELLS: 10/20 SILICA SAND
 - MULTIPHASE EXTRACTION WELLS: 40/60 SILICA SAND FOR 6 SLOT, 6/10 SAND FOR 20 SLOT
 - SAND AND GRAPHITE MIXTURE
 - 1:7 GRAPHITE TO SAND RATIO
 - 10/20 SILICA SAND
 - FINE SAND
 - ELECTRODE WELLS: 40/60 SILICA SAND
 - MULTIPHASE EXTRACTION WELLS: 40/60 SILICA SAND
 - BENTONITE
 - MEDIUM CHIPS
- ANGLED DOUBLE ELECTRODE WELLS
 - MINIMUM 10" DIAMETER BOREHOLE
 - WATER RETURN LINE INCLUDED TO ALLEVIATE LOCALIZED PRESSURE BUILD UP WITHIN THE ELECTRODE WELL
 - ELECTRODES TO BE LOWERED INTO BOREHOLES WITH TECH LINE ROPE AND SECURED TO A 3 FT LONG PIECE OF 2x4" LUMBER AT GROUND SURFACE, TO PREVENT POSSIBLE SINKING DUE TO SETTLEMENT
 - NO BENTONITE TO BE USED FOR ELECTRODE WELLS
- ANGLED DEEP MULTIPHASE EXTRACTION WELLS
 - MINIMUM 8" DIAMETER BOREHOLE TO ACCOMMODATE 4" NOMINAL DIAMETER RISER PIPE
 - WELL SCREEN IS EITHER 4" 304 STAINLESS STEEL WITH CONTINUOUS KEYSTONE WIRE WRAP WITH 0.006" SLOT SIZE OR 0.020" SLOT SIZE DEPENDING ON DEPTH
 - RISER PIPE IS 4" SCHEDULE 40 OR EQUIVALENT CARBON STEEL PIPE WITH NPT THREADED CONNECTIONS
 - STICKUPS MUST BE 4" MALE NPT
 - EXTRACTION RISER PIPE TO BE WRENCH TIGHTENED. THREADS TO BE SEALED WITH PTFE TAPE



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PH: 403.569.5100, FX: 403.272.7201

Jacobs

REV	DATE	DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
B3	26/04/2023	90% DESIGN	JM	CC	CC
B2	02/02/2023	60% DESIGN	JM	JM	CC
B1	12/09/2022	DRAFT FOR 30% DESIGN	JM	JM	DAR
DATE		DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
DATE		DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
APEGA PERMIT NUMBER:		P09178	SCALE:	NTS	

TITLE:

ISTR Well Construction Diagram

Jacobs

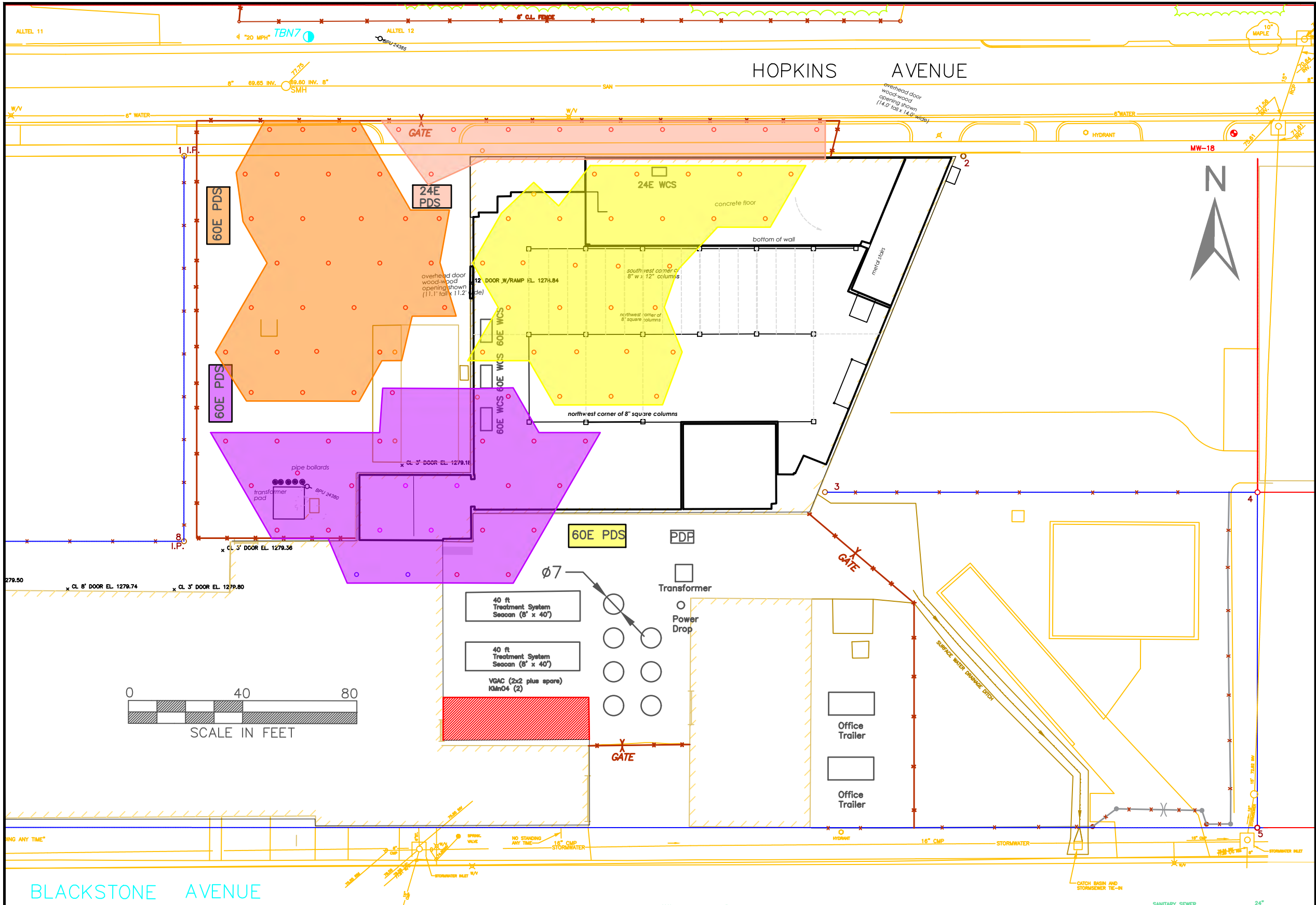
CLIENT:

PROJECT:

Essex-Hope Site
Jamestown, New York

SHEET:

WCD-02



LEGEND

- ET-DSP™ Electrode Location [86]
- ET-DSP™ Angled Electrode Location [5]
- ET-DSP™ Mini Electrode Location [4]
- ET-DSP™ Single Electrode Location [2]
- Pre Existing Fence
- New Fence Location [~550 ft]
- Proposed Equipment Locations
- PDS 1 Electrode Group [22]
- PDS 2 Electrode Group [58]
- PDS 3 Electrode Group [58]
- PDS 4 Electrode Group [58]
- No Access Area

NOTES:

1. PDS Groupings are for information purposes only and are subject to change, without notice, by the Mc2 engineers.



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PH: 403.569.5100, FX: 403.272.7201

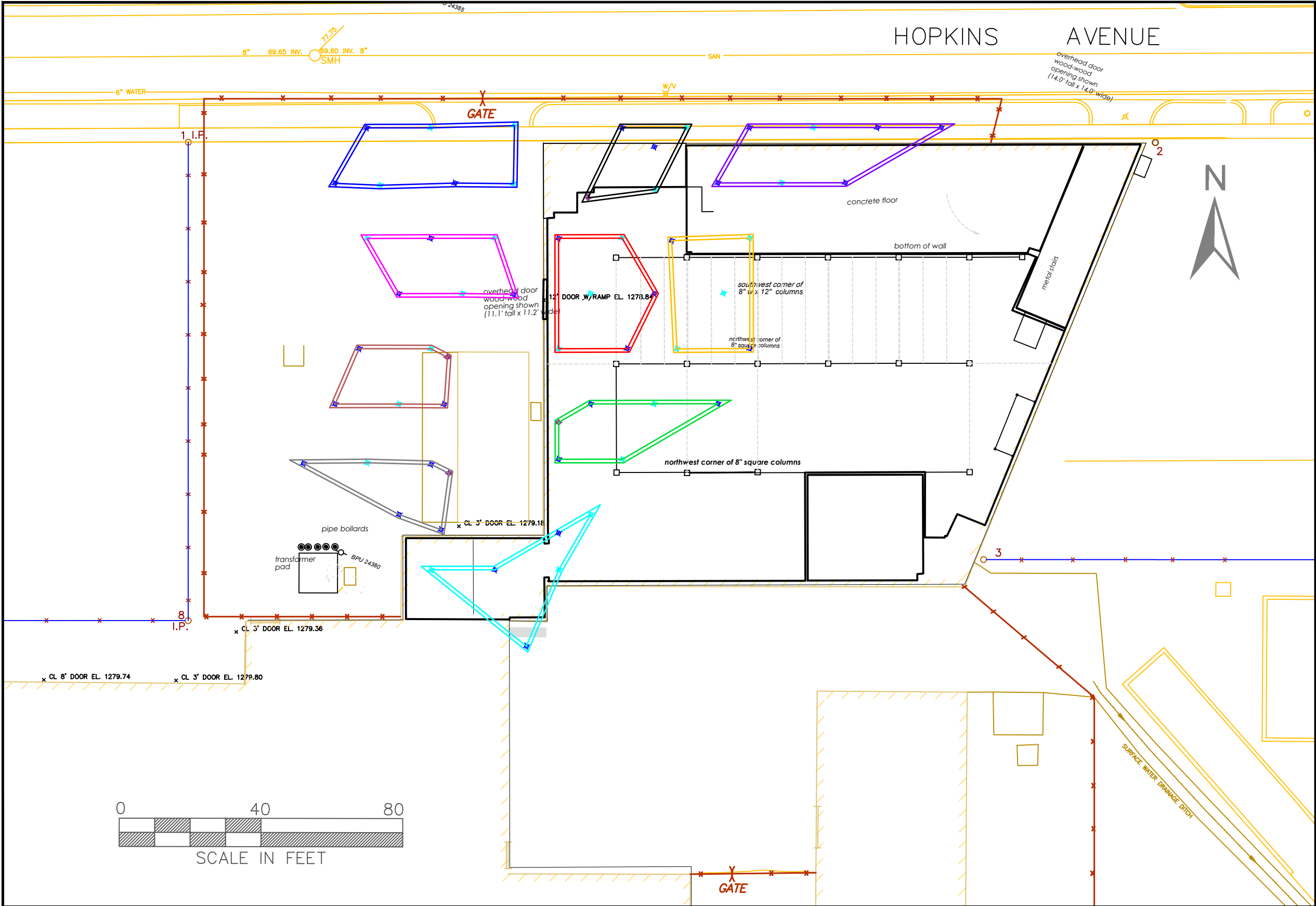
Jacobs

REV.	DATE	DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
B3	28/04/2023	POWER DROP PLACEMENT	EB	CC	CC
B2	26/04/2023	90% DESIGN	JM	CC	CC
B1	08/02/2023	SITE SECURITY LAYOUT	JM	CC	CC
REV.	DATE	DESCRIPTION	DRAWN BY	REV'D BY	APP'D BY
APEGA PERMIT NUMBER:	P09178		SCALE:	NTS	

TITLE: **Equipment Layout**
CLIENT: **Jacobs**

PROJECT: **Essex-Hope Site
Jamestown, New York**

SHEET: **EQL-01**

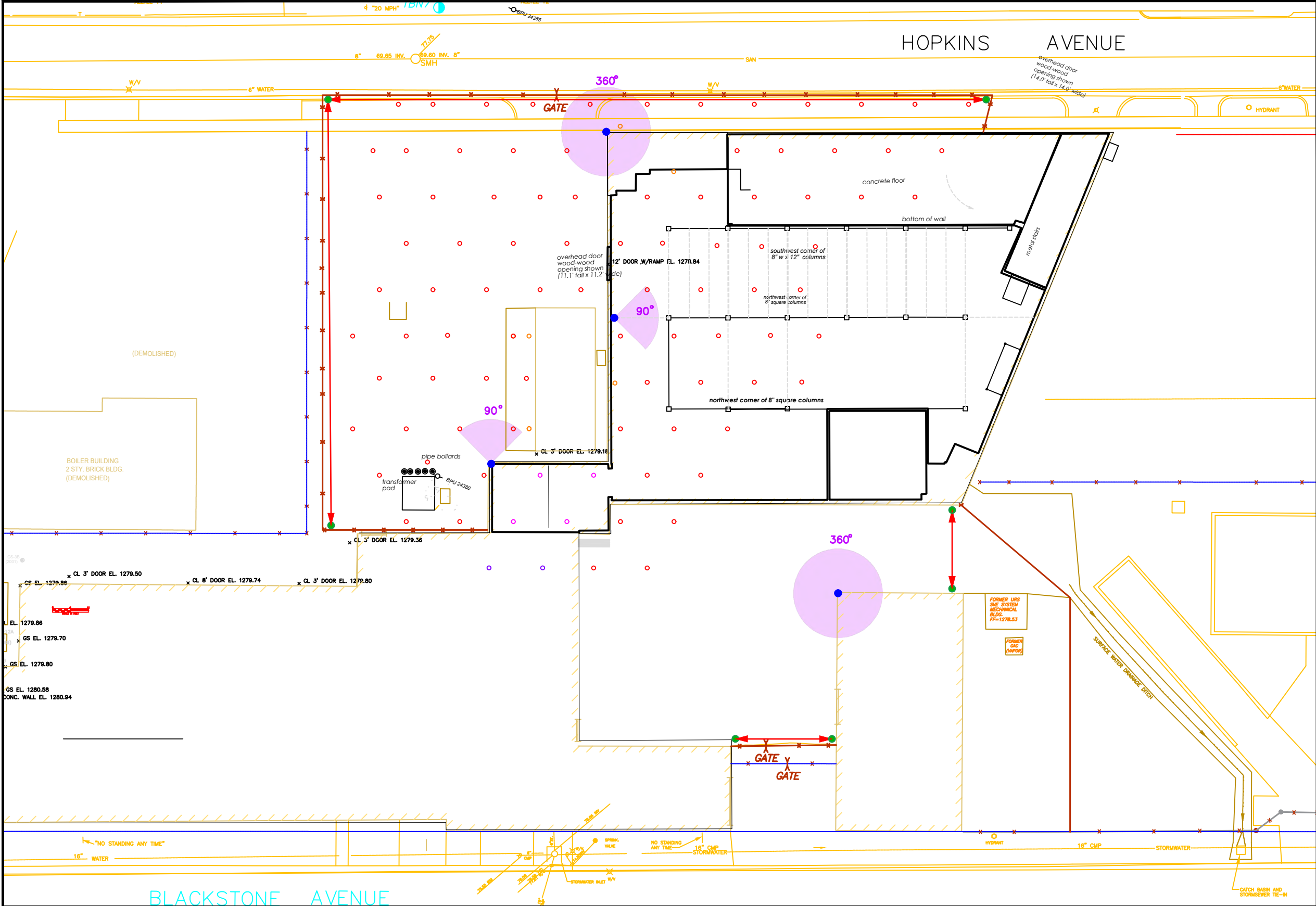


LEGEND

- Deep Extraction Well Location [30]
- Angled Extraction Well Location [4]
- Shallow Extraction Well Location [25]
- Solenoid Group 1 [7]
- Solenoid Group 2 [4]
- Solenoid Group 3 [7]
- Solenoid Group 4 [6]
- Solenoid Group 5 [6]
- Solenoid Group 6 [5]
- Solenoid Group 7 [6]
- Solenoid Group 8 [6]
- Solenoid Group 9 [6]
- Solenoid Group 10 [6]

NOTES:

1. Solenoid Groupings are for information purposes only and are subject to change, without notice, by the Mc2 engineers.

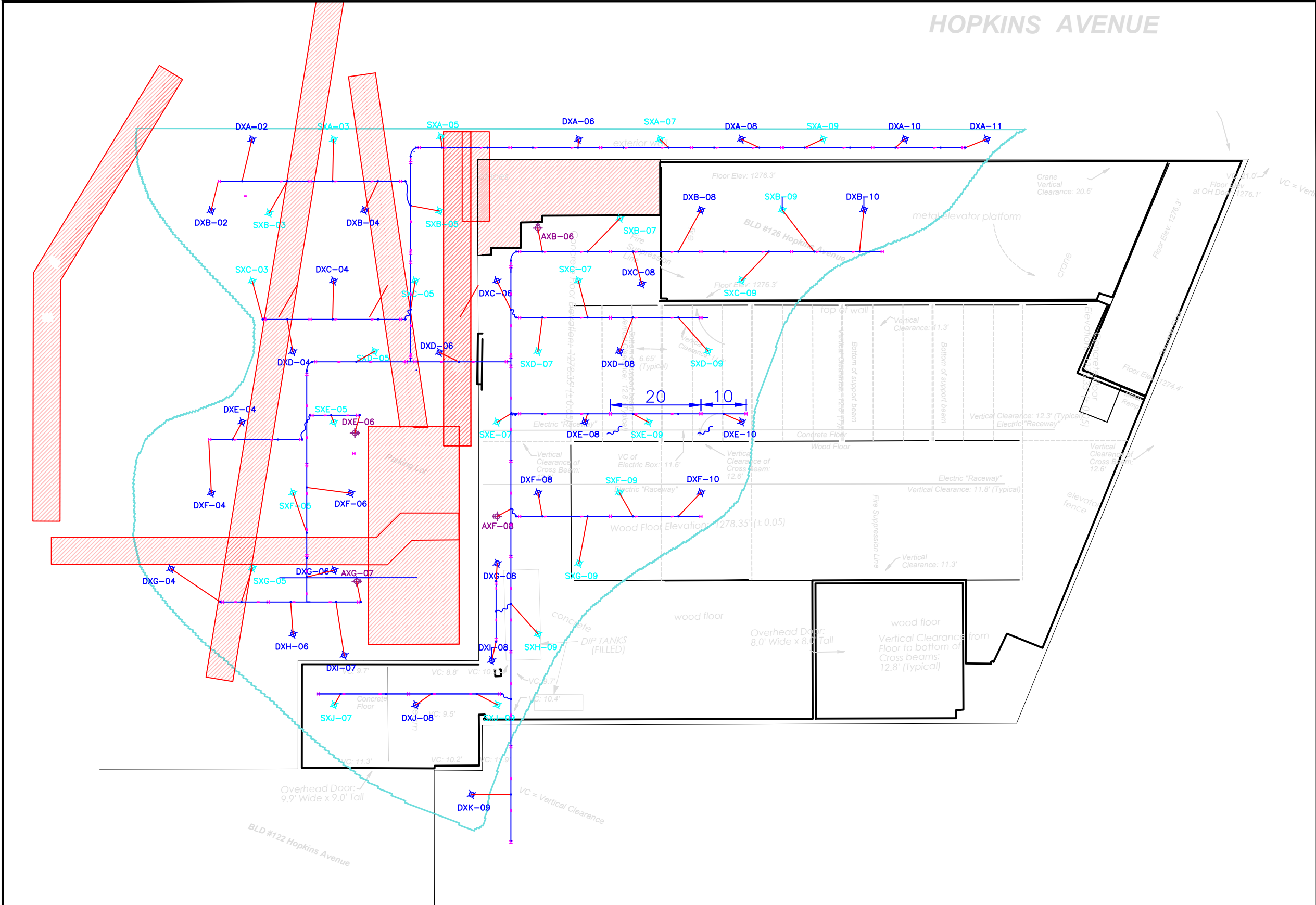


LEGEND

- ET-DSP™ Mini Electrode Location [4]
- ET-DSP™ Electrode Location [86]
- Pre-existing Fence
- New Fence Location [~550 ft]
- Fence Gate Locations [2]
- Camera Locations [4]
- Proposed Locations for Equipment
- Perimeter Beam Path
- Perimeter Beam Posts [7]
- Camera Field of View

NOTES:

1. SURFACE EQUIPMENT TO BE LOCATED.
2. PRELIMINARY DESIGN ONLY – DOES NOT TAKE INTO ACCOUNT SURFACE OBSTACLES.
3. SUBJECT TO CHANGE BASED ON FIELD INSTALLATION. NUMBER OF CAMERAS AND LOCATIONS ARE ESTIMATES AND TO BE FINALIZED DURING INSTALLATION.
4. CAMERA FIELDS OF VIEW FOR REFERENCE ONLY
5. CAMERA FIELDS OF VIEW EXTEND BEYOND SHADED REGION AT SAME ANGLE



LEGEND

- Deep Extraction Well Location [30]
- Angled Extraction Well Location [4]
- Shallow Extraction Well Location [25]
- Extraction Piping
- PEX
- 25 mg/kg Treatment Area (17,013 ft²)
- No Drill Zone

NOTES:

1. SURFACE EQUIPMENT TO BE LOCATED.
2. PRELIMINARY DESIGN ONLY – DOES NOT TAKE INTO ACCOUNT SURFACE OBSTACLES.
3. ELECTRODES REQUIRE 25 cm [10"] BORING.
4. DEEP EXTRACTORS REQUIRE 15 cm [8"] BORING.
5. SHALLOW EXTRACTORS REQUIRE A 10 cm [4"] BORING.
6. SENSOR WELLS REQUIRE 3.81 cm [1.5"] DROP TUBE. BORING SIZE IS MIN. 10 cm [4"].



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B2	18/05/2023	90% DESIGN PIPE LAYOUT	WR	CC	CC
B1	26/04/2023	90% DESIGN	JM	CC	CC
REV.	DATE	DESCRIPTION	DRAWN	REV'D	APP'D
	(DDMM/YYYY)		BY	BY	BY
APEGA PERMIT NUMBER: P09178			SCALE:	NTS	

TITLE:

ISTR Preliminary Piping Layout

Jacobs

CLIENT:

PROJECT:

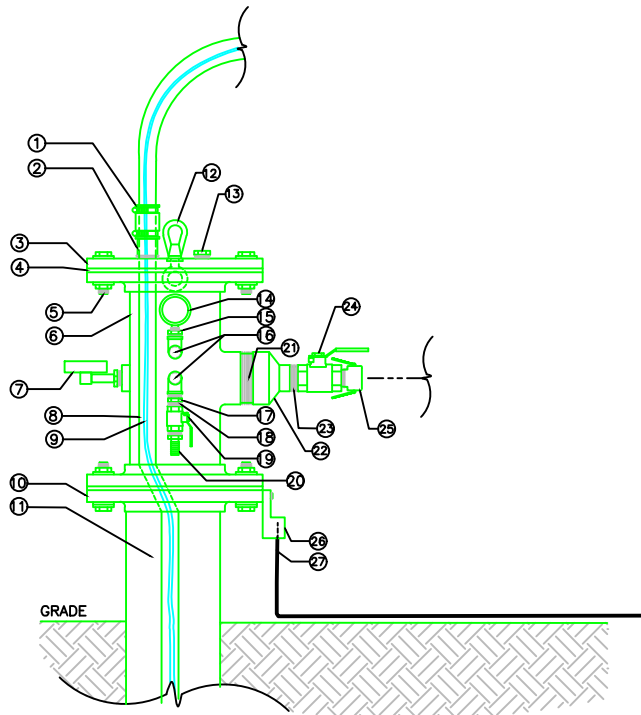
Essex-Hope Site
Jamestown, New York

SHEET:

SHEET:

PLQ-01

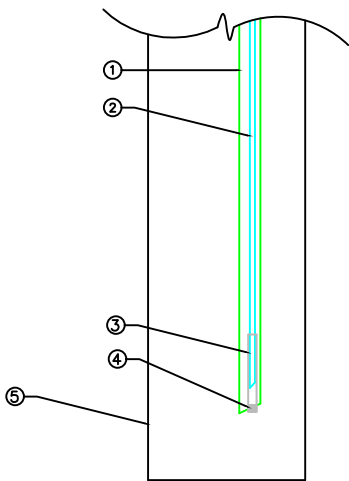
DEEP MULTIPHASE EXTRACTION
WELL WITH SLURPER TUBE
DETAIL



WELLHEAD COMPONENTS

- 5/4" M ELASTIC COMPRESSION FITTING
- 5/4" NPT HALF-NPPLE, 3" LONG, GALV.
- 4" Ø 150# WELL COVER PLATE, STEEL
- 4" Ø 150# X 1/8" GASKET, VITON (TYP.)
- 5/8" BOLT, C/W LOCK WASHER AND HEX NUT, ZINC (TYP.)
- 4" Ø Mc² WELLHEAD ASSEMBLY X 150# FLANGE ENDS, STEEL
- TEMPERATURE GAUGE 0-250 F X 1/2" M NPT
- 1" I.D. PEX GROUNDWATER EXTRACTION HOSE
- 3/4" I.D. TEFLON COMPRESSED AIR LINE (INTERNAL)
- 4" Ø 150# FLANGE X 4" F NPT, STEEL
- 4" Ø M NPT WELL STICKUP, CARBON STEEL
- 1/2" NPT PLUG, GALV.
- 3/4" NPT SAMPLE PORT PLUG, GALV. (TYP.)
- VACUUM GAUGE, 0-30" HG X 1/4" M NPT
- 1/2" M NPT X 1/4" F NPT BUSHING, GALV.
- 1/2" NPT STREET ELBOW, GALV.
- 1/2" M NPT X 3/8" F NPT REDUCER BUSHING, GALV.
- 3/8" NPT CLOSE NIPPLE, BRASS
- 3/8" NPT BALL VALVE, BRASS
- 3/8" M NPT X 1/4" HOSE BARB, BRASS
- 2" NPT CLOSE NIPPLE, GALV.
- 2" F NPT X 1" F NPT BELL REDUCER, GALV.
- 1" NPT CLOSE NIPPLE, GALV.
- 1" NPT BALL VALVE, BRASS
- 1" M NPT X 1" FEMALE CAMLOCK (PART B), ALLOY
- #1/0 GROUNDING LUG, ALUM.
- #1/0 ET-DSP NEUTRAL WIRE

SLURPER TUBE DETAIL

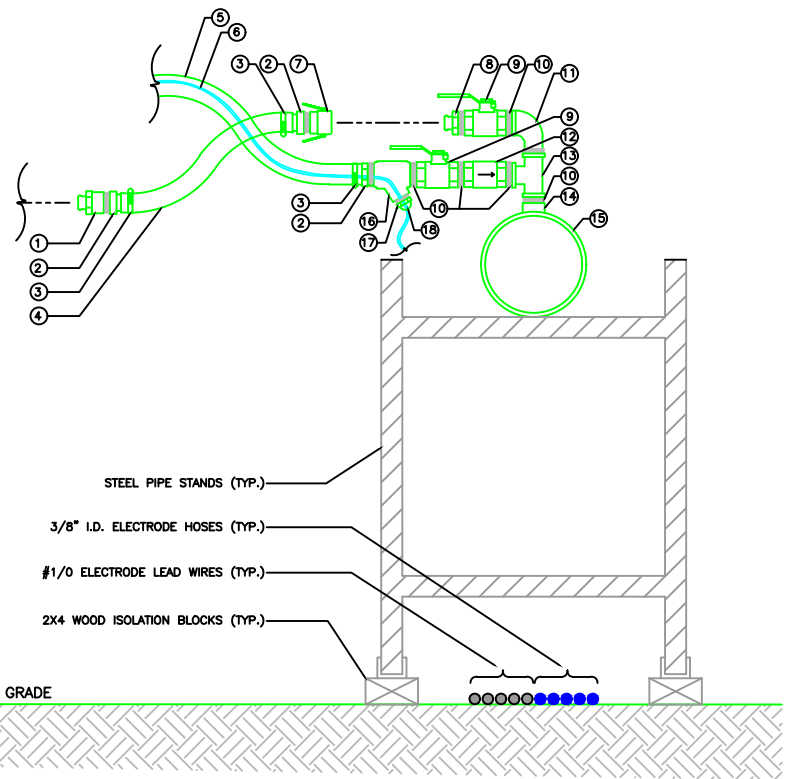


SLURPER TUBE DETAIL COMPONENTS

- 1" I.D. PEX TUBE CUT ON 45 DEGREE ANGLE
- 1/4" I.D. COMPRESSED AIR LINE CUT ON 45 DEGREE ANGLE
- 1/2" HDPE INNER TUBE AIRLINE HOUSING
- 1/2" NPT PLUG, GALV.
- 4" Ø I.D. SCHED. 40 0.006" SLOTTED CONTINUOUS WIRE WRAP SCREEN

NOTE: Slurper tube details are elevation views.

DEEP MULTIPHASE EXTRACTION WELL
CONNECTION TO CONVEYANCE PIPING
NETWORK

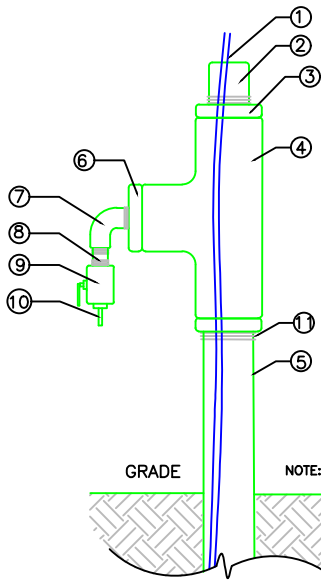


PIPING CONNECTION COMPONENTS

- 1" MALE CAMLOCK TO 1" F NPT (PART A), ALUM. ALLOY
- 1" M NPT TO X 1" PEX BARB
- 1-1/4" T BOLT CLAMP
- 1" ID PEX VAPOR EXTRACTION HOSE
- 1" ID PEX GROUNDWATER EXTRACTION HOSE
- 1/4" ID PTFE COMPRESSED AIR LINE (INTERNAL)
- 1" F NPT X 1" FEMALE CAMLOCK (PART D), ALUM. ALLOY
- 1" MALE CAMLOCK X 1" M NPT (PART F), ALUM. ALLOY
- 1" NPT BALL VALVE, BRASS
- 1" NPT CLOSE NIPPLE, GALV.
- 1" NPT STREET ELBOW, GALV.
- 1" SPRING CHECK VALVE, BRASS.
- 1" F NPT X 1" F NPT X 1" F NPT TEE, GALV.
- 1" F NPT WELDOLET, CARBON STEEL
- 1-1/2" - 10" Ø CONVEYANCE PIPE HEADER, CARBON STEEL
- 1" NPT STRAIGHT WYE, GALV.
- 1" M NPT X 3/4" F NPT REDUCER BUSHING, GALV.
- 3/4" M NPT X 1/4" CORD GRIP

NOTE: 1/4" TEFLON air assist is pushed through the cord grip from the outside and connected to the compressed air supply. Air assist lines at each extraction well location have a 1/4" ball valve with push-to-connect fittings for isolation. Main conveyance pipe is interconnected with dresser couplings and sloped at approximately 0.1 degree from horizontal towards the treatment system. Details are elevation views.

DigiTAM™ WELLHEAD DETAIL



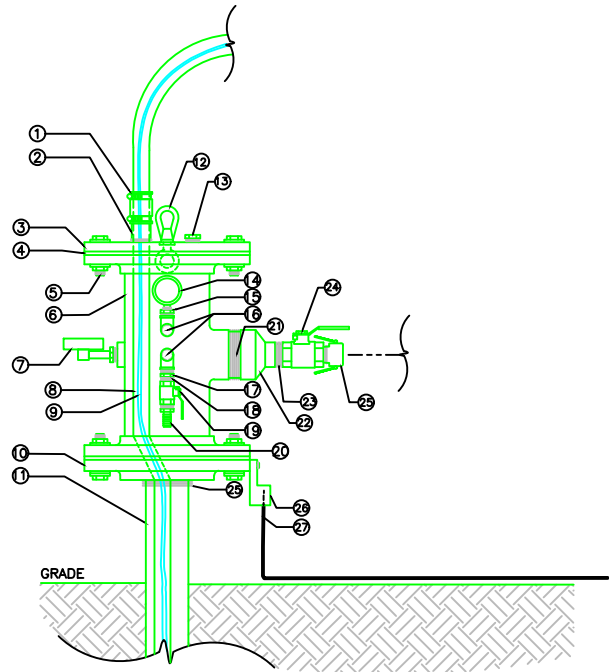
DigiTAM™ WELLHEAD COMPONENTS

- DigiTAM™ SENSOR STRING
- 1" STRAIN RELIEF (ASSEMBLED ON DigiTAM™)
- 2" M NPT TO 1" F NPT REDUCER BRUSHING
- 2" F NPT X 2" F NPT X 2" F NPT TEE, GALV.
- 1.5" CARBON STEEL CASING
- 2" M NPT X 3/8" F NPT BRUSHING, GALV.
- 3/8" NPT STREET ELBOW, GALV.
- 3/8" NPT CLOSE NIPPLE, GALV.
- 3/8" NPT BALL VALVE, BRASS
- 3/8" M NPT X 1/4" HOSE BARB, BRASS
- 2" M NPT X 1.5" F NPT BUSHING, GALV.

NOTE: DigiTAM™ wellhead details are elevation views.

NOTE: Wellhead painted with Dolph-Spray(R) ER-41 and electrically isolated from piping with the PVDF nipple. Wellhead details are elevation views.

SHALLOW MULTIPHASE
EXTRACTION WELL WITH SLURPER
TUBE DETAIL

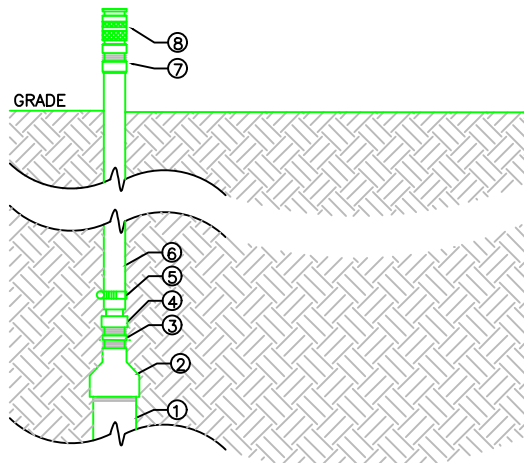


WELLHEAD COMPONENTS

- 5/4" M ELASTIC COMPRESSION FITTING
- 5/4" NPT HALF-NIPPLE, 3" LONG, GALV.
- 4" Ø 150# WELL COVER PLATE, STEEL
- 4" Ø 150# X 1/8" GASKET, VITON (TYP.)
- 5/8" BOLT, C/W LOCK WASHER AND HEX NUT, ZINC (TYP.)
- 4" Ø Mc² WELLHEAD ASSEMBLY X 150# FLANGE ENDS, STEEL
- TEMPERATURE GAUGE 0-250 F X 1/2" M NPT
- 1" I.D. PEX GROUNDWATER EXTRACTION HOSE
- 1/4" I.D. TEFLON COMPRESSED AIR LINE (INTERNAL)
- 4" Ø 150# FLANGE X 4" F NPT, STEEL
- 2" Ø M NPT WELL STICKUP, CARBON STEEL
- 1/2" NPT PLUG, GALV
- 3/4" NPT SAMPLE PORT PLUG, GALV. (TYP.)
- VACUUM GAUGE, 0-30" HG X 1/4" M NPT
- 1/2" M NPT X 1/4" F NPT BUSHING, GALV.
- 1/2" NPT STREET ELBOW, GALV.
- 1/2" M NPT X 3/8" F NPT REDUCER BUSHING, GALV.
- 3/8" NPT CLOSE NIPPLE, BRASS
- 3/8" NPT BALL VALVE, BRASS
- 3/8" M NPT X 1/4" HOSE BARB, BRASS
- 2" NPT CLOSE NIPPLE, GALV.
- 2" F NPT X 1" F NPT BELL REDUCER, GALV.
- 1" NPT CLOSE NIPPLE, GALV.
- 1" NPT BALL VALVE, BRASS
- 2" F NPT X 4" M NPT THREADED REDUCER BUSHING
- #1/0 GROUNDING LUG, ALUM.
- #1/0 ET-DSP NEUTRAL WIRE

NOTE: Wellhead painted with Dolph-Spray(R)
ER-41 and electrically isolated from piping
with the PVDF nipple. Wellhead details are
elevation views.

VACUUM MONITORING WELLHEAD DETAIL

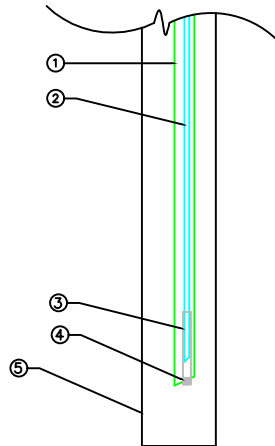


VACUUM MONITORING WELLHEAD DETAIL
COMPONENTS

- 1-1/4" M NPT WELL POINT, 60" LONG, SS
- 1-1/4" F NPT X 1/2" F NPT REDUCER BELL, GALV.
- 1/2" M NPT X 1/4" F NPT REDUCER BUSHING, GALV.
- 1/4" M NPT X 1/8" HOSE BARB, GALV.
- 1/4" OD OETICKER CLAMP
- 1/4" OD (1/8" ID) CLEAR TEFLON HOSE
- 1/4" PUSH TO CONNECT X 1/4" M NPT ADAPTER
- 1/4" F NPT X 1/4" QUICK CONNECT. BRASS

NOTE: Wellhead details are elevation views.

SLURPER TUBE DETAIL

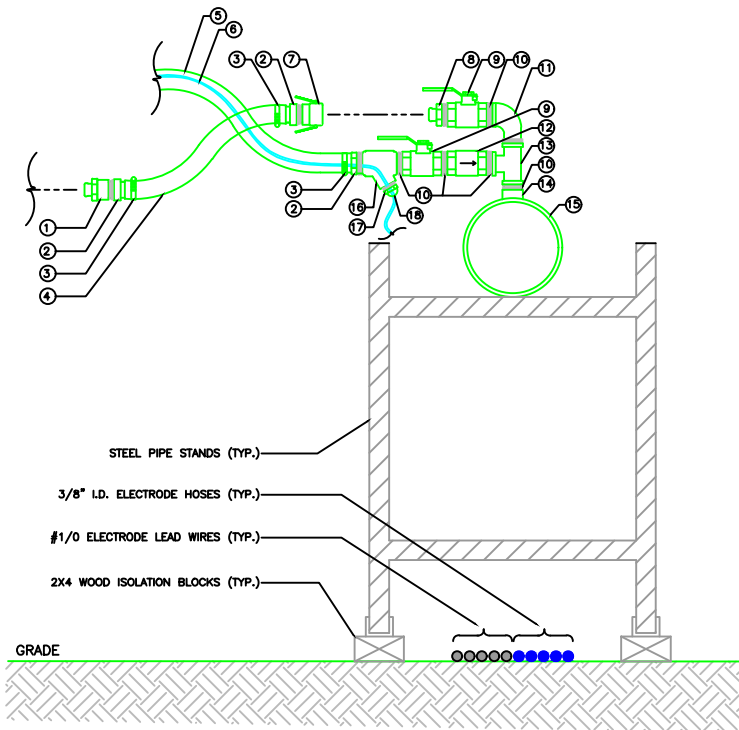


SLURPER TUBE DETAIL COMPONENTS

- 1" I.D. PEX TUBE CUT ON 45 DEGREE ANGLE
- 1/4" I.D. COMPRESSED AIR LINE CUT ON 45 DEGREE ANGLE
- 1/2" HDPE INNER TUBE AIRLINE HOUSING
- 1/2" NPT PLUG, GALV.
- 2" Ø I.D. SCHED. 40 0.006" SLOTTED CONTINUOUS WIRE WRAP SCREEN

NOTE: Slurper tube details are elevation views.

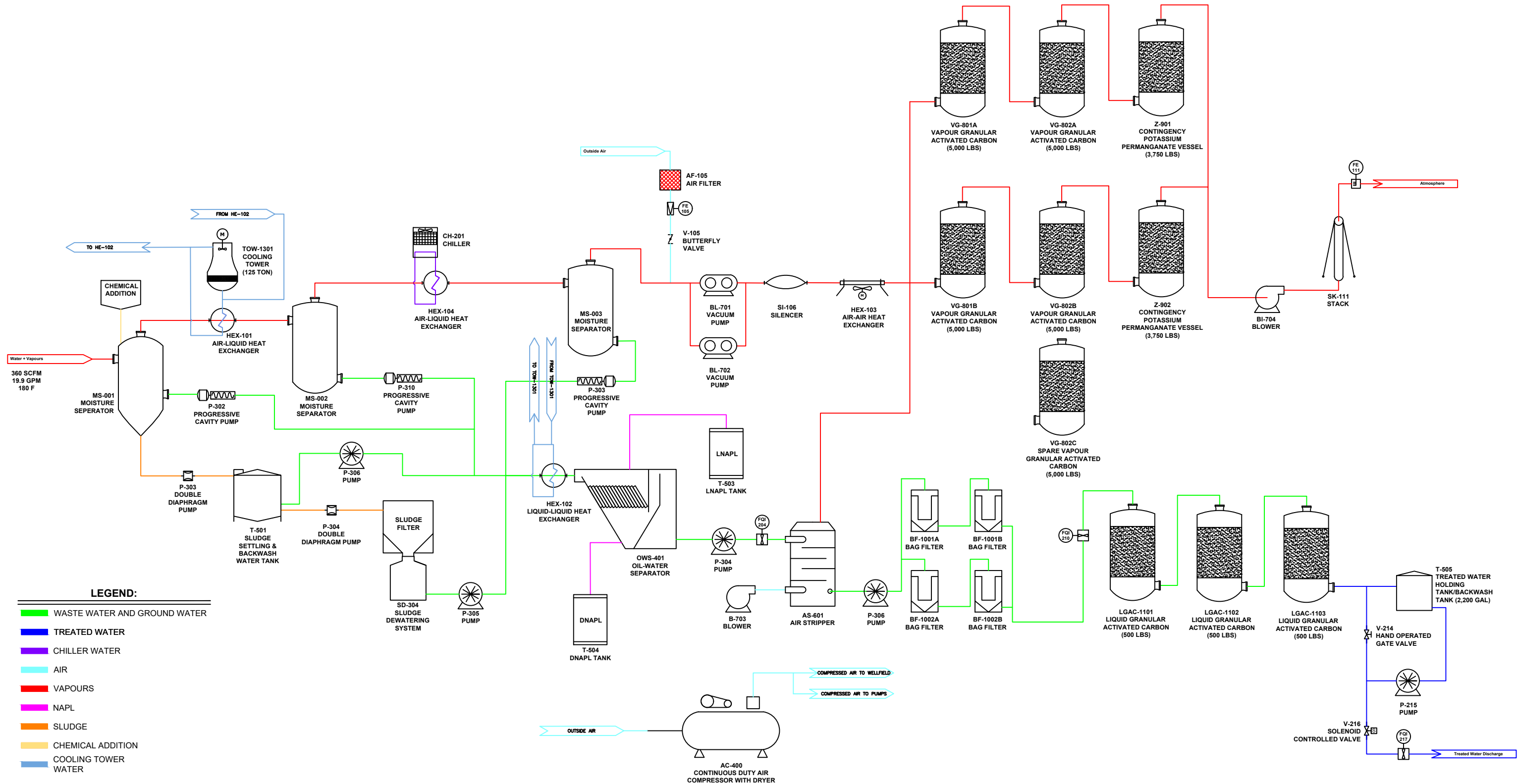
SHALLOW MULTIPHASE EXTRACTION WELL
CONNECTION TO CONVEYANCE PIPING
NETWORK



PIPING CONNECTION COMPONENTS

- 1" MALE CAMLOCK TO 1" F NPT (PART A), ALUM. ALLOY
- 1" M NPT TO X 1" PEX BARB
- 1-1/4" T BOLT CLAMP
- 1" ID PEX VAPOR EXTRACTION HOSE
- 1" ID PEX GROUNDWATER EXTRACTION HOSE
- 1/4" ID PTFE COMPRESSED AIR LINE (INTERNAL)
- 1" F NPT X 1" FEMALE CAMLOCK (PART D), ALUM. ALLOY
- 1" MALE CAMLOCK X 1" M NPT (PART F), ALUM. ALLOY
- 1" NPT BALL VALVE, BRASS
- 1" NPT CLOSE NIPPLE, GALV.
- 1" NPT STREET ELBOW, GALV.
- 1" SPRING CHECK VALVE, BRASS.
- 1" F NPT X 1" F NPT X 1" F NPT TEE, GALV.
- 1" F NPT WELDOLET, CARBON STEEL
- 1-1/2" - 10" Ø CONVEYANCE PIPE HEADER, CARBON STEEL
- 1" NPT STRAIGHT WYE, GALV.
- 1" M NPT X 3/4" F NPT REDUCER BUSHING, GALV.
- 3/4" M NPT X 1/4" CORD GRIP

NOTE: 1/4" TEFLON air assist is pushed through the cord grip from the outside and connected to the compressed air supply. Air assist lines at each extraction well location have a 1/4" ball valve with push-to-connect fittings for isolation. Main conveyance pipe is interconnected with dresser couplings and sloped at approximately 0.1 degree from horizontal towards the treatment system. Details are elevation views.



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PH: 403.569.5100, FX: 403.272.7201



REV.	DATE	DESCRIPTION	DFT	ENG.	APPRV.
B2	28/02/2022	MATCH TO P&ID NOMENCLATURE	JM	DAR	-
B1	06/02/2022	UPDATE DURING REVIEW PERIOD	JM	DAR	DAR
A1	08/29/2022	PROPOSAL STAGE	DAR	DAR	DAR
REV.	DATE	DESCRIPTION	DFT	ENG.	APPRV.
00/00/0000					
APEGA PERMIT NUMBER: P09178					

TITLE: **Soil Vapor and Groundwater Process Flow Diagram Proposal**
CLIENT: **Jacobs**

PROJECT: **Essex Hope Superfund Site**

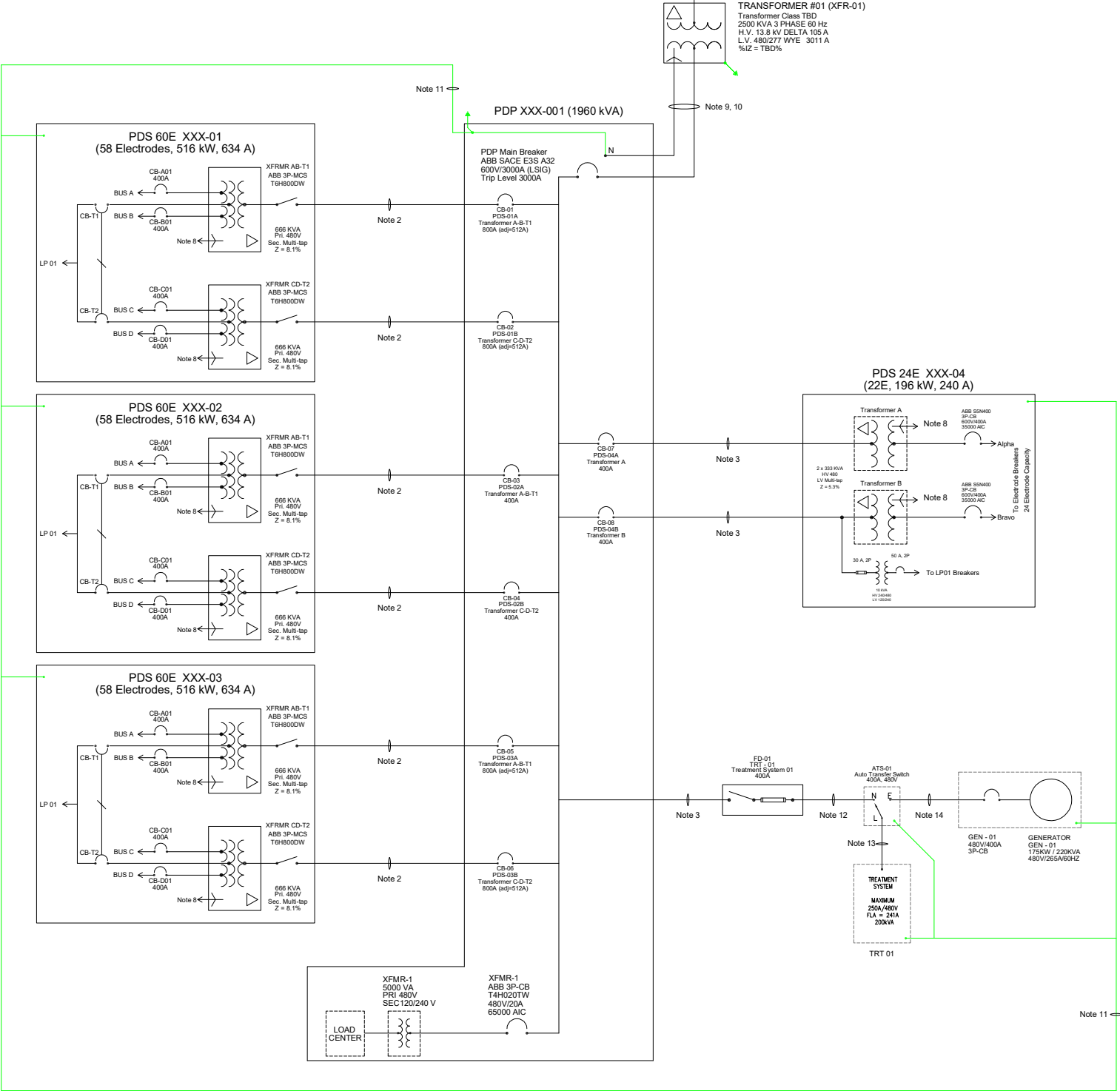
SHEET: **PFD-01**

From Site Distribution (NEW)

TOTAL ESTIMATED LOAD for TRANSFORMER #01
196 Electrodes and Treatment System = 1978 kVA / 2383 A

General Notes

- Construction and material shall comply with the National Electrical Code (NEC) along with applicable Federal, State and local jurisdiction codes.
- Cable from PDP XXX-001 distribution breakers to PDS 60E XXX-01, 02 & 03 will be two (2) parallel 3C-350 kcmil AWG AL c/w #2 Ground to each MCS switch AB-T1 and CD-T2: STR AL NUAL Alcan Type ACWU90 XLPE INS AIA BLK PVC JKT 600V 90C HL CSA C22.2 NO.51 or equivalent. Above ground installation.
- Cable from PDP XXX-001 distribution breakers to PDS 24E XXX-04 and from PDP XXX-001 bus to Fused Disconnect (FD-01) will be two (2) parallel 3C-250 kcmil AWG AL c/w #2 Ground to each A and B transformer: STR AL NUAL Alcan Type ACWU90 XLPE INS AIA BLK PVC JKT 600V 90C HL CSA C22.2 NO.51 or equivalent. Above ground installation.
- Cable from PDS Units to Wellfield Electrodes: 1C, #1/0 AWG CU Type DAA1048B Exane XLPE STR TNC 110C FT4 600V CSA/UL or equivalent.
- ET-DSP Neutral Reference Cable: 1C, #1/0 AWG CU Type DAA1048B Exane XLPE STR TNC 110C FT4 600V CSA/UL or equivalent.
- Maximum operating load for:
60E PDS unit (58 electrodes) is $58 \times 8.89 \text{ kW} = 516 \text{ kW}$.
24E PDS unit (22 electrodes) is $22 \times 8.89 \text{ kW} = 196 \text{ kW}$.
- All electrical equipment shall be grounded in accordance with NEC Article 250. Equipment is not to be earth grounded within 25 feet of electrode wellfield.
- ETDSP Neutral Reference Grounding scheme determined during commissioning and shall include all metal constructed extraction wells. ETDSP-N is connected to the XO connection point of PDS transformers A-B, C-D and A, B. These connections to be separate from utility ground.
- Power feed from Transformer 01 (XFR-01) to Power Distribution Panel (PDP) XXX-001 main breaker: Eight (8) parallel sets of conductors. Each set of conductors will be three (3) 750 kcmil Aluminum conductors and one (1) 300 kcmil Aluminum conductor. Conductors to be installed in conduit below ground.
- Transformer 01 (XFR 01) secondary wye point to be grounded to the service ground at PDP XXX-001.
- PDP, PDS, Treatment System, Generator, ATS, and WCS skid bases to be interconnected with a 2/0 ground cable that originates from electrical service ground at PDP XXX-001.
- Cable from Fused Disconnect (FD-01) to Auto Transfer Switch (ATS-01) will be two (2) parallel 3C-250 kcmil AWG AL c/w #2 Ground: STR AL NUAL Alcan Type ACWU90 XLPE INS AIA BLK PVC JKT 600V 90C HL CSA C22.2 NO.51 or equivalent. Above ground installation.
- Cable from Auto Transfer Switch (ATS-01) to Treatment System (TRT-01) will be two (2) parallel 3C-250 kcmil AWG AL c/w #2 Ground: STR AL NUAL Alcan Type ACWU90 XLPE INS AIA BLK PVC JKT 600V 90C HL CSA C22.2 NO.51 or equivalent. Above ground installation.
- Cable from Auto Transfer Switch (ATS-01) to Generator (GEN-01) will be two (2) parallel 3C-250 kcmil AWG AL c/w #2 Ground: STR AL NUAL Alcan Type ACWU90 XLPE INS AIA BLK PVC JKT 600V 90C HL CSA C22.2 NO.51 or equivalent. Above ground installation.
- Transformer 01 (XFR-01) requires a Delta primary and a Wye secondary to be compatible with Mc²'s ETDSP™ technology.**



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Jacobs

REV.	DATE	DESCRIPTION	DRAWN BY	REVD BY	APPD BY
B3	25/04/2023	90% DESIGN	DP	DP	ER
B2	07/02/2023	60% DESIGN	DP	DP	ER
B1	10/11/2022	30% DESIGN	DP	DP	
A2	08/02/2022	PRELIMINARY DESIGN	DP	DP	
A1	28/07/2022	PRELIMINARY DESIGN	DP	DP	
REV. (DDMMYYYY) DESCRIPTION			DRAWN BY REVD BY APPD BY		
APEGA PERMIT NUMBER P09178			SCALE: NTS		

TITLE:

Electrical Single Line ESL-01
90% Design

CLIENT:

Jacobs

PROJECT:

Essex-Hope Site
Jamestown, New York

SHEET:

ESL 01

Appendix C

Air Emissions Guidance and Correspondence



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Region 9

700 Delaware Avenue, Buffalo, NY 14209

P: (716) 851-7130 | F: (716) 851-7009

www.dec.ny.gov

December 7, 2022

VIA EMAIL ONLY

Garrett Hazebrouck
Jacobs Project Manager
120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

Dear Garrett Hazebrouck:

Air Permitting for In-Situ Thermal Treatment Essex-Hope State Superfund Site Jamestown, NY, Site #907015

Thank you for inquiring about the air permitting requirements for the proposed In-Situ Thermal Treatment Remediation for the Essex-Hope Site in Jamestown, NY (Site #907015). The New York State Department of Environmental Conservation (DEC) has reviewed the inquiry dated December 1, 2022.

The air emissions from the In-Situ Thermal Treatment process must comply with the *Guidance on Air Emissions of VOCs at DER Remediation Sites*. The guidance is attached. The applicant must demonstrate compliance with this guidance and submit supporting information, such as: emission calculations; justifications for any assumptions made; copies of references used; the operating plan for the treatment system including action thresholds, and monitoring parameters and frequencies.

Since this remedial project will take place under an Order on Consent and under the supervision of DEC's Division of Environmental Remediation, an air permit or registration is not needed. It is exempt from air permitting per 6 NYCRR 201-3.3(c) (29) "Remedial systems used to remediate soil and groundwater contamination that are required under the provisions of an order on consent or stipulation agreement, operated under the supervision of the department, and are properly controlled as required by the department."



Department of
Environmental
Conservation

You may direct any questions to me at 716-851-7130 michael.emery@dec.ny.gov or Joshua Vaccaro, the DER Project Manager, at 716-851-7220, joshua.vaccaro@dec.ny.gov.

Sincerely,

A handwritten signature in black ink that reads "Michael Emery". The script is cursive and fluid, with the first letters of "Michael" and "Emery" being capitalized and prominent.

Michael Emery, P.E.
Regional Engineer

ME/ds

Attachment - Guidance on Air Emissions of VOCs at DER Remediation Sites

cc : Joshua Vaccaro, Project Manager, NYSDEC Region 9
Audrey Sidebottom, Remediation Leader, Dow
Brian Carling, Site Manager, Jacobs

Guidance on Air Emissions of VOCs at DER Remediation Sites

The below represents technical guidance that has been developed by the Division of Environmental Remediation (DER) and the Division of Air Resources (DAR) technical staff to ensure that remedial systems meet the substantive requirements of DAR regulations. Nothing in this guidance restricts the ability of DEC to require treatment of air discharges from remedial systems which DEC or NYSDOH determines is necessary to protect human health or the environment.

Treatment Requirements for Volatile Organic Chemicals (VOCs):

The High Toxicity Air Contaminant (HTAC) List is provided in 6 NYCRR [Part 212-2.2 Table 2](#). For DER, the most common HTAC chemicals include:

- benzene,
- tetrachloroethylene (PCE),
- trichloroethylene (TCE),
- carbon tetrachloride, and
- vinyl chloride.

Treatment is required (as described in [Part 212-2.1](#)) for any remedial system that has a potential to emit greater than 0.1 lbs./hr. of a HTAC. Treatment is required below this level if the annual total emissions exceeds the Mass Emission Limit provided in [Table 2](#) (examples provided below).

Chemical Name	CASRN	Mass Emission Limit (pounds per year)	Calculated average pounds per hour
Carbon tetrachloride	56-23-5	100	0.011
Benzene	71-43-2	100	0.011
Vinyl Chloride	75-01-4	100	0.011
Trichloroethelene (TCE)	79-01-6	500	0.057
Perchloroethylene (PCE)	127-18-4	1000	0.11

If the remedial system does not have the potential to emit greater than 0.1 lbs./hr. of a HTAC and potential emissions are below the Mass Emission Limit, then no treatment and no further evaluation is required. If potential emissions are above the Mass Emission Limit, but below 0.1 lbs./hr., then treatment is required unless a Toxicity Impact Analysis is provided, in accordance with [DAR-1](#), demonstrating compliance with Annual Guideline Concentrations/Short-Term Guidance Concentrations (AGC/SGCs).

For non-HTAC volatile organic chemicals, treatment is required if the system has the potential to emit total VOCs at a rate greater than 0.5 lbs./hr.

The following systems require treatment based on DER experience:

- **Soil vapor extraction (SVE)** systems are expected to require treatment;
- **Thermal remediation** (in- or ex-situ) will generally require treatment;
- **Excavation enclosures:** Temporary structures in place to control vapors and odors from excavation of contaminated soils will generally require treatment.
- **Air strippers** generally would not require treatment, however, for larger systems or systems with HTACs, it is good practice to confirm this; and

- **Sub-slab depressurization systems (SSDS)** This guidance does not alter the requirement for compliance with the minimum requirements of the NYSDOH SVI guidance. Generally, SSDS do not require off-gas treatment. For larger systems or systems with HTACs, the need for treatment to comply with this *Guidance on Air Emissions at DER Remediation Sites* should be evaluated. For SSDS discharges unavoidably near receptors, treatment should be considered (e.g. dense residential/commercial neighborhoods).

Major Sources:

DAR has additional requirements for major sources of contamination, as described in [6NYCRR Part 201-2.1\(b\)\(21\)](#).

- For VOCs, the threshold to be considered a major source for the majority of the state is 50 tons/year. In the NY Metro Area (all of Long Island, New York City, Rockland County, Westchester County, and the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, and Woodbury) the threshold is 25 tons/year.
- For [hazardous air pollutants \(HAPs\)](#) statewide, the thresholds are 10 tons/year for any single HAP and 25 tons/year for any combination of HAPs.

If any of these thresholds may potentially be exceeded, DAR must be consulted to ensure that air treatment and discharge meet all applicable requirements.

Ozone Depleting Substances and Greenhouse Gases:

For any remediation option which would discharge chlorofluorocarbons (CFCs) or other ozone depleting substances (ODS), the Feasibility Study or Alternatives Analysis must evaluate the feasibility of treatment to minimize discharge of ODS. If treatment to minimize discharge of ODS is required, it must be called for in the Decision Document (such as the Record of Decision) using the remedy selection criteria found in [6 NYCRR Part 375-1.8\(f\)](#).

[DER-31](#) and [CP-49](#) require that the cleanup of remedial sites be considered in a larger context, including ODS and greenhouse gas (GHG) emissions. Some CFCs (as well as hydrofluorocarbons (HFC) and methane) are potent GHGs, some of which are thousands of times more potent than CO₂. Unnecessary discharge of these potent GHGs should be avoided.

The most common CFCs are Freons (e.g. Freon 114, Freon 11, Freon 23, Freon 12). Some of these are readily treated with activated carbon, but some are not. The following chart provides a comparison of the adsorption capacities for several Freon compounds relative to PCE and TCE:

Freon 23:	0.0001 gm adsorbed/100 gm carbon
Freon 12:	3.1 gm adsorbed/100 gm carbon
Freon 113:	20.0 gm adsorbed/100 gm carbon
TCE:	16.6 gm adsorbed/100 gm carbon
PCE:	27.5 gm adsorbed/100 gm carbon

Guidance on Air Emissions of VOCs at DER Remediation Sites

The below represents technical guidance that has been developed by the Division of Environmental Remediation (DER) and the Division of Air Resources (DAR) technical staff to ensure that remedial systems meet the substantive requirements of DAR regulations. Nothing in this guidance restricts the ability of DEC to require treatment of air discharges from remedial systems which DEC or NYSDOH determines is necessary to protect human health or the environment.

Treatment Requirements for Volatile Organic Chemicals (VOCs):

The High Toxicity Air Contaminant (HTAC) List is provided in 6 NYCRR [Part 212-2.2 Table 2](#). For DER, the most common HTAC chemicals include:

- benzene,
- tetrachloroethylene (PCE),
- trichloroethylene (TCE),
- carbon tetrachloride, and
- vinyl chloride.

Treatment is required (as described in [Part 212-2.1](#)) for any remedial system that has a potential to emit greater than 0.1 lbs./hr. of a HTAC. Treatment is required below this level if the annual total emissions exceeds the Mass Emission Limit provided in [Table 2](#) (examples provided below).

Chemical Name	CASRN	Mass Emission Limit (pounds per year)	Calculated average pounds per hour
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The following systems require treatment based on DER experience:

- **Soil vapor extraction (SVE)** systems are expected to require treatment;
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[DER-31](#) and [CP-49](#) require that the cleanup of remedial sites be considered in a larger context, including ODS and greenhouse gas (GHG) emissions. Some CFCs (as well as hydrofluorocarbons (HFC) and methane) are potent GHGs, some of which are thousands of times more potent than CO₂. Unnecessary discharge of these potent GHGs should be avoided.

The most common CFCs are Freons (e.g. Freon 114, Freon 11, Freon 23, Freon 12). Some of these are readily treated with activated carbon, but some are not. The following chart provides a comparison of the adsorption capacities for several Freon compounds relative to PCE and TCE:

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TCE:	16.6 gm adsorbed/100 gm carbon
PCE:	27.5 gm adsorbed/100 gm carbon

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Region 9
700 Delaware Avenue, Buffalo, NY 14209
P: (716) 851-7130 | F: (716) 851-7009
www.dec.ny.gov

May 15, 2023

VIA EMAIL ONLY

Garrett Hazebrouck
Jacobs Project Manager
120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

Dear Garrett Hazebrouck:

In-Situ Thermal Treatment Air Emissions Essex-Hope State Superfund Site Jamestown, NY, Site #907015

The New York State Department of Environmental Conservation (DEC) has reviewed Jacob's January 26, 2023 reply to DEC's December 7, 2022 request for more information about the proposed In-Situ Thermal Treatment Remediation for the Essex-Hope Site in Jamestown, NY (Site #907015).

The emission calculations are based off experience and modeling of soil and groundwater data, so the actual values are expected vary from those provided. Treating the emissions with the proposed vapor phase activated carbon (VGAC) treatment system will meet the *Guidance on Air Emissions of VOCs at DER Remediation Sites*. After controls, all the emissions are less than 50% of the emission thresholds in the guidance.

Monitoring and recording the VOC content in the exhaust stream after each VGAC vessels, as explained in your January 26, 2023 letter, will ensure that the emission control system is operating properly and in compliance with the guidance. The monitoring records must be made available to DEC staff upon request and a submission schedule included in the Construction Design Documents.

Garrett Hazebrouck
May 15, 2023
Page 2

You may direct any questions to me at 716-851-7130, michael.emery@dec.ny.gov, or to Joshua Vaccaro, the DER Project Manager, at 716-851-7220, joshua.vaccaro@dec.ny.gov.

Sincerely,

Michael Emery, P.E.
Regional Engineer

ME

cc : Joshua Vaccaro, Project Manager, NYSDEC Region 9
Audrey Sidebottom, Remediation Leader, Dow
Brian Carling, Site Manager, Jacobs



**Challenging today.
Reinventing tomorrow.**

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January 26, 2023

Attn: Michael Emery, P.E.
Regional Air Pollution Control Engineer – Division of Air Resources - Region 9
New York State Department of Environmental Conservation
700 Delaware Avenue
Buffalo, NY 14209 USA

Subject: Air Emission Permit Exemption Response for Upcoming In-Situ Thermal Treatment Remediation Project at NYSDEC Site #: 907015

Dear Mr. Emery,

On December 1, 2022, Jacobs sent a letter to New York State Department of Environmental Conservation's (NYSDEC) Division of Air Resources seeking NYSDEC's concurrence that an air emissions permit is not required for an in-situ thermal treatment (ISTT) system that will be implemented at the Essex-Hope State Superfund Site in Jamestown, NY (Site #: 907015) (site). On December 7, 2022, NYSDEC responded to Jacobs with a letter requesting additional information about the proposed ISTT system needed for NYSDEC to demonstrate the ISTT system would comply with NYSDEC's *Guidance on Air Emissions of VOCs at DER Remediation Sites*. As a result, this letter contains information as requested by NYSDEC that demonstrates that the proposed ISTT system will operate in compliance with the forementioned guidance.

The ISTT system will use electrical resistance heating (ERH) technology that will heat the subsurface to a temperature at which chlorinated volatile organic compounds (CVOCs) will volatilize. The primary CVOC constituents that impact the site are trichloroethene (TCE) (74% of mass) and cis-1,2-dichloroethene (cis-1,2-DCE) (24% of mass). A limited mass of vinyl chloride (VC) is also present (0.2% of mass). Once the CVOCs have volatilized, the impacted vapors and groundwater will be captured by a series of multi-phase extraction (MPE) wells and will be routed through an above ground treatment train. Groundwater separated from extracted vapors is treated in a series of steps including an air stripper. Air stripper off-gasses are combined with the extracted vapor stream and subsequently treated via vapor-phase granular activated carbon (VGAC). The treated effluent will then be emitted to the atmosphere.

As previously agreed, the remedial project will be conducted under an Order of Consent and under the supervision of NYSDEC's Division of Environmental Remediation. As such, an air permit or registration is not required per 6 NYCRR 201-3.3(c)(29).

Jacobs has completed calculations using subsurface CVOC mass estimates, CVOC removal rates, and VGAC control efficiency estimates to calculate emissions. Only uncontrolled emissions of TCE and VC could exceed thresholds provided in the agency's *Guidance on Air Emissions of VOCs at DER Remediation Sites*; however, the system will use VGAC to control vapors, with at least 95% control efficiency. Therefore, controlled emission rates are well below emission thresholds. These calculations are attached to this letter for reference and compared to DER Part 212-2.1 emissions thresholds.

- Key Assumptions:
 - o Estimated total mass of contaminant: 5,200 pounds (lbs.) is based on data from extensive subsurface investigations conducted at the site since the late 1990s.
 - o Emission calculations are conservative as it was assumed all mass in the subsurface is transferred to the vapor phase. In actual operation, some of the VOC mass will be treated in liquid phase and some will remain in the subsurface.

Date: 26 January 2023

Subject: Air Emission Permit Exemption Response for Upcoming In-Situ Thermal Treatment Remediation Project at NYSDEC Site #: 907015

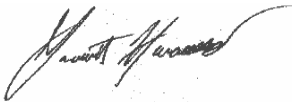
Jacobs

- o Length of ISTT System operation: **6-months**; which is based on the anticipated length of time needed for the ISTT system to reduce CVOC mass to a point when CVOC removal rates reach asymptotic returns.
- o Control Efficiency of VGAC: **95% removal**; which is based on industry estimates for VGAC's ability to remove TCE from vapor streams.

During operation, the above ground treatment train, which includes the VGAC vessels, will be monitored each business day using a Photo Ionization Detector (PID) to measure and record concentrations of VOCs in the exhaust stream. Vapor samples will also be collected monthly, at a minimum, and analyzed for TO-15 compounds at a New York-approved analytical laboratory. Samples will be collected at influent, mid-point and effluent sample locations, which will allow Jacobs to determine and monitor the VGAC control efficiency. Two VGAC vessels will be in operation in series at a time with a third, spare vessel on stand-by. Once vapor sampling indicates breakthrough on the lead carbon vessel may be occurring, the lead vessel will be removed from operation and VGAC will be changed out. The lag vessel will be moved to the lead position and the spare vessel will be put in the lag position.

Should you have questions, please reach out to Jacobs' project manager (Garrett Hazebrouck) at the phone number or email address listed below.

Sincerely,



Garrett Hazebrouck
Jacobs Project Manager
+401.965.0126
Garrett.Hazebrouck@jacobs.com

Carbon Copies :

- Audrey Sidebottom (Dow) – Remediation Leader
- Brian Carling (Jacobs) - Site Manager
- Joshua Vaccaro (NYSDEC – Division of Environmental Remediation) - Project Manager

Air Emissions Calculations for In-Situ Thermal Treatment Remediation Project at NYSDEC Site #: 907015

Assumed Duration of ISTT System Operation: 183 Days

	Essex-Hope Site Emissions Estimates				DER Part 212-2.1 Thresholds	
Compound	Mass in Source Area (lb.)	Uncontrolled Extraction Rate (lb./hr.)	Controlled Emission Rate (lb./hr.)	Controlled Emissions (lb./yr.)	lb./hr.	Mass Emissions Limit (lb./year)
Trichloroethene (TCE)	3848	0.88	0.04	192.4	0.1	500
Vinyl Chloride (VC)	104	0.024	0.00	5.2	0.1	100
cis-1,2-dichloroethene (cis-1,2 DCE)	1248	0.284	0.01	62.4	0.5	-
Total	5200	1.18	0.06	260	-	-

Notes:

1. CVOC mass in the source area is based on models that use soil and groundwater data collected by Jacobs and others over the last ~30 years, and the area of thermal influence. The calculation is conservative as it assumes all mass in the subsurface is transferred to the vapor phase. During actual operations, some of the VOC mass will be in a liquid phase and will be treated by the liquid-phase granular activated carbon system, and some will remain in the subsurface.
2. Length of ISTT system operation - Assumed to be 6 months. The system is designed to operate 24 hours a day, 7 days a week. Operation longer than 6 months will result in a lower lb./hr. value; as a result, the use of 6 months or 183 days is conservative.
3. VGAC Control efficiency - minimum of 95%

Appendix D

Community Air Monitoring Plan



**COMMUNITY AIR MONITORING PLAN
ESSEX-HOPE SUPERFUND SITE
OPERABLE UNIT (OU) 01
JAMESTOWN, NEW YORK**

1.0 Introduction

This Community Air Monitoring Plan (CAMP) has been prepared by McMillan-McGee Corp. (Mc²) in preparation for in situ thermal treatment (ISTT) at Operable Unit (OU) 01 of the Essex-Hope site, located at 126 Hopkins Avenue, Jamestown, New York (Site). Mc² will be overseeing the drilling of new wells at the Site on behalf of the client, Jacobs Engineering Group, Inc. (Jacobs). As part of the remedial design, a CAMP has been developed in accordance with the New York State Department of Health Generic CAMP (Appendix 1A) and Fugitive Dust and Particulate Monitoring procedures (Appendix 1B). This CAMP is to be used alongside the Site-specific health and safety plan (HASP). The Site-specific HASP provides details safety procedures and safeguards for on-site personnel, while the CAMP details dust and volatile organic compound (VOC) monitoring procedures intended to protect the community. Mc² will provide monitoring and maintain compliance with this CAMP on behalf of all subcontractors throughout the entire execution of their scope. Site characterization has been completed by Jacobs and other consultants prior to the ISTT project, such that all potential contaminants known or suspected of being present at OU-01 have been identified, and that no ionizing radiation, immediately dangerous to life or health conditions, or other dangerous conditions exists, such as the presence of flammable atmospheres and oxygen-deficient environments. The monitoring data associated with this CAMP will be made available to the New York Department of Environmental Conservation (NYSDEC) and/or the New York State Department of Health (NYSDOH) upon request, and all data will be provided to NYSDEC and NYSDOH by Jacobs following completion of the project.

2.0 Purpose

This CAMP will be implemented during all intrusive activities, such as the abandonment of pre-existing wells and the advancement of new wells. The purpose of the CAMP is to protect the community located downwind from the site from potential airborne contaminant releases as a result of remedial work activities performed at the Site.

3.0 Particulate Air Monitoring

Particulate monitoring will be conducted during intrusive work at the Site in accordance with the procedures listed within the Fugitive Dust and Particulate Monitoring from DER-10 Technical Guidance for Site Investigation and Remediation (Appendix 1B). Dust and particulate monitoring will be conducted upwind and immediately downwind of the Site and measurements will be recorded every 15 minutes. Dust monitoring may be suspended during periods of precipitation. Particulate air monitoring will be conducted using pDR-1000AN Monitor DataRAM Aerosol Monitor and Dataloggers (pDR-1000AN), which are real time passive sampling, light-scattering nephelometers manufactured by Thermo Scientific with a concentration measurement range of 0.001 to 400 milligrams per cubic meter (mg/m³). When intrusive activities are occurring, the dust monitoring devices will be checked, and measurements will be recorded every 15-minutes.

Particulate monitoring response and action levels include:

- If the downwind pDR-1000AN particulate level exceeds 150 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) over a 15-minute period, the upwind background level must be checked immediately. If the downwind particulate level is greater than 150 $\mu\text{g}/\text{m}^3$ and the downwind particulate level is 100 $\mu\text{g}/\text{m}^3$ greater than the upwind, dust suppression techniques will be implemented. Work will continue once dust suppression techniques are implemented, provided that downwind pDR-1000AN particulate levels do not exceed 150 $\mu\text{g}/\text{m}^3$.
- If airborne dust is observed migrating from the work area, then dust suppression techniques will be implemented. Work will continue with dust suppression techniques provided that dust is not visibly migrating from the work area.
- If, after implementation of dust suppression techniques, downwind pDR-1000AN particulate levels continue to exceed 150 $\mu\text{g}/\text{m}^3$, work will be stopped and NYSDEC will be notified. Work will resume if dust suppression measures are successful in reducing the downwind pDR-1000AN particulate concentration to below 150 $\mu\text{g}/\text{m}^3$ and in preventing visible dust migration.

4.0 Volatile Organic Compound Air Monitoring

VOC air monitoring will be conducted alongside the dust monitoring. VOC air monitoring will be conducted using a MiniRAE 3000 (10.6 eV) photoionization detector (PID) or equivalent. Continuous monitoring will be conducted during activities where it can reasonably be assumed that VOCs may be released to the atmosphere, such as:

- During coring, drilling, and subsurface installation or abandonment activities (e.g., when drilling returns or cuttings are collected above ground surface);
- During intrusive activities in the target treatment zone (e.g., opening a well to perform data collection or sampling activities);

VOC monitoring response and action levels include:

- If the ambient air concentration of total VOCs at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If the organic vapor level remains sustained above 5 ppm at the perimeter of the work area, activities will be shut down and work will be re-evaluated.

5.0 Documentation and Calibration

Field calibration of air monitoring equipment will be performed at the start of each day prior to performing other site activities and will comply with manufacturers' instructions. Calibration measurements will be recorded. Direct-reading instruments must also be maintained in accordance with manufacturers' instructions. Any instrument unable to calibrate against a known standard or suspected of being inaccurate will be immediately taken out of service and replaced with a new unit. Field

measurements will be recorded and available for State (NYSDEC and NYSDOH) personnel to review upon request. Upon completion of field activities, available monitored data recorded will be downloaded, evaluated, and summarized in the Project Completion Report to be developed and submitted to NYSDEC following demobilization from the Site.

6.0 Meteorological Data

Weather conditions, including the prevailing wind direction, will be observed and recorded each workday. Wind direction will be evaluated with a windsock, wind vane, or equivalent equipment at the start of each workday, and may be reestablished if a significant shift in wind direction is noted. Based on these results, the particulate and VOC monitoring equipment will be positioned accordingly upwind and downwind from the Site. Wind direction and monitoring station locations will be noted on daily field logs.

APPENDIX 1A: NYSDOH GENERIC CAMP

Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

**APPENDIX 1B: FUGITIVE DUST AND PARTICULATE MONITORING FROM DER-10 TECHNICAL GUIDANCE
FOR SITE INVESTIGATIONS AND REMEDIATION**

Appendix 1B

Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM₁₀) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
 - (f) Particle Size Range of Maximum Response: 0.1-10;
 - (g) Total Number of Data Points in Memory: 10,000;
 - (h) Logged Data: Each data point with average concentration, time/date and data point number
 - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
 - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
 - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
 - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
 - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.
5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM₁₀ at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix E

Citizen Participation Plan





Citizen Participation Plan

The Dow Chemical Company
907015

State Superfund Program
Essex-Hope Superfund Site

May 2023



Citizen Participation Plan

Client name: The Dow Chemical Company
Project name: State Superfund Program
Essex-Hope Superfund Site
Site No. 907015
Version: Final
Date: May 2023

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Acronyms and Abbreviations

COC	Certificate of Completion
CP	Citizen Participation (Plan)
CPM	Custom Production Manufacturing
DER	Division of Environmental Remediation
Dow	The Dow Chemical Company
EJSCREEN	Environmental Justice Screening and Mapping Tool
EPA	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
FS	Feasibility Study
IR	Information Repository
ISTT	In situ thermal treatment
NA	Natural attenuation
NPLS	North parking lot sump area
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PRAP	Proposed Remedial Action Plan
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SSF	State Superfund program
TAG	Technical Assistance Grant
TCE	Trichloroethene
UST	Underground storage tank
VOC	Volatile organic compound

Glossary of Terms¹

Air Sparging – also known as in situ air stripping and in situ volatilization, is an in situ (in-place) remediation technique used for the treatment of saturated (wet) soils and groundwater contaminated by volatile organic compounds (compounds that easily vaporize, such as gasoline, solvents, thinners). Works by injecting air into the ground, causing contaminants to move from water to air vapors. The process also enhances degradation of contaminants by increasing oxygen levels, allowing for the contaminants to be removed more easily.

Bi-Ox – photocatalysts (a substance that accelerates a chemical reaction upon exposure to light, without being consumed or undergoing any permanent change in its composition) that absorb light to break down pollutants.

Chemical Oxidation – used to transform harmful contaminants into less toxic chemicals; commonly described as *in situ* because it is conducted in place without soil excavation or groundwater pumping for aboveground cleanup.

Deed Restrictions – include a variety of limitations and conditions on the use of property, such as current and future uses of the property, the use of groundwater, or how soils are managed.

Engineering Controls – strategies designed to protect workers from hazardous conditions by placing a barrier between the worker and the hazard or by removing a hazardous substance through air ventilation.

Ethylbenzene – a colorless liquid organic compound that is highly flammable and is a component of gasoline and has a gasoline type odor.

Groundwater Containment –pumping contaminated groundwater to remove it from the ground or to keep the contaminated groundwater from migrating to other areas.

Groundwater Extraction System – a system developed to provide groundwater containment. These systems typically pump groundwater from below ground and treat it at the surface using a variety of different water treatment technologies.

Groundwater Use Restrictions – a government restriction directed at limiting or prohibiting certain uses of groundwater, which may include limitations or prohibitions on well drilling. Groundwater use restrictions may also be part of deed restrictions.

In situ – meaning *in place*, in situ remediation is the process by which contaminated soil or water is treated without removing the soil or groundwater. Examples include in situ air sparging, in situ thermal treatment, and in situ chemical oxidation.

Oxidation – a chemical reaction that takes place when a substance comes into contact with oxygen or another oxidizing substance. Examples of oxidation are rust and the brown color on a cut apple.

¹ New York State Department of Environmental Conservation. "Definitions – Types of Institutional Controls." <https://www.dec.ny.gov/chemical/8665.html>.

U.S. EPA. 2023. <https://www.epa.gov/chemical-research/indoor-semi-volatile-organic-compounds>

U.S. EPA. 2022. ROE Glossary. <https://www.epa.gov/report-environment/roe-glossary>.

U.S. EPA. n.d. "Community Guide to In Situ Thermal Treatment." <https://semspub.epa.gov/work/HQ/401607.pdf>.

Persulfate – salts used in environmental applications such as soil and groundwater remediation. Activated persulfate is a highly reactive remediation system that has sufficient longevity and transport characteristics to oxidize contaminants (in situ chemical oxidation).

Nano Iron – nanoscale (microscopic) iron particles are used in the transformation and detoxification of a wide variety of common environmental contaminants, such as chlorinated organic solvents, organochlorine pesticides, and polychlorinated biphenyls.

In Situ Thermal Treatment (ISTT) – in situ thermal treatment methods heat soil and groundwater to mobilize harmful chemicals in the soil and groundwater. The chemicals move through soil and groundwater toward wells where they are collected and piped to the ground surface to be treated. Some chemicals are destroyed underground during the heating process. Thermal treatment is described as *in situ* because the heat is applied underground directly to the contaminated area.

Institutional Control (IC) – administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Easements, covenants, ground water use restriction ordinances, zoning restrictions, and special building permit requirements are examples of ICs.

Land Use Control/Restriction (LUCs) – covenants restricting the use of land, recorded regulatory agreements, or any other form of an equitable servitude (examples include engineered and physical barriers, such as fences and security guards). LUCs help to minimize the potential for exposure to contamination and/or protect the integrity of a response action and are typically designed to work by limiting land and/or resource use or by providing information that helps modify or guide human behavior at a site.

Natural Attenuation (NA) – NA relies on natural processes (including bacteria) to decrease concentrations of contaminants in soil and groundwater. Monitoring of NA typically involves collecting soil and groundwater samples to analyze them for the presence of contaminants and other site characteristics.

Operable Unit (OU) – during cleanup, a site can be divided into a number of distinct areas called operable units that address geographic areas of a site, specific site problems, or areas where a specific action is required.

Polychlorinated Biphenyl (PCB) – a broad group of synthetic organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until manufacturing was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including transformers and industrial machinery.

Semivolatile Organic Compound (SVOC) – a subgroup of organic compounds that are of concern because of their potential for negative health effects on humans. SVOCs are slowly emitted from source materials, such as cleaning agents, personal care products, vinyl flooring, furniture, clothing, cookware, food packaging and electronics, and migrate in the gas phase, dissolved phase, and adsorbed to airborne particles.

Soil Vapor Extraction (SVE) – removal of contaminant vapors from below ground for treatment above ground. Vapors are the gases that form when certain chemicals evaporate.

Sub-slab Soil Vapor System – prevents contaminant vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside lessening the effects of vapor intrusion to the indoor space where it could be inhaled.

Toluene – a common ingredient in degreasers, it is a colorless liquid with a sweet smell and taste. Toluene evaporates quickly and is found naturally in crude oil and is used in oil refining and the manufacturing of paints, lacquers, explosives and glues.

Trichloroethene (TCE) – a synthetic chemical used as a solvent for degreasing metal parts during the manufacture of a variety of products.

Vapor Intrusion – the movement of chemical vapors from contaminated soil and groundwater into nearby buildings. Vapors primarily enter through openings in the building foundation or basement walls, such as cracks in the concrete slab, gaps around utility lines, and sumps. Vapor concentrations will be higher indoors when windows and doors remain closed.

Vapor Mitigation – vapor mitigation methods are classified as either passive or active. Passive vapor mitigation involves installing barriers such as sealing and filling cracks in floor slabs, around pipes and utility lines in walls to prevent the entry of chemical vapors. Active vapor mitigation is the practice of changing the pressure between the sub-slab and the inside of the building to keep chemical vapors out (refer to Sub-Slab Soil Vapor System).

Vinyl Chloride – vinyl chloride is a colorless, flammable liquid that evaporates quickly. It is used to make polyvinyl chloride pipes, wire coatings, vehicle upholstery, and plastic kitchenware.

Volatile Organic Compound (VOC) –compounds, many of which are human-made chemicals that are used and produced in the manufacture of paints, pharmaceuticals, and refrigerants. Examples of materials containing VOCs are paints and lacquers, fuels such as gasoline and diesel, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids, graphics and craft materials including some glues and adhesives, permanent markers, and photographic solutions. A class of VOCs called chlorinated solvent chemical compounds contain chlorine and have been widely used in various industries as degreasing agents and solvents; they are persistent in the environment.

Xylene –a colorless, flammable VOC liquid with a sweet odor. Exposure to xylene can irritate the eyes, nose, skin, and throat. In addition to being a component of gasoline, xylene is used as a solvent (a liquid that can dissolve other substances) in the printing, rubber, and leather industries. Along with other solvents, xylene is also widely used as a cleaning agent, a thinner for paint, and in varnishes.

Zero-Valent Iron Permeable Reactive Barrier Wall – permeable reactive barriers are technologies for groundwater remediation. A permeable barrier is a porous “barrier” that is placed in the path of a groundwater contaminant plume. The permeable portion of the barrier contains a reactive medium such as iron that helps remove the contaminants from the groundwater as it flows through the barrier.

1. What is New York's State Superfund Program?

New York's State Superfund Program (SSF) identifies and characterizes suspected inactive hazardous waste disposal sites. Sites that pose a potential significant threat to public health or the environment undergo a process of investigation, evaluation, cleanup, and monitoring.

The New York State Department of Environmental Conservation (NYSDEC) administers the SSF program with assistance and input from the New York State Department of Health (NYSDOH). When the parties responsible for the contamination of the site are known as "responsible parties," they often pay for or perform the investigation and evaluation of cleanup options under an enforceable consent order. At sites where responsible parties cannot be found or are unable or unwilling to fund an investigation, the state pays for the investigation and may try to recover costs from a responsible party after the investigation and cleanup are complete.

The SSF program contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. For more information about the SSF program, visit <http://www.dec.ny.gov/chemical/8439.html>.

NYSDEC oversees the investigation and cleanup of the Essex-Hope site, which is located at 126 Hopkins Avenue in the City of Jamestown, Chautauqua County, New York (Appendix A, Figure 1). Section 4 provides detailed site information, including the site description, history of use, investigation and cleanup to date.

2. Community Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable community members to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for community involvement and encourages early two-way communication with community members before decision-makers form or adopt final positions.

Involving the community affected and interested in site investigation and cleanup programs is important for many reasons, including the following:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment
- Improving public access to, and understanding of, issues and information related to a particular site and that site's remedial process
- Providing the community with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, state agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision-making

This *Citizen Participation (CP) Plan* provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the Essex-Hope site. The public information and involvement program will be carried out with assistance, as appropriate, by The Dow Chemical Company (Dow) and its contractors.

2.1 Project Contacts

NYSDEC project contacts to whom the public should address questions or request information about the site's investigation and cleanup program are listed in this section and in Appendix B. The public's suggestions about this CP Plan and the community participation program for the site are always welcome. Those interested are encouraged to share their ideas and suggestions with the project contacts at any time.

The NYSDEC project manager shares information about site cleanup activities with the public, local contractors, regulatory agencies, and other interested parties and organizations. The NYSDOH project manager provides health-related information about site remedial activities. Both contacts can provide accurate, timely, and easy-to-understand information to community members seeking information about site activities. Contact information for both the project manager and health officer will be provided in all outreach materials, including public notices, fact sheets, articles, announcements, and press releases. The public is encouraged to contact project staff at any time during the site investigation and cleanup process with questions, comments, or requests for information.

Project-related Questions

Joshua Vaccaro
Project Manager
NYSDEC, Environmental Remediation Division
270 Michigan Avenue
Buffalo, NY 14203
716.541.9657
joshua.vaccaro@dec.ny.gov

Site-related Health Questions

Angela Martin
NYSDOH, Environmental Exposure Investigation
Bureau
Corning Tower
Empire State Plaza
Albany, NY 12237
518.473.4671
angela.martin@health.ny.gov

2.2 Locations of Reports and Information

The locations of the reports and information that relate to the Essex-Hope site's investigation and cleanup program are known as Information Repositories (IRs). The IRs provide convenient access to important project documents for public review and comment.

The IRs may also include recent reports, fact sheets, and general information, along with instructions for accessing the IR file online. The locations of the IRs will be referenced in fact sheets, public notices, and other communications. The Essex-Hope IR will be maintained, as needed, to make documents available for public comment. The following IR locations are also provided in Appendix B:

James Prendergast Library

509 Cherry Street
Jamestown, NY 14701
716.484.7135 x226
Hours: Monday, Tuesday, Thursday, Friday: 10 a.m. to 8:30 p.m.
Wednesday: 10 a.m. to 5 p.m.
Saturday: 10 a.m. to 4 p.m.

Sunday: Closed

<https://www.prendergastlibrary.org>

NYSDEC Region 9 – Buffalo Office

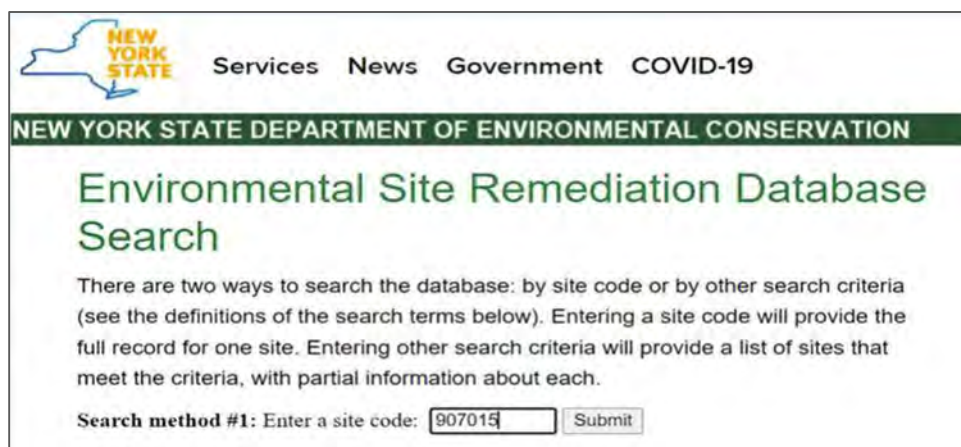
270 Michigan Avenue

Buffalo, NY 14203

Please call to schedule an appointment: 716.851.7220

All documents associated with the site are also available on NYSDEC's website, as follows:

- Access the following NYSDEC webpage:
<https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=3>.
- Enter "907015" in the search box next to "Search method #1" as shown below.



NEW YORK STATE Services News Government COVID-19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Environmental Site Remediation Database Search

There are two ways to search the database: by site code or by other search criteria (see the definitions of the search terms below). Entering a site code will provide the full record for one site. Entering other search criteria will provide a list of sites that meet the criteria, with partial information about each.

Search method #1: Enter a site code:

Dow will inform the public about where documents can be reviewed on fact sheets distributed about the site and by other means, as appropriate.

Demographic research shows that a high percentage of the population of the City of Jamestown have computers or smartphones and internet access.² A website enables community members to access key information about the environmental activities at the site on their own time and at minimal expense. Internet technology allows the latest information to be made available quickly and enables information to be delivered in a user-friendly manner and at the convenience of the user's schedule. Increasingly, people rely on the internet to obtain information. NYSDEC's Essex-Hope public website link will be referenced in future fact sheets and public notices. Demographic information for the City of Jamestown and County of Chautauqua, and State of New York for comparison, is located in Appendix C.

2.2.1 Site Contact List

The site contacts or stakeholder list is provided in Appendix D. This project-specific list was developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets providing updates about the project's status. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public meetings and comment periods. The site stakeholder list includes:

² U.S. Census data 2017-2021 show that 87% of Jamestown, New York, households have a computer and 78.2% have broadband internet access.

- Federal and state elected officials; County of Chautauqua and City of Jamestown elected officials
- Public works, planning board, utilities, health and other department and board heads for Chautauqua County, and Jamestown
- Residents, businesses, schools, child and senior care facilities, churches, and other community-based organizations near the site
- Representatives of the Seneca Nation
- Any person who has requested to be placed on the site contact list

The site contact list is reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact identified in Appendix B. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

2.3 Community Participation Activities

The public is informed about site-related community involvement activities through fact sheet distribution and public notices published at significant points during the site investigation and cleanup. Elements of the investigation and cleanup process that match up with the community participation activities are explained briefly in Section 5. The following sections include a general description of each community participation activity.

2.3.1 Fact Sheets

Fact sheets are brief documents intended to inform stakeholders about the progress of the investigation and cleanup process. Fact sheets are written for nontechnical audiences and use straightforward language and graphics to describe technical issues. The goal of a fact sheet is to provide stakeholders with current, accurate, and easy-to-understand information about the environmental cleanup activities at the Essex-Hope site.

A fact sheet was developed in March 2023 for the Essex-Hope site to provide general information including project contacts, where to get more information about the site, and how to be added to the mailing list. The March 2023 fact sheet was created to be shared with any interested parties that approach construction crews but will also be available at the IRs. The March 2023 fact sheet is provided in Appendix E.

Additional fact sheets will be developed to provide information about the upcoming public meeting and comment period related to the pending Record of Decision (ROD) amendment for an alternative site cleanup. Fact sheets will be distributed by the postal service, through DEC (Department of Environmental Conservation) Delivers listserv, and email. Fact sheet contents will include project contacts, where to obtain more information, and how to receive future notifications about the site.

Subsequent fact sheets about site activities will be distributed exclusively through the listserv except for households without internet access that have indicated the need to receive site information in paper form. The NYSDEC site project manager will be informed of any stakeholders who request hard-copy updates. Paper mailings may continue during the investigation and cleanup process, based on public interest and need. Fact sheets will also be available at the IRs.

2.3.2 Public Meetings

A public meeting is an open forum that usually features a presentation on a specific topic by members of the site cleanup project team, including project managers and regulators from NYSDEC. Public meetings provide community members with opportunities to learn about the status of site cleanup, receive responses to their questions and concerns, and submit comments on proposed actions or decisions. The public may contribute information, opinions, and perspectives that have potential to influence decisions about the site's investigation and cleanup. Public meetings can be hosted using a variety of meeting formats, including in-person, online, and hybrid. A public meeting will be held to present information about the ROD and to allow public comments.

2.3.3 Public Notices

Dow is required to publish public notices in local newspapers for various stages in the environmental restoration process, including announcing the availability of a 30-day public review and comment period and public meetings. A paid notice will be published in the most widely read local newspapers, such as *The Post Journal*, *Observer*, and *Times Observer*. The public notice will be placed in the metro or local section (not the classified section), preferably in the Sunday issue, which is typically the most widely read issue of daily papers. Public notices may also be published in the community calendar section of the local newspaper, ideally weekly for 1 month before the meeting. Contact information for local news publications is provided in Appendix D. Public notices may also be distributed to the site mailing list maintained by Dow.

2.3.4 Social Media

Social media is an increasingly important source of community information that can be conveniently accessed. Social media is one method of distributing brief messages or linking newspaper articles or other media sources. Social media sites allow quick and convenient messaging of site activities. Posts may include information about upcoming public meetings, how to access documents, and other sources of information such as fact sheets. Dow may encourage local municipalities and community organizations to share community outreach materials and public meeting information through their social media platforms.

2.3.5 Comment Periods

Public comment periods provide community members with an opportunity for meaningful involvement in the remediation process. They also provide NYSDEC and Dow with valuable information for use in decision-making. Public comment periods last a minimum of 30 days and give community members an opportunity to provide input on major decisions in the process, such as the selection of cleanup remedies.

When a public meeting is held during a public comment period, comments are captured during the meeting, and the meeting transcript becomes part of the final ROD. Community members may also submit written comments at any time during the public comment period. The comment period can be extended for an additional 30 days if requested by the public. As required, a written response is prepared for significant comments received and included in the ROD.

2.3.6 Responsiveness Summaries

At the end of the public comment period, a responsiveness summary will be prepared. The purpose of a responsiveness summary is to summarize the comments received during public comment periods. The

responsiveness summary will inform decision-makers about community preferences and general concerns. The responsiveness summary also provides the public with documentation of the concerns raised and NYSDEC and Dow's responses to those concerns. Responsiveness summaries are made available to the public as a part of the ROD and are placed in the IRs.

2.3.7 Technical Assistance Grant

If the site identified poses a significant threat to public health or the environment, a qualifying community group may apply for a Technical Assistance Grant (TAG). A TAG provides funds to the qualifying community group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being, or enjoyment of the environment may be affected by a release or threatened release of contamination at the site. For more information about TAGs, go to: <http://www.dec.ny.gov/regulations/2590.html>.

2.3.8 Citizen Participation Plan Updates

The needs of the community may change over time. An update ensures the CP Plan remains relevant to the community and its understanding of the site cleanup and related actions, assures public input is considered in the decision-making processes that affect communities, and helps Dow to be aware of and responsive to public concerns.

This Essex-Hope Site CP Plan may be revised as a result of changes in the nature and scope of investigation and cleanup activities, or should significant issues of public concern arise. Other modifications may include additions to the site contact list and changes in planned community participation activities. The NYSDEC project manager, in consultation with the assigned NYSDEC Community Participation Specialist and other NYSDEC staff as appropriate, will determine when this CP Plan will be updated. Table 1 shows the community participation activities and timing at different times in the investigation and cleanup process in general. The State Superfund Program Remedial Process flowchart in Appendix F shows how these community participation activities integrate with typical site investigations and cleanup processes.

Table 1. Community Participation Activities and Timing

Community Participation Activities	Timing of Community Participation Activity(ies)
Before Start of Remedial Investigation (RI):	
▪ Prepare site contact list ▪ Establish document repository ▪ Prepare Citizen Participation (CP) Plan ▪ Place approved RI Work Plan in document repository ▪ Distribute fact sheet to site contact list that announces availability of RI Work Plan and describes upcoming RI field work	Before start of RI. Note: Draft CP Plan must be submitted to NYSDEC within 20 days of effective date of Consent Order. CP Plan must be approved by NYSDEC before distribution.

Community Participation Activities		Timing of Community Participation Activity(ies)
When NYSDEC Approves Remedial Investigation Report:		
▪ Distribute fact sheet to site contact list that describes RI results ▪ Place approved RI Report in document repository		When NYSDEC approves RI Report
When NYSDEC Releases Proposed Remedial Action Plan (PRAP)		
▪ Place PRAP in document repository ▪ Distribute fact sheet to site contact list that describes PRAP and announces 30-day comment period and public meeting ▪ Conduct 30-day public comment period ▪ Hold public meeting about PRAP		When NYSDEC releases PRAP. Comment period begins/ends as per dates identified in fact sheet. Public meeting is held during the comment period.
When NYSDEC Issues Record of Decision (ROD):		
▪ Place ROD in document repository ▪ Distribute notice to site contact list that announces availability of ROD. ROD includes responsiveness summary of significant comments about PRAP		When NYSDEC issues ROD
Before Start of Remedial Action:		
▪ Distribute fact sheet to site contact list that describes upcoming remedial action		Before start of remedial action at the site
When NYSDEC Certifies Cleanup Requirements Achieved:		
▪ Distribute fact sheet to site contact list that announces cleanup requirements achieved ▪ If Certificate of Completion (COC) is issued, announce in fact sheet ▪ If COC is issued, place copy in document repository		When NYSDEC certifies cleanup requirements achieved, or within 10 days after NYSDEC issues COC or other similar site closure document
If NYSDEC Reclassifies the Site		
▪ If reclassifying site, may announce in fact sheet announcing achievement of cleanup requirements		At time NYSDEC proposes to reclassify the site
If NYSDEC Proposes to Delist the Site from the Registry of Contaminated Sites		
▪ Publish notice in Environmental Notice Bulletin about proposal and 30-day public comment period ▪ Distribute notice to site contact list. May announce proposal in fact sheet announcing achievement of cleanup requirements ▪ Conduct 30-day public comment period about proposed delist ▪ Distribute notice to site contact list when site is delisted		At time NYSDEC proposes to delist the site

3. Major Issues of Public Concern

Since environmental work at this site began in the 1990s, Dow and its consultants have had positive working relationships with the community. In the past, some environmental work has required access to neighboring properties through access agreements. Dow, its consultants, and neighboring property and business owners have worked collaboratively to ensure work can be completed.

To date, no significant issues or concerns have been expressed by community members about cleanup activities at the site. An internet media search conducted in April 2023 resulted in no online press or media about the site. Stakeholders, including members of the public, will have opportunities to express any interests or concerns at public meetings, during the public comment period, or in response to receipt of fact sheets related to the remedy process. Should any issues of public concern be identified during the site's investigation and cleanup process, Dow and NYSDEC will document and address those concerns raised, whether on an individual or group basis as appropriate. The public is welcome to contact the NYSDEC project manager with any questions or concerns.

3.1 Environmental Justice

An initial environmental justice screening was conducted using NYSDEC's mapping tool for environmental justice (<https://www.dec.ny.gov/public/911.html#Potential>). This tool identifies "Potential Environmental Justice Areas" at the Census-block group level of 250 to 500 households, that, in the last Census, had populations that met or exceeded at least one of the following statistical thresholds:

- At least 52.42% of the population in an urban area reported themselves to be members of minority groups
- At least 26.28% of the population in a rural area reported themselves to be members of minority groups
- At least 22.82% of the population in an urban or rural area had household incomes below the federal poverty level

Results of the initial screening using the NYSDEC tool indicated that the majority of the Census-block-group areas around the Essex-Hope site are identified as Potential Environmental Justice Areas (NYSDEC n.d.).

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," signed in 1994, directs federal agencies to include environmental justice as part of their overall mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (EO 12898). Environmental justice refers to the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

In addition, Executive Order 13985 "Advancing Racial Equity and Support for Underserved Communities," signed in January 2021, addresses the pursuit of a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality (EO 13985).

The U.S. Environmental Protection Agency (EPA) developed a comprehensive Environmental Justice Screening and Mapping Tool (EJSCREEN), which uses data on low-income and minority populations at the Census-block-group level from the U.S. Census Bureau's American Community Survey of the past 5 years

(EPA 2019). EJSCREEN compares this data with the rest of the state, EPA region, and the nation. The tool may help users identify areas with the following:

- Minority and low-income populations
- Potential environmental quality issues
- A combination of environmental and demographic indicators that is greater than usual

EJSCREEN was used to develop a demographic index for a defined region of influence around the Essex-Hope site. The demographic index is an average of two demographic indicators, specifically a low-income percentage and a minority percentage. Results of the EJSCREEN are shown in terms of percentiles, indicating the percentage of the U.S. population that has a higher value for low-income and minority indicators. Percentiles at or above 95% indicate those areas are of particular concern for environmental justice issues.

The area within a 1-mile radius of the Essex-Hope site is shown on Figure 2 (Appendix A). The site ranks in the 70 to 80 percentile for demographic information, and the adjacent area to the southwest of the site ranks in the 80 to 90 percentile. This environmental justice data will be used to help Dow better understand the environmental impacts affecting the surrounding community from multiple sources. The EJSCREEN helps inform project outreach efforts to communicate effectively, maintain transparency, and to be inclusive of all community members interested in and affected by environmental activities at the Essex-Hope site. Additional demographic information about Jamestown, Chautauqua County and New York for comparison is located in Appendix C.

3.2 Public Drinking Water

Drinking water for the City of Jamestown and the adjacent Village of Falconer is supplied by the Jamestown Board of Public Utilities. The system's groundwater is drawn from two underground reservoirs: the Cassadaga Aquifer and the Conewango Aquifer. The site is located over the Cassadaga Aquifer. . Drinking water is regularly tested to meet federal and NYSDOH drinking water standards (Jamestown BPU 2022).

3.3 Sensitive Receptors

Dow and NYSDEC are aware of potentially sensitive receptors – community members who might be sensitive to impacts associated with the Essex-Hope site. Table 2 shows seven schools, three childcare centers, and three senior care facilities located within an approximate 1-mile radius of the site.

Table 2. Essex-Hope Site Area Sensitive Receptors

Sensitive Receptor	Address Jamestown, NY 14701	Telephone
Carlyle C. Ring Elementary School	333 Buffalo Street	716-483-4407
Clinton V Bush Elementary	150 Pardee Avenue	716-483-4401
Daisy's Little Sprouts Child Care	18 Cross Street	716-708-6835
Edgewood Communities and Lutheran Senior Housing	715 Falconer Street	716-665-8137
Jamestown Area Senior Citizen Center	270 Newton Avenue	716-484-1627
Jamestown High School	350 E 2nd Street	716-483-3470
Love Elementary School	50 E 8th Street	716-483-4405

Sensitive Receptor	Address Jamestown, NY 14701	Telephone
Raymond J. Fashano Tech Academy	200 East 4th Street	716-483-4384
Resource Center Assisted Living Facility	32 Pleasantview Drive	716-665-6343
Ring Elementary School	333 Buffalo Street	716-483-4407
Rochelly Alvarez WeeCare	1044 N Main Street	716-309-4308
Tabatha Frederick WeeCare	52 Durant Avenue	716-219-3093
Washington Middle School	159 Buffalo Street	716-483-4413

4. Site Information

4.1 Site Description

The Essex-Hope site is approximately 4.7 acres, located at 126 Hopkins Avenue in the City of Jamestown, Chautauqua County, New York as shown on Figure 1 (Appendix A). The site is bounded by Hopkins Avenue to the north, Blackstone Avenue to the south, Angove Avenue to the west, and an industrial building to the east. The northern portion of the site is typically called the Plant 5 Building and the former north parking lot sump area (NPLS). Other areas of the site include paved areas, vegetated areas, a remedial system treatment building, and a Quonset hut as shown on Figure 3 (Appendix A).

The site is in an industrialized area with many metalworking shops and other manufacturing facilities in close proximity. The property to the north of the site, beyond Hopkins Avenue, is a vacant field previously occupied by Hope Windows Plant 6. To the east and northeast toward the Chadakoin River are several commercial properties or metalworking shops (Viking Property Development LLC [formerly H&H Metal Specialty Inc.], Johnson Machine, and Rollform) as well as several residences along Bigelow Street and Hopkins Avenue. Several manufacturing and commercial businesses are present to the south and southeast of the site, including Jamestown Metal Products. To the west and southwest of the site are United Alloys and Blackstone Advanced Technologies (sheet metal fabrication), respectively. Hope Windows Plants 1 and 3 are west and northwest of the site, respectively.

The site is currently used for storage. Historically, the site was used for metal, paint, and coatings manufacturing, which included the use of trichloroethene (TCE), a solvent typically used for degreasing metal parts. Appendix A contains Figures 1 and 3 identifying the location of the site and its features.

4.2 History of Site Use, Investigation, and Cleanup

4.2.1 Site History

Historically, two distinct operations occurred at the site. The northern portion of the site (along Hopkins Avenue) was occupied by Hope's Windows (Hope Plant 5) and was used to manufacture steel and aluminum windows. Following use by Hope's Windows, Essex Specialty Products, LLC, now a wholly owned subsidiary of Dow, operated the site as a raw materials warehouse. The southern portion of the site (along Blackstone Avenue) was occupied by Jamestown Finishes, which produced coatings and finishes.

The Plant 5 Building, shown on Figure 2, which is located between Hopkins Avenue and Blackstone Avenue, was used to manufacture aluminum windows and window screens from approximately 1951 to

1985, when Essex Specialty Products purchased the site. Essex Specialty Products used the Plant 5 Building as a raw materials warehouse until Custom Production Manufacturing (CPM) purchased the site in 2000. CPM used the Plant 5 Building for light manufacturing and metals fabrication between 2000 and 2021.

A TCE degreaser and a paint/primer tank were historically present in the southwestern corner of the Plant 5 Building but were both removed in 1985. The TCE and sludge in the degreaser pit are suspected to have been pumped out to the sump that was present in the NPLS area. Accidental spills of TCE have also been reported in the NPLS area. Numerous chemicals, including TCE, were in use by CPM in the Plant 5 Building until 2021. These historical operations are thought to be the cause of the contamination now present at the site. Current site-specific constituents of concern are volatile organic compounds (VOCs), including TCE, tetrachloroethene, vinyl chloride, benzene, toluene, ethylbenzene, and xylene.

The Plant 5 Building was sold to United Industries, Inc. in 2021. United Industries currently occupies the Plant 5 Building on a part-time, irregular basis for storage. The Plant 5 Building and the surrounding area located between Blackstone Avenue and Hopkins Avenue are referred to as Operable Unit 01 (OU-01).

4.2.2 Site Investigation and Cleanup

In 1990, Dow conducted a Remedial Investigation (RI) and Feasibility Study (FS) of the site under a consent order and under the oversight of NYSDEC and NYSDOH. The RI report achieved the following:

- Supported improved understanding of the nature and extent of contamination in soil, surface water, groundwater, and soil vapor
- Identified the contamination source(s)
- Assessed the impact of contamination on public health and the environment
- Provided information to support the development of a proposed remedy to address the contamination

During the RI, VOCs were detected in soil and groundwater. VOCs detected in soil included TCE and xylene. VOCs detected in groundwater above NYSDEC Groundwater Quality Standards included the following:

- Ethylbenzene
- Toluene
- Xylene
- TCE
- Vinyl chloride

Using information from the RI, the FS evaluated potential cleanup methods for site-related contamination. This evaluation included recommendations to reduce the risks posed by impacts at the site.

NYSDOH reviewed the RI/FS and made recommendations to ensure that Dow understood potential health impacts from the contamination, including identifying contaminant exposure pathways (e.g., through direct contact, eating, drinking, or breathing). The information gathered during the site investigation was summarized in the RI/FS, which is available for public review at the "Locations of Reports and Information" listed in Appendix B.

Based on the evaluation of potential cleanup or remedial alternatives in the FS and a subsequent public comment period, a ROD describing the selected cleanup alternatives was signed in 1994. The ROD prescribed the implementation of remedial actions at the site, which included a groundwater extraction and treatment system. The groundwater extraction and treatment system pumps impacted groundwater from the subsurface and passes the water through two vessels of liquid-phase granular activated carbon,

which remove VOCs from the water. The groundwater extraction and treatment system was expanded in 2008, and operation of the system continues (Jacobs 2023).

In 2000, Dow implemented a pilot scale zero-valent iron permeable reactive barrier wall around an extraction well to filter contaminants from groundwater before it was extracted to the surface for treatment. In addition, Dow implemented a pilot test involving injection of Bi-Ox that enhanced the natural degradation of the toluene and xylene in an area where underground storage tanks (USTs) existed. Enhanced degradation via Bi-Ox was deemed a partial success as it only partially remediated contaminants in this area. Because VOC impacts remained, all five USTs were removed and properly disposed of in 2002.

In 2005, a comprehensive site assessment indicated that a VOC groundwater plume was located north of the facility, mainly below a field to the north of Hopkins Avenue. A soil vapor investigation was also conducted to determine whether contaminants were being released from groundwater (through volatilization) to the air within the pore spaces of the unsaturated soil above groundwater, and then potentially released above ground where it has the potential to pose an exposure risk to those in indoor spaces.

To further refine the nature and extent of impacts to the site, a Data Gap Investigation Report was submitted to NYSDEC in 2018 that included a Soil Vapor Investigation Plan to determine down-plume impacts. An offsite vapor intrusion assessment was completed in 2018 and a supplemental soil and groundwater investigation was completed in 2019.

Although remedial activities completed to date have removed significant VOC and petroleum-related compound mass, elevated concentrations of site-related contaminants persist in soil and groundwater.

In summary, to date, the remedial technologies implemented at the site have included the following:

- Groundwater extraction and treatment including upgrading the groundwater extraction system to enhance capture across Hopkins Avenue in 2008
- Air sparging – adds pressurized air to the subsurface to encourage contamination to volatilize for collection
- Soil vapor extraction – uses a vacuum to remove contaminated air vapors from the unsaturated zone for treatment
- Soil excavation – to remove contaminated soil
- In situ chemical injection with oxidants, persulfate, and nano iron – uses nonhazardous oxidants, persulfates, or nano iron injected into the contaminated soil and groundwater to cause a chemical reaction, breaking down harmful contaminants
- Removal and disposal of five USTs
- Sub-slab soil vapor system installed in 2008 for a single residence north of Hopkins Avenue to collect and remove soil vapors from below the slab of the residence, which was designated as Operable Unit (OU) -02the house was demolished in 2020
- Institutional and engineering controls, including deed restrictions, vapor intrusion mitigation system, groundwater use restriction, groundwater treatment system, land use restrictions, and building use restrictions

As of 2023, Dow and NYSDEC are in the process of evaluating alternative remedial approaches and technologies that could support cleanup of the site in a shorter time frame compared to the current

groundwater extraction and treatment system. This evaluation is presented in the 2023 FFS for OU-01, which Dow submitted to NYSDEC in April 2023. During development of the OU-01 FFS, Dow and NYSDEC agreed to restructure the site's OUs. An OU is defined as a specific geographic area within the site with a particular type of contaminant, a particular phase of the cleanup process, or a combination of these factors. By breaking down the site into multiple OUs, Dow and NYSDEC can better prioritize cleanup of the areas that pose the highest risk to human health and/or the environment. The revised OU structure for the site is as follows:

- OU-00 – Site Management
- OU-01 – Onsite Remedial Program
- OU-01A – Interim Remedial Measure Soil Removal
- OU-02 – Residential Vapor Mitigation System
- OU-03 – Offsite Remedial Program

The data and information that Dow has collected to date indicate that the area with the most contamination is beneath the Plant 5 Building. The area in and around Plant 5 is referred to as OU-01 and is the focus of the OU-01 FFS submitted in 2023. Once NYSDEC approves the OU-01 FFS, NYSDEC will issue an amendment to the 1994 ROD that will allow a new remediation technology to be implemented at OU-01. In addition, the ROD amendment will also include requirements that Dow continue collecting data from other areas of the site and continue evaluating potential remediation technologies.

The OU-01 FFS evaluates a series of four remediation technologies that, if implemented, could help the site achieve established Remedial Action Objectives (RAOs). The remediation goals and RAOs that currently apply to the site include the following:

- Eliminate the potential for direct human or animal contact with the contaminated soils onsite.
- Mitigate the impacts of contaminated groundwater to the environment.
- Mitigate, to the extent practicable, migration of contaminants from onsite source areas to groundwater.
- Provide for attainment of RAOs for groundwater and soil quality (Jacobs 2023).

4.2.3 OU-01 Focused Feasibility Study

Although remedial activities completed to date have removed a significant VOC and petroleum-related compound mass, elevated concentrations of site-related contaminants remain in certain areas of the site. Investigation efforts as part of a multiphase supplemental investigation identified that site impacts are significant, both in concentration magnitude and extent, and that previous and ongoing remedial efforts, although beneficial, appear unlikely to achieve the remedial goals for OU-01 in the foreseeable future. Accordingly, the objective of the OU-01 FFS was to evaluate a more technologically effective remedial alternative that will achieve remedial goals for OU-01 in an acceptable time frame while ensuring continued protection of human health and the environment during remediation (Jacobs 2023).

To protect public health and the potential for exposure to site contaminants at all site OUs, including OU-01, institutional controls consisting of a Declaration of Covenants and Restrictions were registered in February 2014 with the Chautauqua County Clerk and includes the following provisions:

- Prohibits the use of the property for any purpose other than industrial uses without a written waiver by NYSDEC
- Prohibits the construction, use, or occupancy of the site that results in disturbance or excavation which threatens the integrity of engineering controls or results in unacceptable human exposure to contaminated soils without written approval from NYSDEC

- Prohibits disturbing, removing, or interfering with installation, use, operation, and maintenance of engineering controls required for the remedy without a written waiver from NYSDEC
- Prohibits the use of groundwater under the site without necessary water quality treatment for drinking water or industrial purposes
- Requires the property owner to periodically certify that the institutional and engineering controls put in place are unchanged
- Requires the property owner to continue in full force and effect any institutional controls required for the remedy and maintain such controls
- Covenant will run with the land and be binding upon all future owners of the property
- Any deed of conveyance for the property shall recite that the conveyance is subject to the Declaration of Covenants and Restrictions

The OU-01 FFS describes the rationale for each of the four alternatives and their primary components in detail; however, all four alternatives include the following common components:

- Continued implementation of institutional controls at the site
- Continued implementation of engineering controls at the site in the form of low-permeability asphalt and concrete covers
- Implementation of natural attenuation (NA) with monitoring at OU-01, in areas not treated or contained by the primary OU-01 remedy, and after the primary OU-01 remedy has been completed

The four remedial alternatives evaluated in the OU-01 FFS are as follows:

- **Alternative 1** – Continuation of Existing Extraction and Treatment System
- **Alternative 2** – Enhancement of Existing Extraction and Treatment System
- **Alternative 3** – In Situ Thermal Treatment (ISTT) with NA with Monitoring
- **Alternative 4** – ISTT of the Onsite VOC Area and In Situ Chemical Oxidation of the Petroleum Area

Overall protectiveness of public health and the environment is also addressed in the OU-01 FFS. Currently, the site poses no risk for exposure to VOC and petroleum impacts.

As of May 2023, NYSDEC is in the process of reviewing the OU-01 FFS. Upon approval of the OU-01 FFS, NYSDEC will issue an OU-01 ROD amendment for public review, hold a public meeting, and accept public comments during a 30-day public comment period. At the completion of the public comment period, Dow will coordinate with NYSDEC to respond to public comments and NYSDEC will issue a Revised ROD.

As Dow continues to collect data and information from other OUs at the site, these data, and evaluations of any future remedial technologies, will be submitted to NYSDEC for review. In addition, when Dow plans to implement remedial alternatives at other OUs, Dow will coordinate with NYSDEC to establish ROD amendment(s) and this CP Plan will be updated accordingly (Jacobs 2023).

4.3 Remedial Design

After the OU-01 ROD amendment has been issued, Dow will submit a Remedial Design (RD) for the selected remedial alternative to NYSDEC for review. Upon NYSDEC's approval of the RD, Dow will implement the remedy.

For OU-03, Dow will develop and submit an RI/FS work plan to NYSDEC for review within 90 days of the new Order on Consent being issued. Upon NYSDEC's approval of the OU-03 RI/FS work plan, Dow will

conduct investigations at the site and use the data collected during the investigations to evaluate potential remedial technologies for OU-03 in an FFS. Dow will then submit a final RI/FS Report summarizing the findings of the investigation and remedial alternative evaluation to NYSDEC for review. Based on the recommendations from the final OU-03 RI/FS Report, Dow will then complete an RD, which will be submitted to NYSDEC for review and approval before any technology is implemented at OU-03.

4.4 Selected Remedy and Record of Decision

NYSDEC will consider public comments and select the remedy to address contamination related to OU-01. The selected remedy will be described in the site's ROD amendment, which explains why the remedy was selected and provides responses to public comments. The ROD amendment will be available for review with other reports and site information at the RIs and the NYSDEC website. Dow will then submit the RD for the remedial technology selected for OU-01 to NYSDEC for review and approval. Upon NYSDEC's approval, the project will then be constructed, and implemented to address the site contamination.

4.5 Certificate of Completion

When cleanup actions have been completed, NYSDEC will approve or prepare a Final Engineering Report that describes the cleanup actions undertaken and certifies that cleanup requirements have been achieved or will be achieved. Upon approval of the Final Engineering Report, NYSDEC may issue a Certificate of Completion (COC). The COC would recognize the findings of the Final Engineering Report and note that the cleanup program achieved a cleanup level consistent with specific categories of use for the site. The recipient of the COC would be entitled to limited liability if it complies with the terms of the COC and other conditions.

4.6 Site Management

Site management is the last phase of the site cleanup program. For the Essex-Hope site, site management is defined as OU-00. Site management may be conducted by NYSDEC, or by Dow under NYSDEC oversight, if contamination remains in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a site management plan. Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater.

An institutional control is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses. An engineering control is a physical barrier or method to manage contamination. Examples include caps, covers, barriers, fences, and treatment of water supplies. Institutional and engineering controls for the Essex-Hope site include the following:

- Deed restriction
- Groundwater use restriction
- Groundwater treatment system
- Land use restriction
- Building use restriction
- Operation and management plan

Site management will continue until NYSDEC determines that it is no longer needed. During the site management phase, NYSDEC may also take steps to reclassify the site or delist the site from the Registry. All site-related documents are available for public review at the "Locations of Reports and Information" listed in Appendix B.

5. References

Executive Order (EO) 12898 of February 11, 1994. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." *Federal Register*. Vol. 59, Issue 32 (February 16, 1994).

Executive Order (EO) 13985 of January 20, 2021. "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government." *Federal Register*. Vol 86, Issue 14 (January 25, 2021).

Jacobs. 2022. In-Situ Thermal Treatment Performance Work Statement Essex-Hope Site Jamestown, New York. June.

Jacobs. 2023. Focused Feasibility Study Essex Specialty Products, LLC Operable Unit 01 Essex-Hope Site Jamestown, New York. April.

Jamestown Board of Public Utilities (Jamestown BPU). 2022. *Jamestown BPU Annual Water Quality Report Year 2022*. Jamestown Board of Public Utilities Water Territory, Jamestown, New York. Accessed April 18, 2023. <https://www.jamestownbpu.com/ArchiveCenter/ViewFile/Item/1212>.

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U.S. Census Bureau. 2020. "Quick Facts United States: Jamestown, Chautauqua County, New York." <https://www.census.gov/quickfacts>.

U.S. Environmental Protection Agency (EPA). 2019. EJScreen: "Environmental Justice Screening and Mapping Tool." Accessed April 21, 2023. <https://www.epa.gov/ejscreen>.

Appendix A

Figures



Appendix A. Figures

Figure 1. Site Location



Figure 2. Results of EJSCREEN for Essex-Hope Region of Influence

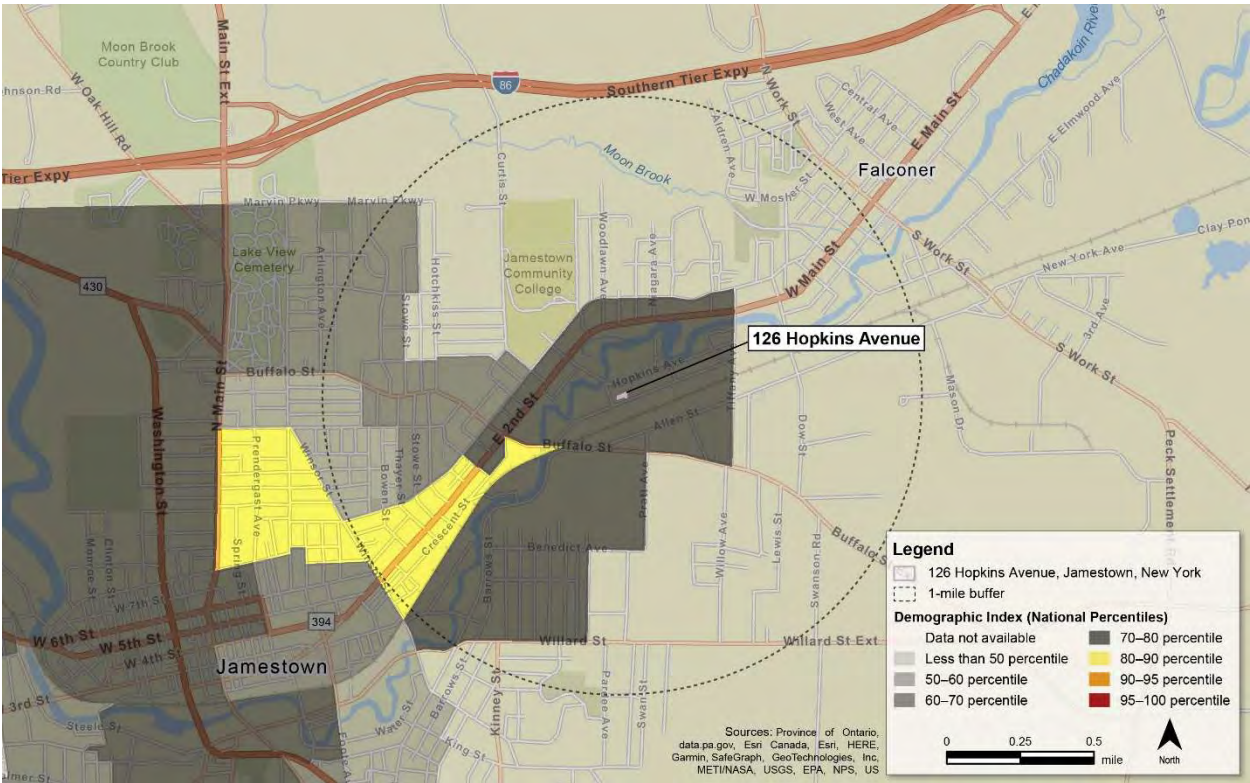


Figure 3. Site Features



Appendix B

Project Contacts and Locations of Reports and Information



Appendix B. Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

NYSDEC Project Manager
Joshua Vaccaro
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, NY 14203
716.541.9657
joshua.vaccaro@dec.ny.gov

Citizen Participation Specialist
NYSDEC Megan Gollwitzer
Office of Communication Services
700 Delaware Avenue
Buffalo, NY 14209
716.851.7201
megan.gollwitzer@dec.ny.gov

New York State Department of Health (NYSDOH):

Angela Martin
NYSDOH
Corning Tower
Empire State Plaza
Albany, NY 12237
518.473.4671
angela.martin@health.ny.gov

Locations of Reports and Information

The following facilities are being used to provide the public with convenient access to important project documents:

James Prendergast Library
509 Cherry Street, Jamestown, NY 14701
716.484.7135
Hours: Monday, Tuesday, Thursday, Friday: 10 a.m. to 8:30 p.m.
Wednesday: 10 a.m. to 5 p.m.
Saturday: 10 a.m. to 4 p.m.
Sunday: Closed
<https://www.prendergastlibrary.org>

NYSDEC Region 9 – Buffalo Office
270 Michigan Avenue
Buffalo, NY 14203
Please call to schedule an appointment: 716.851.7220

NYSDEC's website: Type the following link into an internet browser, then enter "907015" in the search box next to "Search method #1": <https://www.dec.ny.gov/cfm/external/index.cfm?pageid=3>.

Appendix C

Demographic Information Jamestown

New York



Citizen Participation Plan

	City of Jamestown	Chautauqua County	State of New York
Total population, April 2010 ^a	31, 146	134,905	20,201,249
Total population, April 2021 ^b	28,712	127,657	19,378,102
Percent change (2010–2021)	-7.8%	-5.4%	-4%
American Indian and Alaska Native alone, percent	0.2%	0.8%	1%
Asian alone, percent	0.2%	0.7%	9.3%
Black or African American alone, percent ^a	2.5%	2.9%	17.6%
Hispanic or Latino ^b , percent	10.6%	8.1%	19.5%
Native Hawaiian and other Pacific Islander alone, percent	0.0%	0.1%	0.1%
White alone, percent	87.6%	93.2%	69.1%
White alone, not Hispanic or Latino	82.3%	86.6%	54.7%
Civilian labor force (16 years+) 2017–2021	57.7%	55.4%	62.9%
Median household income (in 2021 dollars), 2017–2021	\$36,162	\$50,408	\$75,175
Persons living in poverty, percent	28.1%	17.%	13.9%
Language other than English spoken at home, percent of persons age 5 years+, 2017–2021	8.8%	8.1%	30.5%
Households with a computer, percent, 2017–2021	85.6%	87.7%	92.2%
Households with broadband Internet, percent, 2017–2021	78.2%	81.8%	86.9%

U.S. Census April 14, 2023 <https://www.census.gov/quickfacts/NY>

<https://www.census.gov/quickfacts/jamestowncitynewyork>

<https://www.census.gov/quickfacts/chautauquacountynewyork>

^a Includes persons reporting only one race

^b Hispanics may be of any race, so also are included in applicable race categories

Appendix D

Site Contact List



Appendix D. Site Contacts

Federal Elected Officials

U.S. Senator Kristen Gillibrand
Larkin At Exchange
726 Exchange Street, Suite 511
Buffalo, NY 14210

U.S. Senator Chuck Schumer
130 South Elmwood Avenue, #660
Buffalo, NY 14202

U.S. Representative District 23 Nick Langworthy
Jamestown Office
2 East 2nd Street, Suite 208
Jamestown, NY 14701
will.smith@mail.house.gov

New York State Elected Officials

Governor of New York State Kathy Hochul
NYS State Capitol Building
Albany, NY 12224
joan.ksener@exec.ny.gov

New York State Senator George Borello
Fenton Building
2-6 E. Second Street, Suite 302
Jamestown, NY 14701
borrello@nysenate.gov

New York State District 150 Representative Andy Goodell
Fenton Building
2 E. 2nd Street, Suite 320
Jamestown, NY 14701

Local Elected Officials

Chautauqua County

County Executive Paul M. Wendel, Jr.
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Public Works Director Jeffery Lehman, P.E.
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P.O. Box 27, Jamestown NY 14702

dheitzenrater@chautauquachamber.org

Chautauqua Opportunities, Inc. Chair Rebecca Brumagin

17 W. Courtney Street Dunkirk, New York

info@chautopp.org

Department of Development/Jamestown Urban Renewal Agency (JURA) Director Crystal D. Surdyk

200 East Third Street

Jamestown NY 14701

surdyk@jamestownny.gov

Jamestown Community Chamber of Commerce, Carrie Swanson

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cswanson@chautauquachamber.org

Seneca Nation

President Rickey L. Armstrong, Sr.

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mark.powless@sni.org

Environmental Groups

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1600 Riverside Road

Jamestown, NY 14701

info@auduboncnc.org

Chautauqua Watershed Conservancy, Executive Director John Jablonski III

P.O. Box 45 / 71 East Fairmount Avenue

Lakewood, NY 14750

info@chautauquawatershed.org

Chautauqua Institution Director Michael E. Hill, Ed.D.

One Ames Avenue

Chautauqua, N.Y. 14722

infooffice@chq.org

Civic and Community Groups

Habitat for Humanity- Chautauqua Area

16 W Main Street

Fredonia, NY 14063-2117

boardcahfh@gmail.com

Jamestown Renaissance Corp Neighborhood Coordinator Mary Maxwell
200 E 3rd Street, Floor 3
Jamestown, NY 14701
mary@jamestownrenaissance.org

Kiwanis Jamestown Secretary Cindy Alpaugh
cindy.alpaugh@yahoo.com

Laughlin Community Action Center
402 Chandler Street Jamestown, NY 14701
info@chautopp.org

League of Women Voters of Chautauqua County President Mary Croxton
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Jamestown, NY 14701
apearson@rtpi.org

Rotary Club of Jamestown President John Healy
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Jamestown, NY 14702-0454

Cornell Cooperative Extension of Chautauqua County Emily Reynolds, Executive Director
Emily Reynolds, Executive Director
eck47@cornell.edu

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Jamestown New York 14701
info@jamestowngazette.com
<https://jamestowngazette.com/>

Jamestown Post-Journal
P.O. Box 3386
Jamestown, NY 14702-3386
Advertising Director: Debra Brunner
dbrunner@post-journal.com
<https://www.post-journal.com/>

Observer
P.O. Box 391
Dunkirk, NY 14048-0391
Advertising Director: Debra Brunner
dbrunner@post-journal.com
<https://www.observertoday.com/>

Adjacent Businesses; Jamestown, NY 14701

Ahlstrom Schaeffer Electric Corporation; 46 Hopkins Avenue

Blackstone Advanced Technologies, LLC; 86 Blackstone Avenue

The Chassis Shop; 148 Blackstone Avenue

Chautauqua County Medical Transport; 234 Blackstone Avenue

Contract Interior Solutions, LLC; 86 Blackstone Avenue

Hope Windows, Inc.; 84 Hopkins Avenue

Jamestown Bronze Works Inc; 174 Hopkins Avenue

Jamestown Mattress Co.; 178 Blackstone Avenue

Johnson Machine; 142 Hopkins Avenue

Rollform United Alloys; 181 Blackstone Avenue

Schaefer Plumbing Supply Co; 132 Blackstone Avenue

Treadle Town; 155 Blackstone Avenue

United Industries Inc. of Jamestown; 146 Blackstone Avenue

Viking Property Development LLC; 153 and 159 Hopkins Avenue

Appendix E

Fact Sheet



Essex-Hope Site Fact Sheet

March 2023

Jamestown, New York

NYSDEC Site Code: 907015

Site Background

The Essex-Hope site is a 4.7-acre site located in an industrial area at 126 Hopkins Avenue in the City of Jamestown, Chautauqua County. Essex Specialty Products purchased this site in the late 1940s and operated it as a paint/coatings manufacturer until 1988. In the early 1980s Essex purchased a portion of the adjacent Hope Window Company plant. In 1988, Essex Chemical sold the facility to Lilly Industrial Coatings, Inc. Operations led to the disposal and releases of various chlorinated solvents and hydrocarbons, such as toluene, xylene, trichloroethene, and perchloroethene.

Cleanup Activities

Past cleanup actions at the site have included excavating contaminated soil and replacing it with clean soil, treating some soil with vacuum extraction to remove contamination from soils, and removing of underground storage tanks. As of 2023, continuous pumping of contaminated groundwater to the surface for treatment is ongoing and will continue until alternate remedial technologies are approved by the New York State Department of Environmental Conservation (NYSDEC). To ensure a comprehensive cleanup, Essex and its consultant, Jacobs, with oversight provided by NYSDEC, are in the process of evaluating the implementation of new and innovative remediation technologies. In addition, under NYSDEC's supervision, Essex and Jacobs will continue to collect soil and groundwater data needed to monitor and understand the site and to better design any future remedial technologies.

Questions?

To be added to the mailing list, please contact the NYSDEC project manager listed below.

Project Related Questions
Mr. Joshua Vaccaro
Project Manager
NYSDEC, Division of
Environmental Remediation
270 Michigan Avenue
Buffalo, NY 14203
(716) 541-9657
joshua.vaccaro@dec.ny.gov

Site-Related Health Questions
Angela Martin
NYSDOH
Corning Tower
Empire State Plaza
Albany, NY 12237
(518) 473-4671
Angela.Martin@health.ny.gov



Where to Find Information

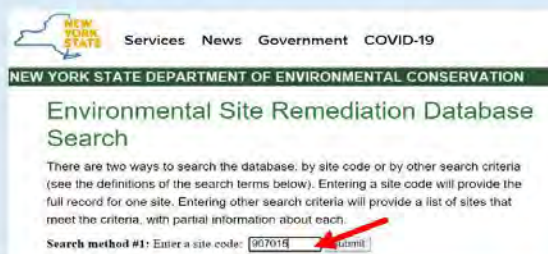
Project documents are available at the following locations to help the public stay informed about the site and the cleanup process. These documents include the decision document describing the selected remedy for the site, called the "Record of Decision."

James Prendergast Library
509 Cherry St.
Jamestown, NY
(716) 484-7135
Hours:
M,T,Th,F: 10 am to 8:30 pm
W: 10 am to 5 pm
Sat: 10 am to 4 pm
Sun: Closed

NYSDEC
Region 9 - Buffalo Office
270 Michigan Avenue
Buffalo, NY 14203
Please call (716) 851-7220 to
make an appointment.

All documents associated with the site are also available on NYSDEC's website. Type the following link into an internet browser, then enter '907015' in the search box next to 'Search Method #1' as shown below:

<https://www.dec.ny.gov/cfm/x/xtapps/derexternal/index.cfm?pageid=3>

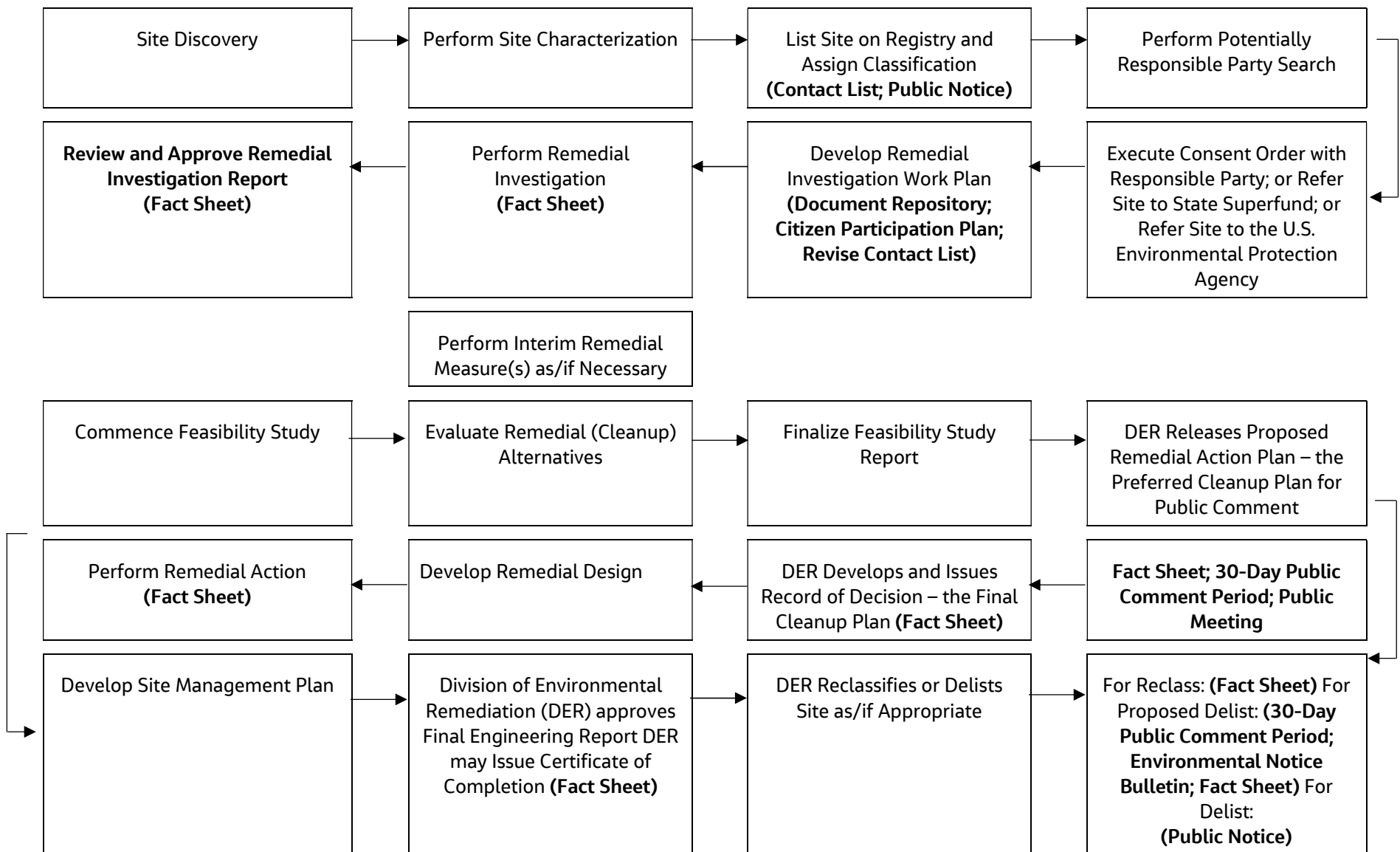


Appendix F

State Superfund Program Remedial Process



Citizen Participation Plan



Note: Community participation activities are in **Bold**.

Appendix F
City of Jamestown BPU – Industrial
Wastewater Discharge Permit for the
Essex-Hope Site



CITY OF JAMESTOWN
BOARD OF PUBLIC UTILITIES
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

PERMIT NUMBER	26
INDUSTRY NAME	Essex Specialty Products, Inc
INDUSTRY ADDRESS	125 Blackstone Avenue, Jamestown
SIC NUMBER	Groundwater Remediation
DATE ISSUED	11/4/22
EXPIRATION DATE	11/3/27

Essex Specialty Products, Inc. as a Significant Industrial User (SIU) of the City of Jamestown Publicly Owned Treatment Works (POTW), is hereby issued an industrial wastewater discharge permit pursuant to Chapter 24A of the Jamestown City Code (Jamestown Sewer Use Ordinance) and also with any applicable provisions of federal or state law(s) or regulation(s). Said permit shall be effective for a period of five years from the date of issuance hereof.

This permit is granted in accordance with the application filed on March 12, 1996 and notice of process modifications submitted on N/A and in conformity with the plans, specifications, semi-annual self monitoring reports, and other data submitted to the City in support of the above application, all of which are filed with and considered as part of this permit, together with the following named conditions and requirements:

Effective this 4th day of November, 2022
To expire the 3th day of November, 2027



WWTP Chief Operator- Board of Public Utilities

RIGHT OF ENTRY

The permittee shall allow duly authorized employees or representatives of the City to enter the permittee's premises for the purpose of inspection, observation, measurement, sampling, and testing in accordance with Article VIII of the Jamestown Sewer Use Ordinance.

SAMPLING MANHOLE REQUIREMENTS

If, in the opinion of the General Manager, there are not adequate facilities for the acquisition of representative samples and accurate flow measurements, the General Manager may require that a sampling manhole with flow measuring device be installed by the permittee at his expense. This sampling manhole shall be approved by this office before installation. The permittee shall be responsible for all maintenance of the sampling manhole and calibration of the monitoring equipment.

BOARD OF PUBLIC UTILITIES MONITORING

Compliance with the Jamestown Sewer Use Ordinance will be monitored via wastewater discharge monitoring. The City of Jamestown will monitor each SIU four times per year. Results will be transmitted to each SIU.

SELF MONITORING

Essex Specialty Products, Inc. must conduct monthly self-monitoring and report results to the City in accordance with applicable federal and local regulations. Monthly reports are due each **August 1** (including months January through June) and **February 1** (including months July through December). Essex Specialty Products, Inc. must notify the City of any violation of its self-monitoring within 24 hours. Such notification shall include a phone call followed up by a letter. All permit limits set forth in this permit are enforceable effluent limitations.

MONITORING LOCATION
SAMPLING VALVE

PARAMETER	SAMPLE	LOCAL
	Monthly	LIMIT
		MG/L
PH (4 grabs)	X	5.5-10.0
TSS (comp)		350
OIL & GREASE		100
CADMIUM (comp)		0.30
CHROMIUM (comp)		4.00
COPPER (comp)		1.25
LEAD (comp)		0.30
NICKEL (comp)		0.90
SILVER (comp)		0.20
ZINC (comp)		3.00
CYANIDE (comp)		0.65
Volatile Organics (4 grabs)	X	2.13

Notes:

1. Samples should be taken as **composites** of at least 4 grab samples collected during a typical production day except for pH. Four separate samples must be taken and **individually analyzed for pH**.
2. All analysis shall be preformed by a New York State Department of Health Certified Environmental Laboratory.
3. All analysis shall be performed in accordance with the latest edition of the following references:
 - a. Standard Methods for the Examination of Water and Wastewater
 - b. Method for Chemical Analysis of Water and Wastes, USEPA, technology Transfer, 1983

PROHIBITED DISCHARGES

The following should not be introduced into the City Sewer system:

- (1) Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21.
- (2) Pollutants which will cause corrosive structural damage to the POTW, but in no case Discharges with pH lower than **5.5** or greater than **10.0**;
- (3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in Interference;
- (4) Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a Discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW.
- (5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40 deg.C (104 deg.F) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits.
- (6) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
- (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;
- (8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.
- (9) The discharge of concentrated solutions without pretreatment is strictly prohibited. Any request to discharge such wastes must be submitted to this office and is subject to the approval of the General Manager on a case by case basis.
- 10) Any water or waste containing fats, wax, grease, oils, or oil products, whether emulsified or not, in excess of **100 mg/l**.

HAZARDOUS WASTE DISCHARGE NOTIFICATION

For discharges of listed and characteristic hazardous wastes which are not already reported in periodic self-monitoring reports and which exceed 15 kilograms per month, the regulations require that all industrial users notify USEPA, NYSDEC, and the City of Jamestown as to the constituents of these wastes and the anticipated discharge volume of such wastes on both a monthly and an annual basis.

CHANGE IN WASTEWATER DISCHARGE

All discharges authorized herein shall comply with the terms and conditions of this permit. Any industrial facility expansions, production increases, or process modifications which result in new, different, or increased discharges of pollutants must be reported by submission of a new industrial waste disposal questionnaire. This permit may be modified to specify and limit any pollutants not previously limited. The discharge of any pollutant more frequently than or at a level in excess of that specified and authorized by this permit shall constitute a violation of the terms and conditions of this permit.

RECORDKEEPING

The permittee shall retain all records of monitoring activities and results (whether or not required by this permit) for a minimum of 3 years. These records shall be made available for inspection and copying to duly authorized employees or representatives of the City. This period of retention shall be extended during any unresolved litigation.

PERMIT MODIFICATIONS

After sufficient notice to the permittee, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

- (a) Violation of any terms or conditions of this permit.
- (b) A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
- (c) If an effluent standard is established under any state or federal law for a pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit.

PERMIT TRANSFER

Sewer Use Permits are issued to a specific User for a specific operation. A wastewater discharge permit shall not be reassigned or, transferred, or sold to a new owner, new User, different premise, or a new or changed operation without the approval of the City. Any succeeding Owner or User shall also comply with the terms and conditions of the existing permit.

NOTICE OF NON-COMPLIANCE

The permittee shall notify the Chief Operator of the Jamestown Wastewater Treatment Plant **immediately**, by telephone (716-661-1653), so that the plant operator can take the necessary steps to prevent damage to the wastewater treatment process and equipment in the event the permittee:

- (1) Does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit.
- (2) Discharges or may discharge any wastewater which may cause a slug loading to the Jamestown Wastewater Treatment Plant. This includes wastewater which may cause pass through or interference with wastewater treatment plant operations.
- (3) Discharges or may discharge any material or wastewater which is prohibited from discharge as described in the City of Jamestown Local Sewer Use Ordinance or this permit.

These non-complying discharges or possible discharges may be due to:

Breakdown of industrial wastewater pretreatment equipment;
Accidents caused by human error or negligence; or
Other causes, such as acts of nature.

The General Manager shall be notified by telephone within 24 hours, and in writing within five (5) days and said notification shall include the following pertinent information:

- (1) A description of the non-complying discharge;
- (2) Cause of non-compliance;
- (3) Anticipated time the condition of non-compliance is expected to continue, or if such condition has been corrected, the duration of the period of non-compliance;
- (4) Steps taken by the permittee to reduce and eliminate the non-complying discharge; and
- (5) Steps to be taken by the permittee to prevent reoccurrence of the condition of non-compliance.

The permittee must also repeat sampling for all parameters exceeding discharge limitations and submit the results of the repeat analysis within thirty (30) days of the violation(s).

Nothing in this permit shall be construed to relieve the permittee from the penalties for non-compliance of this permit for any reason subject to Article (IX) (Penalties) of the Jamestown Sewer Ordinance.

SCHEDULE OF COMPLIANCE

The permittee shall comply with the following schedule if the present discharge does not conform to the effluent limitations described within this permit:

- a. By _____ the permittee shall have a registered Professional Engineer contact this office.
- b. By _____ the permittee shall complete an engineering report and submit it to this office.
- c. By _____ the permittee shall complete final plans and specifications for pretreatment facilities and submit them to this office for review and approval.
- d. By _____ the permittee shall start construction of its approved pretreatment facilities.
- e. By _____ the permittee shall complete construction of the pretreatment facilities.
- f. By _____ the permittee shall attain operational levels required to achieve the effluent limits specified within this permit.

CIVIL AND CRIMINAL PENALTIES

A permittee found violating applicable local, state or federal regulations may be subject to administrative penalties, civil action, and/or criminal prosecution. If administrative penalties are warranted, a fine in an amount not exceeding \$1000.00 per day per violation may be assessed. If criminal penalties are assessed, a fine in an amount not exceeding \$1,000.00 per violation per day may be assessed, imprisonment for not more than 6 months, or both. Any person violating applicable local, state or federal regulations that results in expense, loss or damage to the City and its property shall be liable for all costs.

Appendix G

Design Comment Letters and Responses



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9
700 Delaware Avenue, Buffalo, NY 14209
P: (716) 851-7220 | F: (716) 851-7275
www.dec.ny.gov

September 12, 2023

Audrey Sidebottom, P.E.
The Dow Chemical Company
715 Main Street
Midland, MI 48674

**Re: Remedial Design Report
Essex; Hope Site – 907015
Jamestown, Chautauqua County**

Dear Audrey Sidebottom,

The New York State Department of Environmental Conservation (NYSDEC), in conjunction with the New York State Department of Health (NYSDOH), have received the draft *Remedial Design Report* [August 2023], as submitted on behalf of The Dow Chemical Company. Based on our review we have the following comments:

General Comments

1. The Remedial Design Report details the remedial actions with respect to the In-situ Thermal Treatment (ISTT) activities planned for the site. Will a separate Remedial Design Report be submitted for the In-situ Chemical Oxidant Injection (ISCO) component of the proposed remedy?;
2. A Health and Safety Plan (HASP) should be included along with the resubmission of this report;

Report Comments

3. **Section 2.2.2, Hydrology:** Section 2.2.2. discusses the potable supply wells for City of Jamestown. This section should be revised to incorporate the distance of the potable supply wells with respect to the site;
4. **Section 2.3, Nature and Extent of Contamination (Bullet 5):** Monitoring well MW-7DD was resampled in May 2023, please provide the results of this sample event;

5. **Section 3.1, Regulatory Framework:** *“This report assumes that NYSDEC will accept the RAOs proposed in the FFS.”* The NYSDEC has released the proposed Amendment to the Record of Decision (AROD) which details the proposed Remedial Action Objectives for the site. The text should be revised to be consistent with the AROD;
6. **Section 3.2, Target Treatment Zone Definition:** Within Section 3.2 and throughout the Report the extent of the treatment zone is defined by subsurface sample locations displaying chlorinated volatile organic compound (CVOCs) concentrations exceeding 25 milligrams per kilogram. The protection of groundwater soil cleanup objectives (PGW SCOs) are applicable to the contaminants of concern that are impacting groundwater at this site. The Report should be revised to indicate that the PGW SCOs are applicable at this site and the treatment should be designed to address on-site exceedances of PGW SCOs. If areas exceeding PGW SCOs are not proposed for treatment it needs to be clearly explained why it is not feasible to do so;
7. **Section 3.3.2, ISTT Remediation Objectives:** Section 3.3.3. states that the operation of the system may be discontinued at Dow’s discretion. Prior to system shut down, a request that provides supporting rationale to shut down the system must be submitted to the NYSDEC for review and approval. This section and any additional reference to this statement should be revised throughout the report;
8. **Section 4.2, ISTT System Design:**
 - a. Additional information should be provided to describe the installation of the 4 angled extraction wells displayed on Figure WFL-01;
 - b. **Bullet 7:** Within the text please provide clarification on the treatment system that will be utilized during the implementation of the ISTT remedy;
9. **Section 4.3, Permitting and Regulatory Compliance:**
 - a. The text should be revised to incorporate a description of the alarm/notification system;
 - b. **Bullet 20:** For clarity, the specific RCRA regulations should be referenced;
10. **Section 4.3.2, Air Emissions:** The NYSDEC Division of Air has been provided a draft copy of the Remedial Design Report for their review. Please note, additional comments with respect to air emissions may be forthcoming;
11. **Section 4.3.3, Underground Injection Control:** Please provided clarification on the discharge of effluent water from the treatment system. This section states that treated water may be reinjection into the subsurface while Section 4.3.4 along with the Jamestown Industrial Wastewater Discharge Permit indicate discharge to public utilities. Please note, any ground surface discharges are subject to the short-term discharge memorandum (attached for reference) or a State Pollutant Discharge Elimination System (SPDES) requirement;

12. Section 4.4, Site Preparation:

- a. With respect monitoring wells planned for abandonment. Are there any concerns with regard to polyvinyl chloride melting? Specifically, will melting induce further contaminant migration, the release of additional volatiles, and what impact will this have on the treatment system?;
- b. Please include a figure to support Table 4-2. The Figure should display the monitoring wells that will be decommissioned at the site. Following the completion of the ISTT remedy select monitoring wells will require replacement;

13. Section 4.5, Subsurface Construction: The construction of in-situ components will require the advancement of borings. The Report should discuss the management of an investigation derived wastes (IDW) generated during system construction;

14. Section 5, Remedy Operation: Table 5-1 provides a summary of the monitoring activities. A section should be included to further describe the monitoring frequencies within the text;

15. Section 5.1.1.4, Pressure: If the subsurface pressure is inadequate, what measures will be taken to improve the systems capture and prevent the release of soil vapor;

16. Section 5.1.2, Performance Monitoring and System Shutdown:

- a. It is not clear how monitoring for potential exposure via escaped vapor through preferential pathways (street drains, grates, building cracks, perforations in pavement, etc.) will be conducted. This should be described in Section 5.1.2. Please include additional information to detail the proactive/preventative measures beyond the soil vapor extraction system.

If any component of the SVE is disrupted or compromised, untreated vapor may escape to the outdoor air as the buffer from ground surface is only 10 feet deep. Escaped/untreated vapors should be avoided. There should be no odor coming from the site during this work;

- b. Post remedial performance monitoring is discussed within this Report. A work plan detailing the post remedial performance monitoring plan (including any subsurface soil sampling) should be submitted to the NYSDEC and NYSDOH for review and approval;

17. Section 5.2, Post-Thermal Treatment Sampling: Post remedial monitoring may require follow-up sampling of additional medias including subsurface soils, groundwater, and soil vapor to evaluate the site conditions and the potential for contaminant rebound;

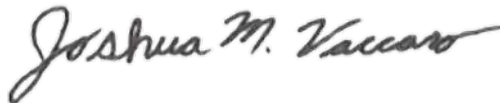
18. Figure WFL-1, IST Well Field Layout:

- a. Based on Figure WFL-1, it is not clear if the proposed extraction wells will extract both groundwater and soil vapor. Please provide clarification in the notes and/or legend sections of Figure WFL-1;
- b. There are 10 proposed 'vacuum monitoring wells'. Based on the scale provided in this figure, it is not clear if this is a sufficient number of wells/points are proposed to determine the extent of the pressure field and if vapor may be moving offsite; and

19. Appendix D, CAMP: It is not clear if a Community Air Monitoring Plan (CAMP) will be implemented during the entire 180 days of ISTT. Please provide more detail to the CAMP as it relates to the ISTT installation and operation.

Please submit a revised Remedial Design Report addressing the above comments to the NYSDEC. If you have any questions regarding the above comments, please feel free to contact me at joshua.vaccaro@dec.ny.gov or (716) 541-9657.

Sincerely,



Joshua M. Vaccaro
Project Manger

Ec:

Mike Cruden – NYSDEC, Bureau Director
Andria Caprio – NYSDEC, Region Hazardous Waste Remediation Engineer
Benjamin McPherson – NYSDEC, Project Supervisor
Gregory Scholand, Esq. – NYSDEC, Project Attorney
Charlotte Bethany – NYSDOH, DOH Region Chief
Angela Martin – NYSDOH, DOH Project Manager
Audrey Sidebottom – Dow, Project Manager (asidebottom@dow.com)
Joel Visser, Esq. – Dow, Project Attorney (jvisser@dow.com)
Tyson Campbell – DuPont (tyson.e.campbell@dupont.com)
Garrett Hazebrouck – Jacobs (Garrett.Hazebrouck@jacobs.com)
Brian Carling – Jacobs (brian.carling@jacobs.com)
Ben Thompson – Jacobs (ben.thompson1@jacobs.com)

New York State Department of Environmental Conservation

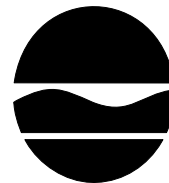
Division of Water

Bureau of Water Permits, 4th Floor

625 Broadway, Albany, New York 12233-3505

Phone: (518) 402-8111 • FAX: (518) 402-9029

Website: www.dec.ny.gov



MEMORANDUM

TO: Robert Schick, Director, Division of Environmental Remediation

FROM: Mark Klotz, Director, Division of Water /s/

RE: Generic Effluent Criteria for Groundwater Discharges

Date: August 28, 2013

This memo is to transmit a general authorization for short term, batch groundwater discharges of water generated at remediation sites under the Division of Environmental Remediation's programs. These waters may be generated during sampling, pump tests, well development, and dewatering of excavations. The attached generic groundwater effluent criteria and general conditions were developed by DOW staff to reduce delays in implementing these short term groundwater discharges and to save staff time for both Divisions. Please have your staff pay particular attention to the footnotes listed at the end of the document.

The attached criteria are subject to the following conditions:

1. The attached criteria do not contain discharge limitations for radioactive discharges. Limitations on discharges of radiation or radioactive isotopes are addressed under Part 380 Radiation Control Permits.
2. Alternate frequencies, discharges limitations (where appropriate) or inclusion of parameters not identified in the attachments will be considered; however, a complete review by DOW staff will be required.
3. The attached parameter list is extensive and DOW's intent is for monitoring to be conducted only for those parameters which are known or suspected to be present at the site. Monitoring of parameters not present is not required by these criteria.

Additionally, for excavation dewatering:

1. Prior to beginning work, DER will review and approve the methods plan and equipment list of the proposed water treatment and handling system(s). The approved method plan will include provisions that fully comply with the conditions in this memo. This approval will be limited in duration to the term specified in the construction contract.

2. Approval for each batch discharges from temporary storage tanks (21,000 gallon tanks, approximately) will be granted based upon review and approval of sampling results by the Department and Engineer demonstrating that the treatment achieved compliance with the specified discharge criteria developed for site specific contaminants of concern. Representative samples shall be collected after approved water treatment has been completed and before it enters the temporary storage tank at a frequency of 1 sample per 7000 gallons treated. If any sample fails to meet the discharge criteria, it shall be assumed that the entire storage volume does not meet the discharge criteria. In such cases, the water will require re-treatment and re-sampling as specified above, demonstrating compliance before discharge will be allowed. Discharge rate limitations and infiltration design may be required to protect against erosion and prevent overland flow.

Division of Environmental Remediation (DER) will be responsible for ensuring compliance with the attached effluent criteria and approval of all engineering submissions. **Footnote 9** requires identification of the DER contact person who will receive all effluent results, engineering submissions and modification requests. The Regional Water Engineer should be kept apprised of the status of this discharge and sent copy of the effluent results for informational purposes.

Long term groundwater and both short and long term surface water discharges are not addressed in the attached criteria. A complete review of these proposed discharge scenarios will require full DOW review. All such requests should be directed to the Director of the Bureau of Water Permits in DOW.

If you have any questions, please call Brian Baker at 402-8124 or Shayne Mitchell at 402-8125.

Attachments

c: Regional Water Engineers
 Koon Tang, DOW

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning: _____ with the start of each discharge event

and lasting until: _____ 7 days from the start of the discharge.

The discharges from the treatment facility to **Groundwater** shall be limited and monitored by the operator as specified below:

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
				Measurement Frequency	Sample Type	
Outfall 001 – Containerized Well Development Water and/or Pump Test Water						
Flow	NA	Monitor	GPD	Continuous	Recorder	
pH (range)	NA	6.5 – 8.5	SU		Grab	
Oil and Grease	NA	15	mg/l	1	Grab	
Solids, Total Dissolved *applies only in the counties of Nassau and Suffolk	NA	1000*	mg/l	1	Grab	
Nitrogen, Total (as N) *applies only in the counties of Nassau and Suffolk	NA	10*	mg/l	1	Grab	
Foaming agents (as MBAS)	NA	1	mg/l	1	Grab	
Acenaphthene	83-32-9	20	µg/l	1	Grab	
Acetaldehyde	75-07-0	8	µg/l	1	Grab	
Acetone	67-64-1	50	µg/l	1	Grab	2
Acrolein	107-02-8	5	µg/l	1	Grab	
Acrylamide	79-06-1	5	µg/l	1	Grab	
Acrylic acid	79-10-7	50	µg/l	1	Grab	
Acrylonitrile	107-13-1	5	µg/l	1	Grab	
Alachlor	15972-60-8	0.5	µg/l	1	Grab	
Aldicarb *Refer to entry for “Aldicarb and Methomyl.”	116-06-3	0.35*	µg/l	1	Grab	2
Aldicarb sulfone	1646-88-4	2	µg/l	1	Grab	
Aldicarb sulfoxide	1646-87-3	4	µg/l	1	Grab	
Aldrin	309-00-2	ND	µg/l	1	Grab	3
Alkyl dimethyl benzyl ammonium chloride	68391-01-5	50	µg/l	1	Grab	
Alkyl diphenyl oxide sulfonates	NA	50	µg/l	1	Grab	
Allyl chloride	107-05-1	5	µg/l	1	Grab	
Aluminum	NA	2,000	µg/l	1	Grab	
Ametryn	834-12-8	50	µg/l	1	Grab	
4-Aminobiphenyl	92-67-1	5	µg/l	1	Grab	
Aminocresols *see Phenolic compounds – total phenols	95-84-1	*	µg/l	1	Grab	
Aminomethylene phosphonic acids salts *applies to each aminomethylene phosphonic acid salts individually	NA	50*	µg/l	1	Grab	
Aminopyridines *Applies to the sum of these substances	462-08-8	1*	µg/l	1	Grab	
3-Aminotoluene	108-44-1	5	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement Frequency	Sample Type	
4-Aminotoluene	106-49-0	5	µg/l	1	Grab	
Aniline	62-53-3	5	µg/l	1	Grab	2
Anthracene	120-12-7	50	µg/l	1	Grab	
Antimony	NA	6	µg/l	1	Grab	
Arsenic	NA	50	µg/l	1	Grab	
Aryltiazoles *applies to each aryltiazole individually	NA	50*	µg/l	1	Grab	
Asbestos	NA	14,000,000	fibers/L	1	Grab	
Atrazine	1912-24-9	7.5	µg/l	1	Grab	
Azinphosmethyl	86-50-0	4.4	µg/l	1	Grab	
Azobenzene	103-33-3	5	µg/l	1	Grab	
Barium	NA	2,000	µg/l	1	Grab	
Benefin	1861-40-1	35	µg/l	1	Grab	
Benz(a)anthracene	56-55-3	0.002	µg/l	1	Grab	2
Benzene	71-43-2	1	µg/l	1	Grab	
Benzidine	92-87-5	5	µg/l	1	Grab	
Benzisothiazole	271-61-4	50	µg/l	1	Grab	
Benzo(b)flouranthene	205-99-2	0.002	µg/l	1	Grab	2
Benzo(k)fluoranthene	207-08-9	0.002	µg/l	1	Grab	2
Benzo(a)pyrene	50-32-8	ND	µg/l	1	Grab	3
Beryllium	NA	3	µg/l	1	Grab	
1-1’-Biphenyl	92-52-4	5	µg/l	1	Grab	
Bis(2-chloroethoxy)methane	111-91-1	5	µg/l	1	Grab	
Bis(2-chloroethyl)ether	111-44-4	1.0	µg/l	1	Grab	
Bis(chloromethyl)ether	542-88-1	5	µg/l	1	Grab	
Bis(2-chloro-1-methylethyl)ether	108-60-1	5	µg/l	1	Grab	
Bis(2-ethylhexl)phthalate	117-81-7	5	µg/l	1	Grab	
Boric acid, Borates & Metaborates *applies as boron equivalents to the sum of these substances.	NA	125*	µg/l	1	Grab	
Boron	NA	2,000	µg/l	1	Grab	
Bromacil	314-40-9	4.4	µg/l	1	Grab	2
Bromide	NA	2,000	µg/l	1	Grab	
Bromobenzene	108-86-1	5	µg/l	1	Grab	
Bromochloromethane	74-97-5	5	µg/l	1	Grab	
Bromodichloromethane	75-27-4	50	µg/l	1	Grab	
Bromoform	75-25-2	50	µg/l	1	Grab	
Bromomethane	74-83-9	5	µg/l	1	Grab	
Butachlor	23184-66-9	3.5	µg/l	1	Grab	
n-Butanol	71-36-3	50	µg/l	1	Grab	
cis-2-Butenal	15798-64-8	5	µg/l	1	Grab	
trans-2-Butenal	123-73-9	5	µg/l	1	Grab	
cis-2-Butenenitrile	1190-76-7	5	µg/l	1	Grab	
trans-2-Butenenitrile	627-26-9	5	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
				Measurement Frequency	Sample Type	
Outfall 001 – Containerized Well Development Water and/or Pump Test Water						
Butoxyethoxyethanol	112-34-5	50	µg/l	1	Grab	
Butoxypropanol	5131-66-8	50	µg/l	1	Grab	
Butylate	2008-41-5	50	µg/l	1	Grab	
n-Butylbenzene	104-51-8	5	µg/l	1	Grab	
sec-Butylbenzene	135-98-8	5	µg/l	1	Grab	
Tert-Butylbenzene	98-06-6	5	µg/l	1	Grab	
Butyl benzyl phthalate	85-68-7	50	µg/l	1	Grab	
Butyl isopropyl phthalate	NA	50	µg/l	1	Grab	
Carbon disulfide	75-15-0	60	µg/l	1	Grab	
Cadmium	NA	10	µg/l	1	Grab	
Captan	133-06-2	18	µg/l	1	Grab	
Carbaryl	63-25-2	29	µg/l	1	Grab	
Carbofuran	1563-66-2	15	µg/l	1	Grab	
Carbon tetrachloride	56-23-5	5	µg/l	1	Grab	
Carboxin	5234-68-4	50	µg/l	1	Grab	
Chloramben *includes realted forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid.	NA	50*	µg/l	1	Grab	
Chloranil	118-75-2	5	µg/l	1	Grab	
Chlordane	57-74-9	0.05	µg/l	1	Grab	
Chloride	NA	500,000	µg/l	1	Grab	
Chlorinated dibenzo-p-dioxins and Chlorinated dibenzofurans	NA	7x10 ⁻⁷	µg/l	1	Grab	
2-Chloroaniline	95-51-2	5	µg/l	1	Grab	
3- Chloroaniline	108-42-9	5	µg/l	1	Grab	
4- Chloroaniline	106-7-8	5	µg/l	1	Grab	
Chlorobenzene	108-90-7	5	µg/l	1	Grab	
4-Chlorobenzotrifluoride	98-56-6	5	µg/l	1	Grab	
1-Chlorobutane	109-69-3	5	µg/l	1	Grab	
Chloroethane	75-00-3	5	µg/l	1	Grab	
Chloroform	67-66-3	7	µg/l	1	Grab	
Chloromethyl methyl ether	107-30-2	5	µg/l	1	Grab	
2-Chloronaphthalene	91-58-7	10	µg/l	1	Grab	
2-Chloronitrobenzene	88-73-3	5	µg/l	1	Grab	
3-Chloronitrobenzene	121-73-3	5	µg/l	1	Grab	
4-Chloronitrobenzene	100-00-5	5	µg/l	1	Grab	
Chloroprene	126-99-8	5	µg/l	1	Grab	
Chlorothalonil	1897-45-6	5	µg/l	1	Grab	
2-Chlorotoluene	95-49-8	5	µg/l	1	Grab	
3-Chlorotoluene	108-41-8	5	µg/l	1	Grab	
4-Chlorotoluene	106-43-4	5	µg/l	1	Grab	
4-Chloro-o-toluidine	95-69-2	5	µg/l	1	Grab	
5-Chloro-o-toluidine	95-79-4	5	µg/l	1	Grab	
3-Chloro-1,1,1-trifluoropropane	460-35-5	5	µg/l	1	Grab	
Chromium	NA	100	µg/l	1	Grab	
Chromium (hexavalent)	NA	100	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement Frequency	Sample Type	
Chrysene	218-01-9	0.002	µg/l	1	Grab	2
Copper	NA	1000	µg/l	1	Grab	
Cyanide	NA	400	µg/l	1	Grab	
Cyanogen bromide	506-68-3	5	µg/l	1	Grab	
Cyanogen chloride	506-77-4	5	µg/l	1	Grab	
Dalapon *Includes related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid.	NA	50*	µg/l	1	Grab	
p,p’-DDD	72-54-8	0.3	µg/l	1	Grab	
p,p’-DDE	72-55-9	0.2	µg/l	1	Grab	
p,p’-DDT	50-29-3	0.2	µg/l	1	Grab	
Dechlorane Plus	13560-89-9	5	µg/l	1	Grab	
Diazinon	333-41-5	0.7	µg/l	1	Grab	
1,2-Dibromobenzene	583-53-9	5	µg/l	1	Grab	
1,3-Dibromobenzene	108-36-1	5	µg/l	1	Grab	
1,4-Dibromobenzene	106-37-6	5	µg/l	1	Grab	
Dibromochloromethane	124-48-1	50	µg/l	1	Grab	
1,2-Dibromo-3-chloropropane	96-12-8	0.04	µg/l	1	Grab	
Dibromodichloromethane	594-18-3	5	µg/l	1	Grab	
Dibromomethane	74-95-3	5	µg/l	1	Grab	
2,2-Dibromo-3-nitrilopropionamide	10222-01-2	50	µg/l	1	Grab	
Di-n-butyl phthalate	84-74-2	50	µg/l	1	Grab	
Dicamba	1918-00-9	0.44	µg/l	1	Grab	
Dichlorobenzenes *applies to each dichlorobenzene individually	95-50-1; 541-73-1; 106-47-6	3*	µg/l	1	Grab	
3,3’-Dichlorobenzidine	91-94-1	5	µg/l	1	Grab	
3,4-Dichlorobenzotriflouiride	328-84-7	5	µg/l	1	Grab	
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/l	1	Grab	
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/l	1	Grab	
Dichlorodifluoromethane	75-71-8	5	µg/l	1	Grab	
1,1-Dichloroethane	75-34-3	5	µg/l	1	Grab	
1,2-Dichloroethane	107-06-2	0.6	µg/l	1	Grab	
1,1-Dichloroethene	75-35-4	5	µg/l	1	Grab	
cis-1,2-Dichloroethene	156-59-2	5	µg/l	1	Grab	
Trans-1,2-Dichloroethene	156-60-5	5	µg/l	1	Grab	
Dichloroflouromethane	75-43-4	5	µg/l	1	Grab	
2,4-Dichlorophenol *see limit for Phenolic compounds (total phenols)	120-83-2	*	µg/l	1	Grab	
2,4-Dichlorophenoxyacetic acid	94-75-7	50	µg/l	1	Grab	
1,1-Dichloropropane	78-99-9	5	µg/l	1	Grab	
1,2-Dichloropropane	78-87-5	1	µg/l	1	Grab	
1,3-Dichloropropane	142-28-9	5	µg/l	1	Grab	
2,2-Dichloropropane	594-20-7	5	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
				Measurement Frequency	Sample Type	
Outfall 001 – Containerized Well Development Water and/or Pump Test Water						
1,1-Dichloropropene	563-58-6	5	µg/l	1	Grab	
cis 1,3-Dichloropropene *applies to sum of cis- and trans- 1,3-Dichloropropene	10061-01-5	0.4*	µg/l	1	Grab	2
trans 1,3-Dichloropropene *applies to sum of cis- and trans- 1,3-Dichloropropene	10061-02-6	0.4*	µg/l	1	Grab	2
2,3-Dichlorotoluene	32768-54-0	5	µg/l	1	Grab	
2,4-Dichlorotoluene	95-73-8	5	µg/l	1	Grab	
2,5-Dichlorotoluene	19398-61-9	5	µg/l	1	Grab	
2,6-Dichlorotoluene	118-69-4	5	µg/l	1	Grab	
3,4-Dichlorotoluene	95-75-0	5	µg/l	1	Grab	
3,5-Dichlorotoluene	25186-47-4	5	µg/l	1	Grab	
Dieldrin	60-57-1	0.004	µg/l	1	Grab	2
Di(2-ethylhexyl)adipate	103-23-1	20	µg/l	1	Grab	
Diethyl phthalate	84-66-2	50	µg/l	1	Grab	
1,2-Diflouro-1,1,2,2-tetrachloroethane	76-12-0	5	µg/l	1	Grab	
1,2-Diisopropylbenzene	577-55-9	5	µg/l	1	Grab	
1,3-Diisopropylbenzene	99-62-7	5	µg/l	1	Grab	
1,4-Diisopropylbenzene	100-18-5	5	µg/l	1	Grab	
N,N-Dimethylaniline	121-69-7	1	µg/l	1	Grab	
2,3-Dimethylaniline	87-59-2	5	µg/l	1	Grab	
2,4-Dimethylaniline	95-68-1	5	µg/l	1	Grab	
2,5-Dimethylaniline	95-78-3	5	µg/l	1	Grab	
2,6-Dimethylaniline	87-62-7	5	µg/l	1	Grab	
3,4-Dimethylaniline	95-64-7	5	µg/l	1	Grab	
3,5-Dimethylaniline	108-69-0	5	µg/l	1	Grab	
3,3'-Dimethylbenzidine	119-93-7	5	µg/l	1	Grab	
4,4'-Dimethylbibemzyl	538-39-6	5	µg/l	1	Grab	
4,4'-Dimethyldiphenylmethane	4957-14-6	5	µg/l	1	Grab	
Dimethylformamide	68-12-2	50	µg/l	1	Grab	
alpha, alpha-Dimethyl phenethylanime	122-09-8	5	µg/l	1	Grab	
2,4-Dimethylphenol *see limit for Phenolic compounds (total phenols)	105-67-9	*	µg/l	1	Grab	
Dimethyl phthalate	131-11-3	50	µg/l	1	Grab	
2,4-Dinitrophenol *see limit for Phenolic compounds (total phenols)	51-28-5	*	µg/l	1	Grab	
Dimethyl tetrachloroterephthalate	1861-32-1	50	µg/l	1	Grab	
1,3-Dinitrobenzene	99-65-0	5	µg/l	1	Grab	
2,3-Dinitrotoluene	602-01-7	5	µg/l	1	Grab	
2,4-Dinitrololuene	121-14-2	5	µg/l	1	Grab	
2,5-Dinitrololuene	619-15-8	5	µg/l	1	Grab	
2,6-Dinitrololuene	606-20-2	5	µg/l	1	Grab	
3,4-Dinitrololuene	610-39-9	5	µg/l	1	Grab	
3,5-Dinitrololuene	618-85-9	5	µg/l	1	Grab	
Di-n-octyl phthalate	117-84-0	50	µg/l	1	Grab	
Dinoseb *see limit for Phenolic compounds (total phenols)	88-85-7	*	µg/l	1	Grab	
Diphenamid	957-51-7	50	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement Frequency	Sample Type	
Diphenylamine	122-39-4	5	µg/l	1	Grab	
1,1-Diphenylhydrazine	530-50-7	ND	µg/l	1	Grab	3
1,2-Diphenylhydrazine	122-66-7	ND	µg/l	1	Grab	3
Diquat	2764-72-9	20	µg/l	1	Grab	
Disulfoton *Refer to entry for “Phorate and Disulfoton”	298-04-4	ND	µg/l	1	Grab	3
Dodecylguanidine acetate and Dodecylguanidine hydrochloride *applies to the sum of these substances	2439-10-3; 13590-97-1	50*	µg/l	1	Grab	
Dyphylline	479-18-5	50	µg/l	1	Grab	
Endothall	145-73-3	50	µg/l	1	Grab	
Endrin	72-20-8	ND	µg/l	1	Grab	3
Endrin aldehyde	7421-93-4	5	µg/l	1	Grab	
Endrin ketone	53494-70-5	5	µg/l	1	Grab	
Ethylbenzene	100-41-4	5	µg/l	1	Grab	
Ethylene chlorohydrin	107-07-3	50	µg/l	1	Grab	
Ethylene dibromide	106-93-4	6 x 10 ⁻⁴	µg/l	1	Grab	
Ethylene glycol	107-21-1	50	µg/l	1	Grab	
Ethylene oxide	75-21-8	0.05	µg/l	1	Grab	
Ethylenethiourea	96-45-7	ND	µg/l	1	Grab	3
Ferbam	14484-64-1	4.2	µg/l	1	Grab	
Fluometuron	2164-17-2	50	µg/l	1	Grab	
Fluoranthene	206-44-0	50	µg/l	1	Grab	
Fluorene	86-73-7	50	µg/l	1	Grab	
Fluoride	NA	3000	µg/l	1	Grab	
Formaldehyde	50-00-0	8	µg/l	1	Grab	
Folpet	133-07-3	50	µg/l	1	Grab	
Glyphosate	1071-83-6	50	µg/l	1	Grab	
Guaifenesin	93-14-1	50	µg/l	1	Grab	
Heptachlor	76-44-8	0.04	µg/l	1	Grab	
Heptachlor epoxide	1024-57-3	0.03	µg/l	1	Grab	
Hexachlorobenzene	118-74-1	0.04	µg/l	1	Grab	
Hexachlorobutadiene	87-68-3	0.5	µg/l	1	Grab	
alpha-Hexachlorocyclohexane	319-84-6	0.01	µg/l	1	Grab	
beta-Hexachlorocyclohexane	319-85-7	0.04	µg/l	1	Grab	
delta-Hexachlorocyclohexane	319-86-8	0.04	µg/l	1	Grab	
epsilon-Hexachlorohexane	6108-10-7	0.04	µg/l	1	Grab	
gamma-Hexachlorohexane	58-89-9	0.05	µg/l	1	Grab	
Hexachloropentadiene	77-47-4	5	µg/l	1	Grab	
Hexachloroethane	67-72-1	5	µg/l	1	Grab	
Hexachlorophene *see limit for Phenolic compounds (total phenols)	70-30-4	*	µg/l	1	Grab	
Hexachloropropene	1888-71-7	5	µg/l	1	Grab	
2-Hexanone	591-78-6	50	µg/l	1	Grab	
Hexazinone	51235-04-2	50	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
				Measurement Frequency	Sample Type	
Outfall 001 – Containerized Well Development Water and/or Pump Test Water						
Hydrogen sulfide *see limit for Sulfides, total	7783-04-2	*	µg/l	1	Grab	
Hydroquinone *see limit for Phenolic compounds (total phenols)	123-31-9	*	µg/l	1	Grab	
1-Hydroxyethylidene-1,1-diphosphonic acid	2809-21-4	50	µg/l	1	Grab	
2-(2-Hydroxy-3,5-di-tert-pentylphenyl)-benzotriazole *see limit for Phenolic compounds (total phenols)	25	*	µg/l	1	Grab	
Indeno(1,2,3-cd)pyrene	193-39-5	0.002	µg/l	1	Grab	2
Iron *Also see Iron and Manganese	NA	600*	µg/l	1	Grab	
Iron and Manganese *Applies to the sum of these substances	NA	1000*	µg/l	1	Grab	
Isodrin	465-73-6	5	µg/l	1	Grab	
Isophorone	78-59-1	50	µg/l	1	Grab	
Isopropalin	33820-53-0	5	µg/l	1	Grab	
Isopropylbenzene	98-82-8	5	µg/l	1	Grab	
2-Isopropyltoluene	527-84-4	5	µg/l	1	Grab	
3-Isopropyltoluene	535-77-3	5	µg/l	1	Grab	
4-Isopropyltoluene	99-87-6	5	µg/l	1	Grab	
Kepone	143-50-0	ND	µg/l	1	Grab	3
Lead	NA	50	µg/l	1	Grab	
Magnesium	NA	35,000	µg/l	1	Grab	
Malathion	121-75-5	7	µg/l	1	Grab	
Mancozeb	8018-01-7	1.8	µg/l	1	Grab	2
Maneb	12427-38-2	1.8	µg/l	1	Grab	2
Manganese *Also see 'Iron and Manganese'	NA	600*	µg/l	1	Grab	
Mercaptobenzothiazole	149-30-4	50	µg/l	1	Grab	
Mercury	NA	1.4	µg/l	1	Grab	
Methacrylic acid	79-41-4	50	µg/l	1	Grab	
Methacrylonitrile	126-98-7	5	µg/l	1	Grab	
Methomyl *see limit for "Aldicarb and Methomyl"	16752-77-5	*	µg/l	1	Grab	
Methoxychlor	72-43-5	35	µg/l	1	Grab	
(1-Methoxyethyl) benzene	4013-34-7	50	µg/l	1	Grab	
(2-Methoxyethyl) benzene	3558-60-6	50	µg/l	1	Grab	
N-Methylaniline	100-61-8	5	µg/l	1	Grab	
Methylbenz(a)anthracenes *applies to the sum of these substances	NA	0.002*	µg/l	1	Grab	
Methyl chloride	74-87-3	5	µg/l	1	Grab	
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	0.44	µg/l	1	Grab	2
4,4'-Methylene-bis-(2-chloroaniline)	101-14-4	5	µg/l	1	Grab	
4,4'-Methylene-bis-(N-methyl)aniline	1807-55-2	5	µg/l	1	Grab	
4,4'-Methylene-bis-(N,N'-dimethyl) aniline	101-61-1	5	µg/l	1	Grab	
Methylene bithiocyanate	6317-18-6	50	µg/l	1	Grab	
Methylene chloride	75-09-2	5	µg/l	1	Grab	
4-(1-Methylethoxy)-1-butanol	31600-69-8	50	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement	Sample Type	
				Frequency		
2-Methylethyl-1,3-dioxolane	126-39-6	50	µg/l	1	Grab	
Methyl ethyl ketone	78-93-3	50	µg/l	1	Grab	
Methyl iodide	74-88-4	5	µg/l	1	Grab	
Methyl methacrylate	80-62-6	50	µg/l	1	Grab	
Methyl parathion *see limit for ‘Parathion and Methyl parathion’	298-00-0	*	µg/l	1	Grab	
alpha-Methylstyrene	98-83-9	5	µg/l	1	Grab	
2-Methylstyrene	611-15-4	5	µg/l	1	Grab	
3-Methylstyrene	100-80-1	5	µg/l	1	Grab	
4-Methylstyrene	622-97-9	5	µg/l	1	Grab	
Methyl tert-butyl ether (MTBE)	1634-04-4	10	µg/l	1	Grab	
Metolachlor ESA	171118-09-5	50	µg/l	1	Grab	
Metolachlor OA	152019-73-3	50	µg/l	1	Grab	
Metribuzin	21087-64-9	50	µg/l	1	Grab	
Mirex	2385-85-5	0.03	µg/l	1	Grab	2
Nabam	142-59-6	1.8	µg/l	1	Grab	2
Naphthalene	91-20-3	10	µg/l	1	Grab	
Niacinamide	98-92-0	500	µg/l	1	Grab	
Nickel	NA	200	µg/l	1	Grab	
Nitralin	4726-14-1	35	µg/l	1	Grab	
Nitrate	NA	20,000	µg/l	1	Grab	
Nitrate and Nitrite (as N)	NA	20,000	µg/l	1	Grab	
Nitrilotriacetic acid *includes related forms that convert to nitrilotriacetic acid upon acidification to a pH of 2.3 or less	NA	3*	µg/l	1	Grab	
Nitrite (as N)	NA	2,000	µg/l	1	Grab	
2-Nitroaniline	88-74-4	5	µg/l	1	Grab	
3-Nitroaniline	99-09-2	5	µg/l	1	Grab	
4-Nitroaniline	100-01-6	5	µg/l	1	Grab	
Nitrobenzene	98-95-3	0.4	µg/l	1	Grab	
N-Nitrosodiphenylamine	86-30-6	50	µg/l	1	Grab	
2-Nitrotoluene	88-72-2	5	µg/l	1	Grab	
3-Nitrotoluene	99-08-1	5	µg/l	1	Grab	
4-Nitrotoluene	99-99-0	5	µg/l	1	Grab	
5-Nitro-o-toluidine	99-55-8	5	µg/l	1	Grab	
Octachlorostyrene	29082-74-4	0.2	µg/l	1	Grab	
Organic substances, total	NA	100	µg/l	1	Grab	
Oxamyl	23135-22-0	50	µg/l	1	Grab	
Paraquat	4685-14-7	3.0	µg/l	1	Grab	
Parathion *see limit for ‘Parathion and Methyl parathion’	56-38-2	*	µg/l	1	Grab	
Parathion and Methyl parathion *Applies to the sum of these substances	5638-2; 298-00-0	1.5*	µg/l	1	Grab	
Pendimethalin	40487-42-1	5	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
				Measurement Frequency	Sample Type	
Outfall 001 – Containerized Well Development Water and/or Pump Test Water						
Pentachlorobenzene	608-93-5	5	µg/l	1	Grab	
Pentachloroethane	76-01-7	5	µg/l	1	Grab	
Pentachloronitrobenzene	82-68-8	ND	µg/l	1	Grab	3
Pentachlorophenol *see limit for ‘Phenolic compounds (total phenols)’	87-86-5	*	µg/l	1	Grab	
Phenanthrene	85-01-8	50	µg/l	1	Grab	
Phenol *see limit for ‘Phenolic compounds (total phenols)’	108-95-2	*	µg/l	1	Grab	
Phenolic compounds (total phenols) *Applies to the sum of these substances	NA	2*	µg/l	1	Grab	2,10
Phenols, total chlorinated *see limit for ‘Phenolic compounds (total phenols)’	NA	*	µg/l	1	Grab	
Phenols, total unchlorinated *see limit for ‘Phenolic compounds (total phenols)’	NA	*	µg/l	1	Grab	
1,2-Phenylenediamine	95-54-5	5	µg/l	1	Grab	
1,3-Phenylenediamine	108-45-2	5	µg/l	1	Grab	
1,4-Phenylenediamine	108-45-2	5	µg/l	1	Grab	
Phenyl ether	101-84-8	10	µg/l	1	Grab	
Phenylhydrazine	100-63-0	5	µg/l	1	Grab	
Phenylpropanolamine	14838-15-4	50	µg/l	1	Grab	
3-Phenyl-1-propene	637-50-3	5	µg/l	1	Grab	
cis-1-Phenyl-1-propene	766-90-5	5	µg/l	1	Grab	
trans-1-Phenyl-1-propene	873-66-5	5	µg/l	1	Grab	
Phorate	298-02-2	ND	µg/l	1	Grab	3
Picloram *includes related forms that convert to the organic acid upon acidification to a pH of 2 or less; and esters of the organic acid.	NA	50*	µg/l	1	Grab	
PCB-1016	12674-11-2	0.20	µg/l	1	Grab	2,5
PCB-1221	11104-28-2	0.20	µg/l	1	Grab	2,5
PCB-1232	11141-16-5	0.20	µg/l	1	Grab	2,5
PCB-1242	53469-21-9	0.20	µg/l	1	Grab	2,5
PCB-1248	12672-29-6	0.20	µg/l	1	Grab	2,5
PCB-1254	11097-69-1	0.20	µg/l	1	Grab	2,5
PCB-1260	11096-82-5	0.20	µg/l	1	Grab	2,5
Principal organic contaminant	NA	5	µg/l	1	Grab	4
Prometon	1610-18-0	50	µg/l	1	Grab	
Propachlor	1918-16-7	35	µg/l	1	Grab	
Propanil	709-98-8	7.0	µg/l	1	Grab	
Propazine	139-40-2	16	µg/l	1	Grab	
Propham	122-42-9	50	µg/l	1	Grab	
n-Propylbenzene	103-65-1	5	µg/l	1	Grab	
Propylene glycol	57-55-6	1000	µg/l	1	Grab	
Pyrene	129-00-0	50	µg/l	1	Grab	
Pyridine	110-86-1	50	µg/l	1	Grab	
Selenium	NA	20	µg/l	1	Grab	
Silver	NA	100	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement Frequency	Sample Type	
Simazine	122-34-9	0.5	µg/l	1	Grab	
Styrene	100-42-5	930	µg/l	1	Grab	
Sulfate	NA	500,000	µg/l	1	Grab	
Sulfide	NA	1,000	µg/l	1	Grab	
Tebuthiuron	34014-18-1	50	µg/l	1	Grab	
Terbacil	5902-51-2	50	µg/l	1	Grab	
Terbufos	13071-79-9	0.09	µg/l	1	Grab	
Tetrachlorobenzenes *value of 5 µg/l applies to each tetrachlorobenzene individually. Value of 10 µg/l applies to the sum of the substances.	636-66-2; 634-90-2; 95-94-3; 12408-10-5	*	µg/l	1	Grab	
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/l	1	Grab	
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/l	1	Grab	
Tetrachloroethene	127-18-4	5	µg/l	1	Grab	
Tetrachloroterephthalic acid	2136-79-0	50	µg/l	1	Grab	
alpha, alpha, alpha, 4-Tetrachlorotoluene	5216-25-1	5	µg/l	1	Grab	
Tetrahydrofuran	109-99-9	50	µg/l	1	Grab	
1,2,3,4-Tetramethylbenzene	488-23-3	5	µg/l	1	Grab	
1,2,3,5-Tetramethylbenzene	527-53-7	5	µg/l	1	Grab	
1,2,4,5-Tetramethylbenzene	95-93-2	5	µg/l	1	Grab	
Thallium	NA	0.5	µg/l	1	Grab	
Theophylline	58-55-9	40	µg/l	1	Grab	
Thiram	137-26-8	1.8	µg/l	1	Grab	
Toluene	108-88-3	5	µg/l	1	Grab	
Toluene-2,4-diamine	95-80-7	5	µg/l	1	Grab	
Toluene-2,5-diamine	95-70-5	5	µg/l	1	Grab	
Toluene-2,6-diamine	823-40-5	5	µg/l	1	Grab	
o-Toluidine	95-53-4	5	µg/l	1	Grab	
Tolytriazole	29385-43-1	50	µg/l	1	Grab	
Toxaphene	8001-35-2	0.06	µg/l	1	Grab	2
1,2,4-Tribromobenzene	615-54-3	5	µg/l	1	Grab	
Tributyltin oxide	56-35-9	50	µg/l	1	Grab	
2,4,6-Trichloroaniline	634-93-5	5	µg/l	1	Grab	
Trichlorobenzenes * value of 5 µg/l applies to each tetrachlorobenzene individually. Value of 10 µg/l applies to the sum of the substances.	87-61-6; 120-82-1; 108-70-3; 12002-48-1	*	µg/l	1	Grab	
1,1,1-Trichloroethane	71-55-6	5	µg/l	1	Grab	
1,1,2-Trichloroethane	79-00-5	1	µg/l	1	Grab	
Trichloroethene	79-01-6	5	µg/l	1	Grab	
Trichlorofluoromethane	75-69-4	5	µg/l	1	Grab	
2,4,5-Trichlorophenoxyacetic acid	93-76-5	35	µg/l	1	Grab	
2,4,5-Trichlorophenoxypropionic acid	93-72-1	0.26	µg/l	1	Grab	
1,1,2-Trichloropropane	598-77-6	5	µg/l	1	Grab	

Outfall and Parameters	CAS No.	Limitations Daily Max.	Units	Minimum Monitoring Requirements		FN
Outfall 001 – Containerized Well Development Water and/or Pump Test Water				Measurement Frequency	Sample Type	
1,2,3-Trichloropropane	96-18-4	0.04	µg/l	1	Grab	
cis-1,2,3-Trichloropropene	13116-57-9	5	µg/l	1	Grab	
trans-1,2,3-trichloropropene	13116-58-0	5	µg/l	1	Grab	
alpha,2,4-Trichlorotoluene	94-99-5	5	µg/l	1	Grab	
alpha,2,6-Trichlorotoluene	2014-83-7	5	µg/l	1	Grab	
alpha,3,4-Trichlorotoluene	102-47-6	5	µg/l	1	Grab	
alpha, alpha,2-Trichlorotoluene	88-66-4	5	µg/l	1	Grab	
alpha, alpha,4-Trichlorotoluene	13940-94-8	5	µg/l	1	Grab	
2,3,4-Trichlorotoluene	7359-72-0	5	µg/l	1	Grab	
2,3,5-Trichlorotoluene	56961-86-5	5	µg/l	1	Grab	
2,3,6-Trichlorotoluene	2077-46-5	5	µg/l	1	Grab	
2,4,5-Trichlorotoluene	6639-30-1	5	µg/l	1	Grab	
2,4,6-Trichlorotoluene	23749-65-7	5	µg/l	1	Grab	
1,1,1-Trichloro-2,2,2-trifluoethane	354-58-5	5	µg/l	1	Grab	
1,1,2-Trichloro-1,2,2-trifluoethane	76-13-1	5	µg/l	1	Grab	
Trifluralin	1582-09-8	35	µg/l	1	Grab	
1,2,3-Trimethylbenzene	526-73-8	5	µg/l	1	Grab	
1,2,4-Trimethylbenzene	95-63-6	5	µg/l	1	Grab	
1,3,5-Trimethylbenzene	108-67-8	5	µg/l	1	Grab	
2,3,6-Trimethylpyridine	1462-84-6	50	µg/l	1	Grab	
2,4,6-Trimethylpyridine	108-75-8	50	µg/l	1	Grab	
sym-Trinitrobenzene	99-35-4	5	µg/l	1	Grab	
2,3,4-Trinitrotoluene	602-29-9	5	µg/l	1	Grab	
2,3,6-Trinitrotoluene	18292-97-2	5	µg/l	1	Grab	
2,4,5-Trinitrotoluene	610-25-3	5	µg/l	1	Grab	
2,4,6-Trinitrotoluene	118-96-7	5	µg/l	1	Grab	
3,4,5-Trinitrotoluene	603-15-6	5	µg/l	1	Grab	
Triphenyl phosphate	115-86-6	50	µg/l	1	Grab	
Uranyl ion	NA	10,000	µg/l	1	Grab	
Vinyl chloride	75-01-4	2	µg/l	1	Grab	
1,2-Xylene	95-47-6	5	µg/l	1	Grab	
1,3-Xylene	108-38-3	5	µg/l	1	Grab	
1,4-Xylene	106-42-3	5	µg/l	1	Grab	
Zinc	NA	5,000	µg/l	1	Grab	
Zineb	12122-67-7	1.8	µg/l	1	Grab	
Ziram	137-30-4	4.2	µg/l	1	Grab	

Footnotes:

1. Samples must be collected prior to each discharge event. Discharge may not commence until the sample results show compliance with the above discharge limitations.
2. Discharge limit is set at the Practical Quantitation Limit (PQL). Actual groundwater effluent standard/limitation is below this limit. The most stringent USEPA approved method must be used in the analysis of this parameter.
3. ND means non-detect. The most stringent USEPA approved method must be used in the analysis of this parameter.

4. Applies to any and every individual substance to which the ambient principal organic contaminant standard applies, except any substances that has an effluent standard or limitation value listed above. See Division of Water TOGS 1.1.1 for information on determining the applicability of the ambient POC standard to individual substances.
5. For PCBs:
 - a. The treatment plant operator must monitor this discharge for PCBs using USEPA laboratory method 608. The laboratory must make all reasonable attempts to achieve a Minimum Detection Level (MDL) of 0.065 µg/l.
 - b. 0.10 µg/l is the discharge goal. The treatment plant operator shall report all values above the MDL (0.065 µg/l per Aroclor). If the level of any Aroclor is above 0.10 µg/l, the treatment plant operator must evaluate the treatment system and identify the cause of the detectable level of PCBs in the discharge.
 - c. If the Department determines that effluent monitoring results above 0.10 µg/l can be prevented by implementation of additional measures as proposed by the treatment plant operator in footnote 5.b above, and approved by the Department, the treatment plant operator shall implement such additional measures.
6. Only waters generated at remediation sites during sampling, pump tests, well development, or dewatering of excavations, are authorized for treatment and discharge.
7. Samples and measurements, to comply with the monitoring requirements specified above, must be taken from the holding tank prior to discharge to groundwater.
8. Discharge may not occur unless the ground is capable of accepting the treated effluent. The discharge water may not be ponded on top of saturated or frozen ground or permitted to flow across the ground surface. Also, a minimum separation distance of 100 feet must be maintained between the discharge location and any surface waters (including wetlands).
9. Discharge is not authorized until such time as an engineering submission showing the method of treatment and discharge is approved by the Department. The discharge rate may not exceed the effective treatment system or ground adsorptive capacity. All monitoring data, engineering submissions and modification requests must be submitted to the following DER contact person: _____.
10. Total phenolics must be analyzed using EPA Methods 420.1 or 420.2.

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Comment			Response
GENERAL COMMENTS			
1		The Remedial Design Report details the remedial actions with respect to the In-situ Thermal Treatment (ISTT) activities planned for the site. Will a separate Remedial Design Report be submitted for the In-situ Chemical Oxidant Injection (ISCO) component of the proposed remedy?	Yes, a separated Remedial Design Report will be submitted for the in situ chemical oxidant injection component of the proposed remedy.
2		A Health and Safety Plan (HASP) should be included along with the resubmission of this report	The HASP has been attached to this response document.
Report Section			REPORT COMMENTS
3	2.2.2 Hydrology	Section 2.2.2. discusses the potable supply wells for City of Jamestown. This section should be revised to incorporate the distance of the potable supply wells with respect to the site	The BPU supplies water to Jamestown from a network of wells more than 2 miles east of the site completed in the confined aquifers in the Cassadaga Creek and Conewango Creek drainages. Text has been added to the RD text reflecting this: "The City of Jamestown obtains its water from two well fields in this aquifer with artesian conditions located northeast of the city and more than 2 miles east of the site."
4	2.3 Nature and Extent of Contamination (Bullet 5)	Monitoring well MW-7DD was resampled in May 2023, please provide the results of this sample event	Resampling results were provided with the Focused Feasibility Study; for reference the last round of sampling detected cis 1,2-DCE at 150 ug/L, Acetone at 7.7 ug/L, TCE at 31 ug/L, Vinyl Chloride at 10 ug/L, 2-Butanone at 6 ug/L and 1,1-DCE at and estimated 0.30 ug/L
5	Section 3.1, Regulatory Framework	"This report assumes that NYSDEC will accept the RAOs proposed in the FFS." The NYSDEC has released the proposed Amendment to the Record of Decision (AROD) which details the proposed Remedial Action Objectives for the site. The text should be revised to be consistent with the AROD'	The text has been revised to reflect the release of the AROD: "NYSDEC released the proposed Amendment to the Record of Decision (AROD) on August 15, 2023 which details the proposed Remedial Action Objectives for the site."
6	Section 3.2, Target Treatment Zone Definition	Within Section 3.2 and throughout the Report the extent of the treatment zone is defined by subsurface sample locations displaying chlorinated volatile organic compound (CVOCs) concentrations exceeding 25 milligrams per kilogram. The protection of groundwater soil cleanup objectives (PGW SCOs) are applicable to the contaminants of concern that are impacting groundwater at this site. The Report should be revised to indicate that the PGW SCOs are applicable at this site and the treatment should be designed to address on-site exceedances of PGW SCOs. If areas exceeding PGW SCOs are not proposed for treatment it needs to be clearly explained why it is not feasible to do so	A mass removal target of 25 mg/kg or greater was chosen as a technically and economically feasible objective for the thermal treatment system, that is consistent with the Remediation Objectives described in Section 3.3.2 of the design: 1. Treatment of the source area using ISTT has reached an asymptotic rate of contaminant recovery. 2. Additional input of subsurface energy will not measurably increase contaminant removal rate. 3. Continued operation of the ISTT system offers no further reduction in COC mobility, or potential for contaminant migration from the TTZ. The system is intended to remove the large majority of constituent mass in the subsurface and treat concentrations greater than 25 mg/kg, but will likely reach an asymptotic removal condition prior to achieving the SCOs. The FFS that was reviewed by NYSDEC outlined the treatment target of 25 mg/kg or greater in Figures 4-3 and 4-4 for Alternatives 3 and 4 respectively, and included a discussion on why this target was chosen instead of the SCOs. The 25 mg/kg target boundary was also incorporated by NYSDEC into the AROD and was shown on figures presented during public consultations on September 7, 2023. Based on these, Jacobs had understood the treatment target of 25 mg/kg had been accepted by NYSDEC.

NYSDEC Comments on ISTT Design Received September 12, 2023- Jacobs Responses October 4, 2023

		Comment	Response
7	Section 3.3.2, ISTT Remediation Objectives	Section 3.3.3. states that the operation of the system may be discontinued at Dow's discretion. Prior to system shut down, a request that provides supporting rationale to shut down the system must be submitted to the NYSDEC for review and approval. This section and any additional reference to this statement should be revised throughout the report	The performance objectives for the system, and metrics to assess the achievement of the performance objectives, were outlined in Section 3.3 of the design document. Besides overall contaminant mass recovery rate, analytical soil sample results collected as discussed in Section 5.1.2, and total VOC concentration in vapor samples collected at individual extraction wells measured with a real-time instrument will be utilized in determining if additional significant mass reduction is feasible. The objective of achieving asymptotic mass removal conditions will be the primary driver behind the decision to shut down the system. Asymptotic mass recovery may include a potentially significant contaminant mass contribution across the OU-01 boundary from the downgradient OU-03 area. Mass on the OU-01/OU-03 boundary will be influenced by the pressure differential between the TTZ and OU-3, resulting in an inward gradient of COC flux into the TTZ which will be recovered by the ISTT system. While this mass flux will not be significant enough to progress OU-03 towards the SCOs, it will result in a non-zero asymptotic mass recovery rate. Once this asymptotic mass removal has been achieved, and it has been determined that further operation of the system will not significantly reduce the constituent mass in the TTZ, continued operation will incur substantial ongoing costs per day for electricity, water, and other operational costs. Shut-down decision making therefore needs to be made in a timely fashion based on the data collected, and requiring NYSDEC shutdown approval would incur delays and significant costs. In the interest of cooperation, Jacobs, Dow and Mc2 propose to set-up a conference call when this decision point is approaching but asks that a real-time decision be made during the call.
8a	Section 4.2, ISTT System Design	a. Additional information should be provided to describe the installation of the 4 angled extraction wells displayed on Figure WFL-01;	The wells will be installed using a sonic drill rig. The rig is capable of tilting its mast to the prescribed angle of 43 degrees so that the well may be installed at an angle. Details are shown on drawing WCD-02 in Appendix B.
8b	Section 4.2, ISTT System Design	b. Bullet 7: Within the text please provide clarification on the treatment system that will be utilized during the implementation of the ISTT remedy;	Discussion of the treatment system has been added as Section 4.3. Proposed text is attached.
9a	Section 4.3, Permitting and Regulatory Compliance	a. The text should be revised to incorporate a description of the alarm/notification system;	A bullet has been added referencing required alarm equipment in Section 4.4 : "•The system will incorporate notifications and alarms described in Section 5.1. Additionally, required alarms and notification equipment listed in 6 NYCRR 373-3.3(c) will be present at the site, as described in the hazardous waste contingency plan." A discussion of the alarm system has been added to Section 5.1 of the design report: "The ISTT will incorporate an alarm system. Yellow alarm and red alarm conditions will both be programmed based on instrumentation readings and will result in partial or full shut-down of the system, respectively. Alarm notifications will be sent to the project control monitors and automatically to system operators by call-out, email or text message. Operators will be able to respond to alarms immediately during business hours, or within an hour during non-business hours."
9b	Section 4.3, Permitting and Regulatory Compliance	b. Bullet 20: For clarity, the specific RCRA regulations should be referenced;	The site will be a large quantity generator of hazardous waste during the work and those requirements will be met. Section 4.4 (formerly 4.3) of the text has been revised to add a citation for 6 NYCRR 372.2.
10	Section 4.3.2, Air Emissions	The NYSDEC Division of Air has been provided a draft copy of the Remedial Design Report for their review. Please note, additional comments with respect to air emissions may be forthcoming	Acknowledged that additional comments with respect to air emissions may be forthcoming. Jacobs performed outreach to the Division of Air who confirmed a permit is not necessary for operations; the letter was provided in the design submittal and is attached for ease of reference.
11	Section 4.3.3, Underground Injection Control	Please provided clarification on the discharge of effluent water from the treatment system. This section states that treated water may be reinjection into the subsurface while Section 4.3.4 along with the Jamestown Industrial Wastewater Discharge Permit indicate discharge to public utilities. Please note, any ground surface discharges are subject to the short-term discharge memorandum (attached for reference) or a State Pollutant Discharge Elimination System (SPDES) requirement	Treated groundwater will be discharged to the POTW under the existing Jamestown Industrial Discharge Permit and a portion may be used for reinjection to keep the electrodes moist. There will be no ground surface discharges.
12a	Section 4.4, Site Preparation	a. With respect monitoring wells planned for abandonment. Are there any concerns with regard to polyvinyl chloride melting? Specifically, will melting induce further contaminant migration, the release of additional volatiles, and what impact will this have on the treatment system?;	Based on past project experience, there is no risk that PVC wells could release PVC into the subsurface. The grouting procedures will negate potential concerns of volatile migration.

NYSDEC Comments on ISTT Design Received September 12, 2023- Jacobs Responses October 4, 2023

Comment			Response
12b	Section 4.4, Site Preparation	b. Please include a figure to support Table 4-2. The Figure should display the monitoring wells that will be decommissioned at the site. Following the completion of the ISTT remedy select monitoring wells will require replacement	A figure has been developed to graphically depict the monitoring wells that will be abandoned to advance the ISTT remedy. Please note that Table 1 and the new figure do not include RW-1D, RW-1S, RW-2D and RW-2S, which will not be abandoned at this time. They are constructed of stainless steel and will not be impacted by the ISTT system.
13	Section 4.5, Subsurface Construction	The construction of in-situ components will require the advancement of borings. The Report should discuss the management of an investigation derived wastes (IDW) generated during system construction;	All waste generated during drilling will be appropriately containerized, characterized and disposed of off-site in accordance with relevant regulations. The text will be revised to include a reference to Section 4.4.1 Waste Management.
14	Section 5, Remedy Operation	Table 5-1 provides a summary of the monitoring activities. A section should be included to further describe the monitoring frequencies within the text;	A summary of monitoring activities has been added to Section 5.1.2 that reflects the frequencies shown in Table 5-1. Monitoring frequencies were selected to allow tracking of system trends and to identify any changes in the monitored parameters in a timely fashion to allow for adjustments in system operations.
15	Section 5.1.1.4, Pressure	If the subsurface pressure is inadequate, what measures will be taken to improve the systems capture and prevent the release of soil vapor	The operators would increase local vapor extraction rates by manually adjusting flow control valves. As a secondary action, the overall vacuum would be increased to improve vapor capture.
16a	Section 5.1.2, Performance Monitoring and System Shutdown	a. It is not clear how monitoring for potential exposure via escaped vapor through preferential pathways (street drains, grates, building cracks, perforations in pavement, etc.) will be conducted. This should be described in Section 5.1.2. Please include additional information to detail the proactive/preventative measures beyond the soil vapor extraction system. If any component of the SVE is disrupted or compromised, untreated vapor may escape to	A walk-about of the Site with a PID will be part of the daily operation of the system. A check of the extraction wells with a handheld PID will be completed on a monthly basis which would indicate if a release of vapor has occurred. Shallow multi-phase extraction wells include extraction screens above the treatment zone in the vadose zone to capture any vapors escaping the TTZ. The system includes dual extraction blowers as shown on PFD-01 in Appendix B to maintain capture in the event of a partial failure. No odor will be observed during system operations.
16b	Section 5.1.2, Performance Monitoring and System Shutdown	b. Post remedial performance monitoring is discussed within this Report. A work plan detailing the post remedial performance monitoring plan (including any subsurface soil sampling) should be submitted to the NYSDEC and NYSDOH for review and approval;	A work plan detailing the post-remedial performance monitoring will be submitted under a separate cover at a later date. A conceptual plan was provided in the FFS but will be further detailed in the post-remedial performance monitoring plan.
17	Section 5.2, Post-Thermal Treatment Sampling	Post remedial monitoring may require follow-up sampling of additional medias including subsurface soils, groundwater, and soil vapor to evaluate the site conditions and the potential for contaminant rebound	The Focused Feasibility Solutions (FFS) document included a post-remedy groundwater monitoring program which will be carried out following the completion of the remedy. Soil sampling is intended to be performed near the end of operations; however, the criteria mentioned in Section 3.2 of the design will drive shutdown decisions.
18a	Figure WFL-1, IST Well Field Layout	a. Based on Figure WFL-1, it is not clear if the proposed extraction wells will extract both groundwater and soil vapor. Please provide clarification in the notes and/or legend sections of Figure WFL-1;	The proposed extraction wells are multi-phase utilizing vacuum extraction to extract vapors and compressed air lift assisted groundwater extracted via drop-tubes extending to the bottom of the extraction wells.
18b	Figure WFL-1, IST Well Field Layout	b. There are 10 proposed 'vacuum monitoring wells'. Based on the scale provided in this figure, it is not clear if this is a sufficient number of wells/points are proposed to determine the extent of the pressure field and if vapor may be moving offsite; and	The number and layout of the vacuum wells has been deemed sufficient based on past project experience with these systems. The system has a robust design to ensure continuous vapor capture, at a rate of 10 pore volumes per day in the vadose zone.
19		It is not clear if a Community Air Monitoring Plan (CAMP) will be implemented during the entire 180 days of ISTT. Please provide more detail to the CAMP as it relates to the ISTT installation and operation.	The CAMP applies, "...during intrusive activities, remedial actions or on-site treatment actions undertaken during the investigation and/or remediation of the site, including site management ..."where exposure to vapors could occur. The CAMP will be implemented during all intrusive construction and during all intrusive activities performed during system operation (e.g. soil sampling). Once system shakedown is complete and system operations have normalized daily system checks, including daily walkabouts with a PID, will be performed to verify that the system is operating as designed. During continued operation, the daily system checks would indicate if a failure of the control systems occurred and workers or the public could potentially be exposed to vapors. At that time, the CAMP would be implemented until the system is functioning properly



**The Dow Program
Jamestown Essex/Hope Site Operations
In-Situ Thermal Treatment System Construction and Operation
Project Health, Safety and Environment Plan**

Jamestown, NY

Version 1

September 2023

The Dow Chemical Company



Approvals

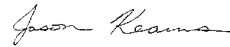
This Project Health, Safety, and Environment Plan (PHSEP) has been written for use by Jacobs only. Jacobs claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific project and site conditions and identified scope(s) of work and must be amended if those conditions or scope(s) of work change.

By approving this PHSEP, the Project Health and Safety Lead, or Project Health and Safety Manager (HSM) certifies that the personal protective equipment has been selected based on the task hazard/impact identification and risk assessment (HIIRA).

Author:

Jason Kearns

Project Health and Safety Manager Approval:



Project Manager Approval:

Chuck Ouelette

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Document history and status

Revision	Date	Description of Revisions	Author	Approved By/Title:
				Health and Safety Manager
				Project Manager

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Project Emergency Contacts

WorkCare 24-hour Injury Care – 1-888-449-7787

Medical Emergency—911 See local hospital information and route to hospital below.	Non-Emergency medical Injuries (no matter how minor) WorkCare: 1-888-449-7787 (call as soon as injury occurs)
Fire/Spill Emergency—911 Local Fire Department #: 716-483-7598 Security & Police—911 Local Police #: 716-483-7536	Utilities Emergency Phone Numbers 911
Jacobs Site Manager (SM) Name: Brian Carling Phone: 215.834.5397	Jacobs Dow Program HSE Manager Name: Jeanne Reilly Burgess Phone: 508-280-3653
Jacobs Project Manager (PM) Name: Chuck Ouelette Phone: 617.901.4859 Name: Garrett Hazebrouck Phone: 401.965.0126	Jacobs Project Health and Safety Manager (HSM) Name: Jason Kearns Phone: 304.610.6951
Jacobs Safety Liaison (SL) Name: Benjamin Hendry Phone: 315.806.4029 Name: Sawyer Fallin-Hornsberger Phone: 508.542.6975 Name: Max Newton Phone: 413.345.0024	Jacobs Project Environmental Manager (EM) Name: Hope Wilson Phone: 678.656.5411
Jacobs US Security Officer Name: Keith Waddell Phone: 214.920.8327	Jacobs Project Waste Manager (WM) Name: Branden Watts Phone: 304.561.4583
Automobile Accidents Rental: Vehicle Accident Form required to be sent to AutoClaims@jacobs.com (see Vehicle Accident Guidance attached to this plan) Fleet Vehicle: Karyna Zarate 281-721-8634	Media Inquiries Corporate Strategic Communications Name: Lorrie Paul Crum Phone: 469.941.8845 Human Resources Department Submit a request through Global People Services on Jacobs Connect Workman's Compensation Claims: WCClaims@jacobs.com
Facility/Site Alarms: None	Federal Express Dangerous Goods Shipping Phone: 800-238-5355

WorkCare 24-hour Injury Care – 1-888-449-7787**Jacobs Contact for Dangerous Goods Shipping**

Name/Phone: Chris Heckler/484-661-6494

CHEMTEL (hazardous material spills)

Phone: 800-255-3924

Facility/Site Evacuation Route(s):

In a severe emergency, such as a large fire, explosion, or large chemical release, site evacuation may become necessary. The SL/Operator will be responsible for informing site personnel of the anticipated routes of evacuation during the initial site training. If the situation permits, the SL/Operator will ensure that all combustion equipment has been shut down. The evacuation route and assembly area will depend upon the wind direction, topography, and the nature of the incident. Personnel will be advised to move to an upwind location at least 100 yards from any fires and/or releases and will be advised to continually monitor wind direction for changes.

If moving upwind is not possible without encountering the incident, personnel will be advised to move cross wind or downwind to a distance necessary to be out of the path of vapor releases, smoke, odors, or spills.

Once staff has evacuated to a safe distance, the SL/Operator will do the following:

- Contact emergency response personnel.
- Conduct a roll call to ensure all staff are accounted for.
- Ensure that emergency equipment and response personnel have adequate site access.
- All site personnel assembled at the designated safe evacuation area will wait for further instructions from emergency response personnel.

Evacuation Assembly Areas(s):

Parking lot of Hope Windows to the west and Jamestown Mattress Company to the east.

Directions and Map to Local Hospital

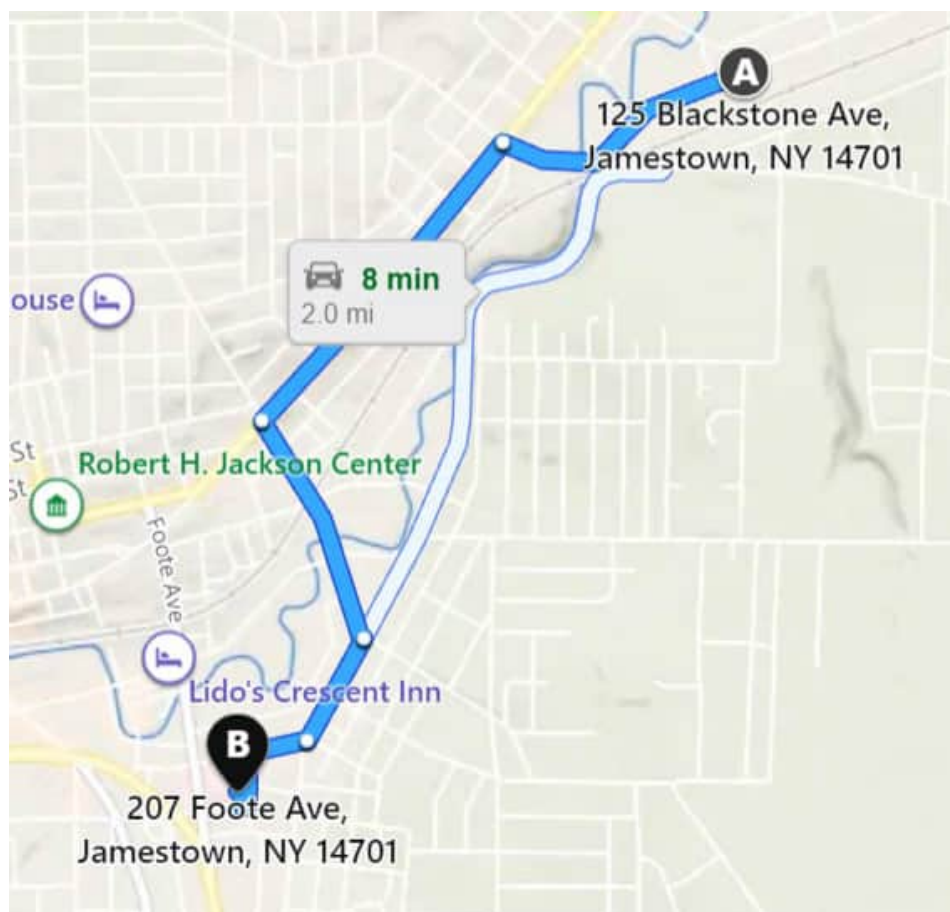
Local Hospital

UPMC Chautauqua Hospital
207 Foote Avenue
Jamestown, NY 14701
(716) 487-0141

Local Occupational Clinic (Consult with WorkCare prior to any clinic visit)

WorkCare: 1-888-449-7787 (call as soon as injury occurs)
UPMC Chautauqua Occupational Medicine
Jones Memorial Health Center
51 Glasgow Avenue
Jamestown, NY 14701
(716) 664-8165

1. Exit Site to LEFT and follow Hopkins Avenue to Red Light (0.2 miles)
2. Turn LEFT onto NY-394/East 2nd Street. Follow East 2nd Street to intersection with Foote Avenue (1.2 miles)
3. Turn LEFT onto Foote Avenue, Hospital on LEFT hand side (0.4 miles)



Applicability

This PHSEP applies to:

All Jacobs staff, including subcontractors and tiered subcontractors of Jacobs working on the site;

- All visitors to Jacobs construction or remediation sites in the custody of Jacobs (including, but not limited to, visitors from the Client, the Government, or the public,).
- In addition, subcontractors and tiered subcontractors shall also follow any of their company HSE programs, and site-specific PHSEPs and task hazard/impact identification and risk assessment (HIIRA) (e.g., activity or job hazard analyses). Even though this plan applies to non-Jacobs personnel as stated above, each employer is ultimately responsible for the health, safety, and well-being of their employees.

This PHSEP does not apply to the third-party contractors, their workers, their subcontractors, their visitors, or any other persons not under the direct control or custody of Jacobs.

The objective of this PHSEP is to ensure that project hazards and environmental impacts are eliminated or mitigated through the identification of hazards, environmental impacts assessment of risk and the application of effective control measures and to achieve a safe and healthy workplace for ourselves and subcontractor to whom we have a legal and moral duty of care. Further, there is a requirement to ensure that our activities are conducted in an environmentally friendly and responsible manner.

Jacobs has undertaken a structured hazard/impact identification and risk assessment process and shall implement a Safe System of Work (SSoW) for delivery of our services on this project. As part of the SSoW, this PHSEP defines the procedures and requirements for the health and safety of staff and visitors when they are physically on the work site. The work site includes the project area (as defined by the contract documents) and the project offices, trailers, and facilities thereon.

This PHSEP will be kept onsite during field activities and will be reviewed as necessary. The PHSEP will be reviewed at least annually and revised as project activities or conditions change or when supplemental information becomes available. The PHSEP adopts, by reference, the Jacobs Business Management System Global Health, Safety and Environment (HSE) and People and Places Solutions (P&PS) HSE Procedures and Work Instructions, as appropriate. In addition, applicable requirements contained in the Jacobs Federal and Environmental Services (F&ES) Field Handbook (Handbook) will be implemented. The Handbook is available as a stand-alone Handbook at the project site. The PHSEP may adopt procedures from the project Work Plan and any governing regulations. If there is a contradiction between this PHSEP and any governing regulation, the more stringent and protective requirement shall apply.

This PHSEP incorporates the regulatory requirements described in the State of California OSHA agency – Cal/OSHA Title 8 CCR, Section 3203, Injury and Illness Prevention Program (IIPP), and section 1509, Construction Injury and Illness Prevention Program and thus will be considered the respective program.

All staff and subcontractors must sign the employee sign-off form (Attached to this PHSEP) to acknowledge review of this document. Copies of the signature page will be maintained onsite by the Safety Liaison (SL).

1. General Project Information

1.1 Project Information and Background

Project Number: JMS018DW	Project/Site Name: Dow JMS
Client: Dow Chemical Company	Site Address: 125 Blackstone Avenue Jamestown, NY 14701
Date HSE Plan Prepared: 9/12/2023	Date(s) of Site Work: 10/3/2023

1.2 Site Description & Access

1.2.1 Site Description

The Essex/Hope Site is located on a 4.7 acre parcel of land that is currently owned and occupied by Custom Production Manufacturing, Inc. (CPM) at 125 Blackstone Avenue in the City of Jamestown, NY. The site is located in a highly industrialized area of the city that has seen various degrees of industrial use for the past 75 years. Contamination onsite is the result of historical practices conducted at the facility as discussed in the Remedial Investigation (RI) Report dated October 1992.

There are three separate areas that are the focus of remedial action and include the North Parking Lot (NPL) Area, the former Underground Storage Tanks (UST) Area, and the former Aboveground Storage Tank/Underground Storage Tank (AST/UST) Area.

- The remedial systems at the Essex/Hope Site were designed and constructed to address impacted groundwater and soils by a combination of soil vapor extraction, air sparging, and a groundwater extraction and treatment. The original remedial action design and implementation was based upon the March 1994 Record of Decision issued by the NYSDEC and included: A groundwater remediation system consisting of an extraction well network of five (5) shallow and two (2) deep recovery wells and activated carbon groundwater treatment with onsite discharge to the local POTW.
- Soil remediation in the AST/UST and UST Areas by soil vapor extraction (SVE) for volatile organic constituents occurring above the shallow water table.
- Soil excavation in the NPL Area, conducted in September and October of 1996, to remove impacted soils in the former sump and surrounding areas.
- Air sparging in the shallow water-bearing zone of the NPL, UST and AST/UST Areas to supplement the treatment of impacted groundwater via enhanced biodegradation and volatilization of organic constituents. A SVE system was added to the NPL Area to collect volatile organic constituents volatilized from the shallow groundwater in this area.
- The remedial areas were capped with either asphalt or concrete to enhance surface water runoff and minimize infiltration.
- A network of monitoring wells across the site (as designated in the Performance Monitoring Plan) is used to measure the effectiveness of the groundwater remedial activities.

1.2.2 Site Access/Badging Requirements

Employees being badged for the first time will be escorted by an experienced person.

1.2.3 Short Service Workers (SSW)

(Reference HSE Risk Implementation, JJ-HS-WI-0101-JJ-G)

A Short Service Worker (SSW) classification applies to engaging any workers, existing, new and contracted workers, with less than six months experience in the same job type, or with their present employer for any field project work. A New Site Worker (NSW) is a worker, regardless of work experience, has been at the site for less than 30 working days. SSW/NSW present elevated risks due to potential inexperience, unfamiliarity with the site, hazards or the duties required of them, unfamiliarity with Jacobs processes and practices, or reduced exposure to Jacobs' culture.

- 1) SSW/NSW must complete all HSE job qualifications, training and site/project chartering before commencing work.
- 2) SSW/NSW must be distinctively identifiable as SSW/NSW through e.g. the use of a hardhat with a different color, colored or marked Hi-Vis vest, or other suitable system appropriate to the work activity and work clothing for the task. Consider a system that is identifiable to all and not only reliant on color.

At this site, SSW are identified by wearing red sticker
NSW are identified by wearing yellow sticker

- 3) Conditions for project team composition with SSW include:
 - a) No SSW/NSW can work in the field alone
 - b) Teams of less than five can have no more than one SSW/NSW
 - c) Teams seeking more than 20% SSW/NSW require HSM approval
 - d) Variance to these criteria require HSM approval
 - e) Supervision must be assigned to SSW, and must be:
 1. Familiar with the SSW tasks, the supervisory responsibilities, and hazards with the work
 2. Familiar with HSE and project policies, procedures and any specialized actions for the work
 3. Able to recognize hazards and unsafe actions/conditions
 4. Able, willing and assertive in challenging workers who are not complying with site policy or requirements and enforcing the stop work authority
 5. An active participant in BeyondZero Observations

At the end of the established time period, the wearing of distinctive indicators is no longer required, providing that Supervision supports that the SSW/NSW understands HSE requirements and cultural expectations. Alternatively, the time period can be extended.

1.3 Description of Tasks

Below is a description of the tasks covered by this plan. Any additions or changes in scope will require a revision to this PHSEP; see Change Management below.

Scope of work covered by this PHSEP includes:

- Mobilization and Demobilization
- Utility Locate and Survey
- In Situ Thermal Treatment (ISTT) Installation / Operation & Monitoring / Decommissioning
- Confirmation Soil Sampling (Hot Soil Sampling)
- Waste Management

1.4 Change Management

Changes to this PHSEP shall be documented and approved by the HSM for the project. The following are examples of changes that may require a revision to the plan:

- Change in staff listed by name in this plan;
- New subcontractor to perform work;
- New chemicals brought to site for use;
- Change in scope or addition of new tasks;
- Change in contaminants of concern (COCs) or change in concentrations of COCs;
- New hazards or hazards not previously identified that are not addressed in this PHSEP; and
- New environmental impacts or environmental impacts not previously identified that are not addressed in this PHSEP.

1.5 Changes to Project Health, Safety and Environment Plans

Changes to the PHSEP shall be documented and accepted by using the Health and Safety Field Change Request (FCR) form) or by resubmitting a revised PHSEP for acceptance. A revised PHSEP should be produced when several changes using FCRs have been issued. The Project Manager (PM) and HSM shall be responsible for the review and acceptance of the FCR, and the HSM will maintain an FCR log of approved changes. FCRs are not required for safety-related changes that a Safety Liaison (SL) or HSM would normally make in the field, such as upgrade or downgrade to PPE within pre-established action levels, expansion or reduction of work control zones based on air monitoring results, and similar changes made within the operating parameters of the PHSEP. The field copy of the PHSEP shall be kept up to date by annotating the appropriate section to indicate that an FCR is in effect; copies of FCRs should be kept with the PHSEP. The FCR number must be referenced in the PHSEP and available for review.

2. Management of Subcontractors to Jacobs

The Project Manager subcontracting any field or site-based work activity will take reasonably practicable steps to ensure that our subcontractor is competent and able to carry out work safely before they start work. Specific details are listed in the HSE Field Handbook-Dow

2.1 Subcontractor HSE Chartering Meeting

(Reference P&PS Work Instruction, IB-HS-WI-0520, Health, Safety, and Environmental Requirements for Subcontractors)

A subcontractor HSE chartering meeting shall be held with subcontractors performing field work on the project. The purpose of the meeting is to discuss and agree on key HSE requirements on a project, and to emphasize and reinforce expectations for subcontractor HSE performance. The target audience includes key project staff with HSE responsibilities (e.g., PM, HSM, SL, EM FTL) and key subcontractor staff (e.g., project manager, supervisors, designated field HSE contact, drill team leads, foreman). The subcontractor crew members should attend if available. The meeting should be held prior to mobilization with enough time to ensure that HSE issues identified can be addressed prior to the start of work. The meeting can be held over the phone or in person depending on project needs. An example of an agenda is the "Site Work HSE Pre-Start Meeting Agenda".

3. Project HSE Objective Targets and Indicators

All project personnel and its visitors are to strive to meet the project specific HSE goals outlined in the HSE Field Handbook. Additional targets should be considered and defined for projects with a field component that are scheduled to last more than 12 months.

4. Dow Program Requirement

Dow Life Critical Standards (LCS) apply to Active and Legacy sites. Active sites, Dow implements the requirements. At legacy sites, they are incorporated into Jacobs management system.

4.1 Legacy Site Requirements

- All tasks at Dow legacy sites (those sites where Dow no longer has active operations nor staff presence) will be covered under:
 - Jacobs Dow Program Procedure Use Policy (PUP)
 - Jacobs Dow Program Safe Work Permit (SWP) Standard
 - The Exempt Task List (AHAs or HIRA, PTSP or POWRA and STAC will still apply).

Additional information is available in the HSE Field Handbook-Dow

- Facility Work Group Leaders (FWGL) are responsible to authorize the team members as Permit Issuers and Procedure Users. The authorization must be documented for the site and should be shared with the Remediation Leader (RL). The nominated team members will be trained on these policies.

4.1.1 Jacobs Dow Program Procedure Use Policy (PUP)

(Reference Jacobs Dow Program Procedure Use Policy_V3-March 2021 and Jacobs Dow Program Legacy Site Procedure Template January 2019)

The following Procedures will be used for this project:

- Water Level Measurements/Groundwater Sampling
- Drilling Oversight/Soil Logging/Soil Sampling

- 4.1.2** High risk specific tasks or Life Critical Standards (LCS) **have additional requirements**. See the Jacobs Dow Program Procedure Use Policy and the specific LCS addenda or policy for requirements. These may require additional approvals, these tasks are:

LCS	JACOBS has...
Safe Work Permit Policy	Program Policy
Procedure Use Policy	Safe Work Permit Procedure Template
Hydroblasting/Pressure Washing	Program Policy
Line and Equipment Opening (LEO)	Permit Addendum
Energized Electrical Work	
Confined Space Entry (CSE)	HASP Addendum Permit Addendum
Elevated Work/Fall Protection	
Hot Work	
Isolation of Energy Sources (IOES)	
Heavy Equipment	

4.1.3 Jacobs Dow Program Safe Work Permit (SWP) Standard

(Reference Jacobs Dow Program Legacy Site Safety Work Permit Policy V3 – March 2021 and Jacobs Dow Program Legacy Site SWP Form V2)

The Jacobs Dow Program Safe Work Permit (SWP) Standard applies to all Jacobs work at Dow ER&R Legacy Sites, including work performed by subcontractors and lower-tier subcontractors.

4.1.3.1 SWP is ALWAYS required for:

Confined Space Entry (CSE)	Hot Tap
Crane Critical Lifts	High Energy Hot Work Flammable Areas
Diving Operations	Hot line and equipment opening (Hot LEO) if associated with high or moderate risk procedure
- Electrical Work - Class A1- energized electrical work - Lift equipment near uninsulated or bare power lines - SW-1 switching	- Fall Protection - removing or modifying permanent fall prevention - erecting, removing or moving life critical guards - erecting, dismantling and using suspended work platforms - using a crane for suspended work - using rope access
Excavation	Hydroblasting, except remotely controlled hydroblasting systems
Exchangers – exposed tube plugs	Small unmanned aerial systems
Explosive Devices	When requested by the person doing the work

4.1.4 Exempt Task List

Dow has approved a general exempt task list which covers all legacy sites. Sites may identify additional site-specific exempt tasks and may augment these standard task lists by creating and maintaining a site-specific exempt task list and obtaining approvals. Approvals will be completed by the Project Health & Safety Manager (HSM), the Facility Work Group Leader (FWGL), and the Jacobs Dow Program HSE Manager (in that order) and endorsed by the Dow Remediation Leader (RL).

If a task is exempt from permitting and procedures, there is still a requirement for a HIRA (formally and AHA) to be completed along with review/approval from the Project HSM. Refer to the HSE Field Handbook or the appropriate policy for the standard list of procedure exempt list.

4.2 Daily Safety Meetings and Point of Work Risk Assessments

Daily safety meetings are a means to coordinate project HSE activities and review HSE performance on a regular basis. Daily safety meetings are to be held with all project personnel in attendance, including subcontractors, to review the hazards, controls, and task HIIRAs that apply for each day's activities, as well as any environmental impacts, requirements and/or best management practices. Site supervisors/Field Team Leads (FTL) shall lead the daily safety meeting. Everyone involved in the day's work needs to participate and sign a sign-in form to show they've attended the meeting.

Point of Work Risk Assessments (POWRAs) (previously known as Pre-Task Safety Plans) shall be completed to focus on those hazards and environmental impacts posed by their specific work, taking into account field conditions and/or hazards at the point of work. If a POWRA shows an unacceptable level of risk, field crew shall contact the PM and HSM.

At active Dow sites, the safety meeting will be documented on the Safety Briefing Record and each individual would complete a STAC, ICard, or equivalent, as dictated by the site.

At legacy Dow sites, there may be different situations;

- One Jacobs person on the site – complete a POWRA
- Only Jacobs personnel on the site – complete a POWRA together. If a person from the group is working alone, they may also do a POWRA for just their work.
 - If working under a Procedure, they would complete the POWRA
 - If working under a SWP they would also need the briefing form that accompanies the SWP
- Jacobs and Subcontractors on the site – The entire group would hold a safety meeting and complete a Safety Briefing Form. Individual crews would be issued their SWP plus the corresponding Safety Briefing Form (included as part of the permit). Subcontractors may also have their company tool to complete as well. Crews conducting exempt tasks would complete the POWRA.

5. Project Organization and Responsibilities

A full description of responsibilities, including Employee Responsibilities and Authority, can be found in the Handbook, "Roles and Responsibilities."

5.1 Client

Contact Name:	Audrey Sidebottom
Phone:	780.998.5767

5.2 Jacobs

Site Manager	
SM Name:	Brian Carling
Office:	PHL
Telephone number:	610.384.0747
Cellular Number:	215.834.5397

Dow Program HSE Manager	
Name:	Jeanne Burgess
Office:	BOS
Telephone number:	
Cellular Number:	508-280-3653

Project Manager	
PM Name:	Chuck Ouelette
Office:	BOS
Telephone number:	
Cellular Number:	617.901.4859

Project Manager	
PM Name:	Garrett Hazebrouck
Office:	BOS
Telephone number:	
Cellular Number:	401.965.0126

Health and Safety Manager	
HSM Name:	Jason Kearns
Office:	SCH
Telephone number:	304.747.2511
Cellular Number:	304.610.6951

Environmental Manager	
EM Name:	Hope Wilson
Office:	ATL
Telephone number:	
Cellular Number:	678.656.5411

Designated Project Executive	
DPE Name:	Tom Loniewski
Office:	DET
Telephone number:	
Cellular Number:	517.202.3951

Safety Liaison	
SL Name:	Sawyer Fallon-Hornsberger
Office:	BOS
Telephone number:	
Cellular Number:	508.542.6975

Safety Liaison	
SL Name:	Max Newton
Office:	BOS
Telephone number:	
Cellular Number:	413.345.0024

Safety Liaison	
SL Name:	Benjamin Hendry
Office:	SYR
Telephone number:	
Cellular Number:	315.806.4029

5.3 Subcontractors

Subcontractor:	McMillan-McGee Corp. (MC2)
Contact Name:	Wayne Robella
Contact Number:	403.569.5106 (o) / 403.461.1669 (m)
Scope:	In Situ Thermal Treatment (ISTT) Installation / Operation & Monitoring / Decommissioning

Subcontractor:	GPRS
Contact Name:	Mark Bartlett
Contact Number:	419.843.9804
Scope:	Utility Clearance

Subcontractor:	Ahlstrom Schaeffer Electric Corp
Contact Name:	Misty Boe
Contact	716.665.6510, ext. 32
Scope:	Electrical Activities

Subcontractor:	Rogers Land Survey
Contact Name:	Cindy Rogers
Contact Number:	716.665.2828
Scope:	Surveying

Subcontractor:	Terra Testing
Contact Name:	Eric Hajek
Contact	724.746.9100
Scope:	Drilling/Well Installation

Subcontractor:	
Contact Name:	
Contact Number:	
Scope:	

5.4 Client Contractors

Subcontractor:	Ross Environmental Services
Contact Name:	Harold Blunt
Contact Number:	440.748.5895
Scope:	Removal of wood blocks, site grading, removal of fluids from system

Subcontractor:	
Contact Name:	
Contact Number:	
Scope:	

This PHSEP does not cover contractors that are contracted directly to the client or the owner. Jacobs is not responsible for the health and safety or means and methods of the client contractor's work, and we must never assume such responsibility through our actions (such as advising on health and safety issues).

5.5 Task Management Requirements / Subcontractor Oversight

Task	Subcontractor Oversight			HAZWOPER Related Task	Legacy Sites			Active Sites	
	Continuous	Effective	NA		Procedure	Permit	Exempt	Permit Required	AOP
Mobilization/Demobilization		X		N		X		NA	NA
Confirmation Soil Sampling (Hot Soil Sampling)	X			Y		X		NA	NA

In Situ Thermal Treatment (ISTT) Installation / Operation & Monitoring / Decommissioning	X			Y		X		NA	NA
Waste Management		X		Y		X		NA	NA

6. Task Hazard/Impact Identification and Risk Assessment

(See P&PS Work Instruction IB-HS-WI-0101-IB, P&PS Risk Assessment and Safety System of Work)

As part of the SSoW, in the Dow Program, a hazard identification and environmental impact risk assessment (HIIRA) must be undertaken for all tasks performed by Jacobs and their subcontractors. If working under a SWP or if the task is exempt, a HIIRA is required. When working under a procedure a separate HIIRA is not required as it is incorporated into the document.

A task hazard/impact identification (Table 1) has been completed for this project. Specific project tasks are listed in Table 1 with a designation of who could be affected by the hazards associated with the task; Jacobs, subcontractor, or both. Visitors and members of the public, when on or near the site, will be assumed to be affected by the same hazards and impacts as Jacobs or subcontractor personnel. Initial risk and residual risk associated with the hazards identified below shall be documented in the task HIIRA form or the procedure. Visitors that are trained and qualified to enter the work area must be escorted and briefed on the hazards they may be exposed to by reviewing applicable portions of the PHSEP and task HIIRAs.

The SSoW to mitigate these hazards includes:

- The hazard control sections listed in this plan (or referred to in the Handbook) The operating procedure or task HIIRA for each project task listed in Table 1; and
- The POWRA performed by the workers prior to performing the task.
- Subcontractors will have accepted AHA/JSA or procedures

Jacobs' task HIIRAs for the tasks below are referenced to this plan. Jacobs' subcontractors are required to submit a similar SSoW (e.g., job or activity hazard analyses, HSE plan, procedure) specific to their scope of work for acceptance by Jacobs HSM prior to the start of work. Additions or changes in field activities, equipment, tools, or material used to perform work or hazards not addressed requires an updated to be prepared and reviewed by Jacobs.

Table 1: Project Tasks and Associated Hazards and Environmental Impacts

Associated Hazard Section	Project Activity	Mob / Demob	Utility locates / Survey	In situ thermal treatment (ISTT) installation / Operation & Monitoring / Decommissioning / Soil Sampling	Waste Management
General Hazards – Refer to General Hazards and Controls in the F&ES HSE Field Handbook, Section 7, or Jacobs HSE Procedures and Work Instructions.					
Bloodborne Pathogens (if first aid is rendered)		J, S	J, S	J, S	J, S
Chemical and Petroleum Storage		J, S	J, S	J, S	J, S
COVID-19 Exposure		J, S	J, S	J, S	J, S
Driving Safety (Critical Risk – Driving)		J, S	J, S	J, S	J, S
Electrical Safety (Critical Risk – Electrical Work)				J, S	
Extended Work Hours & Fatigue Management (when applicable)		J, S	J, S	J, S	J, S
Field Ergonomics and Manual Lifting		J, S	J, S	J, S	J, S

Table 1: Project Tasks and Associated Hazards and Environmental Impacts

Associated Hazard Section	Project Activity	Mob / Demob	Utility locates / Survey	In situ thermal treatment (ISTT) installation / Operation & Monitoring / Decommissioning / Soil Sampling	Waste Management
Field Vehicles (Critical Risk – Driving)		J, S	J, S	J, S	J, S
Fire Prevention		J, S	J, S	J, S	J, S
General Practices and Housekeeping		J, S	J, S	J, S	J, S
Hazard Communication		J, S	J, S	J, S	J, S
Knife Use	Open-bladed knife use (leatherman, pocket knife) not permitted. Contact HSM if use becomes necessary				
Lighting		J, S	J, S	J, S	J, S
Occupied Facility Siting	Not applicable to this project.				
Personal Hygiene		J, S	J, S	J, S	J, S
Personal Security		J, S	J, S	J, S	J, S
Shipping and Transportation of Hazardous Waste					J, S
Substance Abuse		J, S	J, S	J, S	J, S
Unknown or Suspect Objects/Material		J, S	J, S	J, S	J, S
Project-Specific Hazards – Refer to the F&ES HSE Field Handbook, Section 8, and the additional project-specific controls in this plan when specified.					
Compressed Gas Cylinders (calibration gas)			J, S	J, S	
Crane				J, S	
Drilling				J, S	
Earthmoving Equipment				J, S	
Electrical				J, S	
Energized Electrical Work (Critical Risk – Electrical Work)				S	
Forklift Operations				J, S	
Hand and Power Tools		J, S	J, S	J, S	J, S
Hot Soil				J, S	
Indoor Air Quality				J, S	J, S
LO/TO				J, S	
Portable Generators				J, S	

Table 1: Project Tasks and Associated Hazards and Environmental Impacts

Associated Hazard Section	Project Activity	Mob / Demob	Utility locates / Survey	In situ thermal treatment (ISTT) installation / Operation & Monitoring / Decommissioning / Soil Sampling	Waste Management
	Pressurized Lines / Equipment			J, S	
	Rigging			J, S	
	Slips, Trips and Falls	J, S	J, S	J, S	J, S
	Spotters during Vehicle Backing Operations (Critical Risk – Mobile Equipment)	J, S	J, S	J, S	J, S
	Traffic Control, if necessary	J, S	J, S	J, S	J, S
	Unauthorized Personnel Safety (see hazard section below)			J, S	
	Utilities (overhead)			J, S	
	Utilities (underground)		J, S	J, S	
	Welding / Cutting			J, S	
	Winter Driving (see hazard section below)	J, S	J, S	J, S	J, S
	Working Around Material Handling Equipment (Critical Risk – Mobile Equipment)			J, S	J, S
	Working Alone			J	
Physical Hazards – Refer to Physical Hazards in the F&ES HSE Field Handbook, Section 9, and the additional project-specific controls in this plan when specified.					
	Noise	J, S	J, S	J, S	J, S
	Ultraviolet Light exposure (sunburn)	J, S	J, S	J, S	J, S
	Temperature Extremes	J, S	J, S	J, S	J, S
Biological Hazards – Refer to Biological Hazards in the F&ES HSE Field Handbook, Section 10, and the additional project-specific controls in this plan when specified.					
	Bees and Other Stinging Insects	J, S	J, S	J, S	J, S
	Mosquitos and Dengue, Chikungunya, Zika and West Nile Viruses	J, S	J, S	J, S	J, S
	Spiders – Brown Recluse and Black Widow	J, S	J, S	J, S	J, S
	Ticks	J, S	J, S	J, S	J, S
Environment Impacts – Refer to additional project-specific controls in this plan, specific HIIRAs, or in the project's stand-alone environmental plan (if applicable).					
	Air Pollution/ Dust Control	J, S		J, S	J, S

Table 1: Project Tasks and Associated Hazards and Environmental Impacts

Associated Hazard Section	Project Activity	Mob / Demob	Utility locates / Survey	In situ thermal treatment (ISTT) installation / Operation & Monitoring / Decommissioning / Soil Sampling	Waste Management
Waste Management (including waste water, see field project instructions)		J, S	J, S	J, S	J, S
Stormwater Pollution		J, S		J, S	J, S
Underground Injection Control				**	

J – Hazard identification applicable to Jacobs personnel

S – Hazard identification applicable to Subcontractor personnel

* For activities above identified as Critical Risks, refer to Jacobs Global Work Instruction JJ-HS-WI-0303-JJ, *Critical Risk Management*, the [Critical Risk Awareness Booklet](#), and the [Critical Risk Awareness Guide for Managers and Supervisors](#). For Environmental Aspects, refer to P&PS Work Instruction [IB-HS-WI-0101-IB, Risk Assessment and Safe System of Work](#), Table 9.4.

** If potable water injection becomes necessary during operations, contact the Environmental Manager prior to this activity.

7. Hazards and Controls

(See P&PS Work Instruction IB-HS-WI-0101-IB, P&PS Risk Assessment and Safety System of Work)

Safe work practices and hazard control measures to reduce or eliminate potential hazards as identified in Table 1 are stated in the Handbook, Sections 7-10, the associated Jacobs Procedure, Work Instruction, or Guideline, and/or are addressed in task HIRAs. Any additional project-specific control measures, or those hazards requiring additional emphasis, are identified in the following sections.

Always consult the appropriate Procedures or Work Instruction referenced in the hazard sections to ensure all requirements are implemented. All employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. Jacobs employees and subcontractors who do not understand any of these provisions should contact the HSM for clarification prior to commencing with work.

A POWRA or other tools shall be performed, depending upon the situation, at the start of each shift or when conditions significantly change. Implement the StepBack process (see Handbook) throughout the duration of the task.

7.1 General Hazards and Controls

7.1.1 RealWare Safety Considerations.

The use of RealWare was initially conceived for use as a tool for

- A field worker to have immediate access to information (schematics, SOPs, guidance);
- A field worker to have access to an off-site expert to get a consult
- Off-site parties to be able to become familiar with a site they have never visited or where changes have been made since their last visit.
- Off-site parties to be able to audit a worker or project site, either in real-time or by watching video after the fact.

Specifically, the Dow Program is using RealWare to:

- Give site tours (Client, Jacobs)
- Engage off-site experts
- Pre-bid walks with subcontractors
- HSE audits

We are using this tool very interactively and need to be aware of mitigate potential hazards. We want to preserve our ability to use this technology; one incident such as a slip/trip/fall could not only hurt one of our own, it could terminate our usage. We can do it safely.

Wearer Safety Considerations

- Talking when using RealWare presents similar distractions to walking and talking on your cell phone, which we avoid. "I'm walking; I'm not talking", stop walking when needing to talk. When you are done talking, ensure your path is clear before starting to walk again.
- Remind observers that you will take questions and requests when stationary.

- Have a “buddy” walk with the RealWare user to observe any obstacles in the path of travel and keep the wearer safe. The “buddy” is the eyes on the ground and can maneuver or stop the wearer if there are unsafe conditions. The “buddy” must walk with the wearer and be focused on the ground or any other potential hazards.
- Stop using RealWare immediately if you experience headache, vertigo, dizziness or nausea.
- Do not use the RealWare display while operating any vehicle.
- Move the boom are completely out of your line of sight when not using the display.
- Maintain situational awareness of your surroundings.
- Take time to understand the mounting alignments.
- Always use your dominant eye for comfortable viewing.
- Always wear RealWare with eye protection.

Observer Safety Considerations

- Avoid talking to wearer when they are walking. Save requests and questions until they are stationary.
- It may feel you are walking along with the wearer (because it looks that way), you are a potentially distracting voice in the wearer’s ear.

Intervention

- “If you see something, say something”, a benefit of RealWare is that we have new observers of our people in the field.
- Intervene on each other if the wearer is being distracted.
- Intervene on the wearer if you observe potentially unsafe behaviors or conditions (poor housekeeping, wearer not holding railing on stairways, rushing, slip/trip/fall hazards)

7.2 Project-Specific Life Critical Standards (LCS)

Dow Legacy sites will follow all Jacobs-Dow Program Life Critical Standards and applicable requirements.

The following LCS apply to this project:

- Electrical Work
- Heavy Equipment
- Hydroblasting-Pressure Washing
- Isolation of Energy Sources (IOES)
- Line and Equipment Opening

7.3 Project-Specific additional requirements (non-LCS)

7.3.1 Cranes

Below are the hazard controls and safe work practices to follow when working around or operating cranes. Ensure the requirements below are followed.

- Crane operators are prohibited from using any wireless device while operating a crane. Equipment must be stopped before using devices such as two way radios or cell phones. If a wireless device is required for a certain operation, the PM and RHSM must authorize the wireless use on a case by case basis and make sure limitations are addressed in the project safety plan.
- Cranes shall be operated by a certified crane operator. After November 10, 2014, only operators possessing a certificate from a nationally accredited testing organization, an audited employer training program, or U.S. military, or state- or provincial-issuing agency will be authorized to operate cranes.
- The crane's operations manual and load chart specifically designed for the crane shall be in the crane at all times.
- The crane must have a current annual inspection to include load test certification (within the last 12 months) that meets all state and provincial and federal safety standards. Documentation of this inspection must be available for review.
- A competent person will inspect the crane daily to ensure it is in safe operating condition. The daily crane inspection log provided within the crane manufacturer's operations manual shall be used.
- All rigging equipment must be inspected by a competent person prior to use for signs of excessive wear; equipment found to be damaged will be tagged and removed from service.
- A qualified and competent Assembly/Disassembly (A/D) Director shall be assigned when cranes must be assembled onsite. The A/D Director is responsible for ensuring the crane is assembled and disassembled according to manufacturer requirements; performing training for the A/D crew; and ensuring sufficient ground conditions exist for crane placement; among other responsibilities.
- The assembly/disassembly process must comply with manufacture's requirements, including having an AHA for the task.
- A critical lift plan shall be prepared when the lift is estimated to be greater than 75 percent of the crane capacity or when two cranes will be used to make a lift.
- A pre-lift meeting will be conducted to include all parties involved in that day's crane operation.
- Only one qualified person shall be designated to signal the crane operator. This person shall be thoroughly familiar with the ANSI standard method of hand signals and an illustration of these signals shall be posted at the job site.
- No personnel shall be permitted under the load at any time.
- Tag lines shall be attached to every load being made by the crane.
- The swing radius of the rear rotating superstructure (counterweight) of the crane shall be barricaded and no entrance allowed.
- Suspended loads shall not pass over workers or occupied buildings at any time.
- Complete the self-assessment checklist for crane-suspended personnel platforms whenever they are being used.

- FES employees exposed to hazards posed by crane operations, must be trained in hazards awareness and control procedures.

7.3.1.1 Power Line Safety

It must be determined whether equipment operations including assembly/disassembly, positioning, and crane operation (including traveling with a load) will occur in proximity to power lines within 20 feet (6.1 meters) for line voltage up to 350 kilo volts (kV), and within 50 feet (15.2 meters) for line voltage between 350 kV to 1000 kV. For power lines over 1000 kV, the distance must be determined by the utility/operator or qualified registered professional engineer in electrical power transmission and distribution.

If equipment operations are within proximity of aforementioned distances to power lines, one of the following options must be implemented to prevent encroachment and electrocution:

- Option 1: Deenergize and ground the power. Confirm from the utility/operator that the power line has been deenergized and visibly grounded at the worksite
- Option 2: If the voltage is not determined, ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet (6.1m) by:
 - Conduct a planning meeting with the operator and other workers in the area to review the actions that will be taken to prevent encroachment and electrocution.
 - Use non-conductive tag lines.
 - Erect and maintain an elevated warning line, barricade or line of signs in view of the operator, either with flags or other high-visibility markings at 20 feet (1.6m) from the power line. A spotter must be used when the operator does not have clear line of sight to the elevated warning line.
 - To prevent encroachment, the operator can use a proximity alarm, or position a dedicated spotter with visual aids to demarcate the encroachment and constant communication access to the operator.

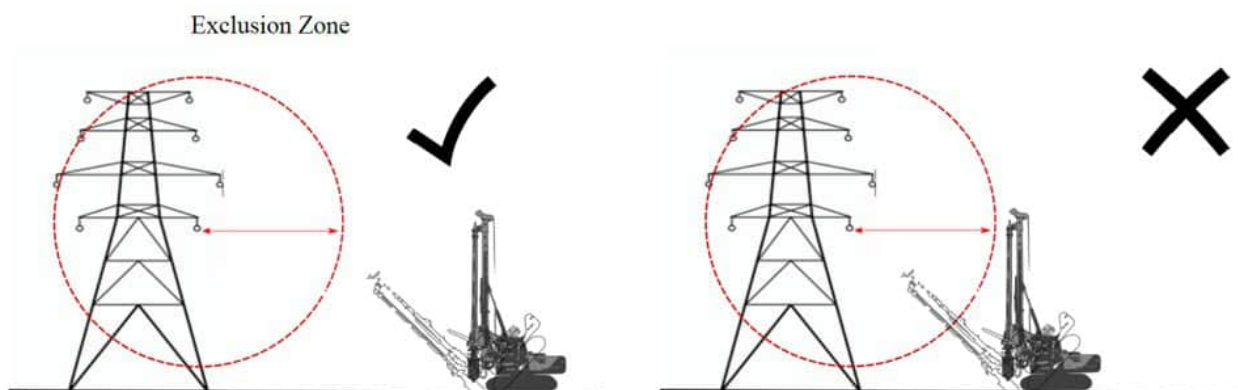
If the line voltage can be determined, and if any part of the equipment, line load or load (including rigging and lifting accessories) would encroach within that specified distance listed in Table 1, then the requirements listed in Option 2 must be implemented.

Table 6-1. Minimum Clearance Distances

MINIMUM DISTANCES FROM POWERLINES – per Jacobs Utility Avoidance Work Instruction

Powerlines Nominal System Kv	Minimum Required Distance ("exclusion zone"), Feet (Meters)
0-350	20 (6.1)
351-500	25 (7.6)
501 - 1000	45 (13.7)
Over 1000	Established by utility owner/operator or by a professional engineer in electrical power transmission/distribution

(These distances have been determined to eliminate the potential for arcing based on the line voltage.)



For equipment traveling within 20 feet (6.1m), under or near power lines without a load, the clearance distances described in Table 6-2 must be maintained and the following actions implemented.

- A dedicated spotter is assigned during equipment travel, positioned to effectively gauge the clearance distance, and is in continuous communication with the operator.
- During equipment travel, the boom/mast and support system are sufficiently lowered to ensure clearance distances are maintained, along with taking into consideration of the effects of speed and terrain.

Table 6-2. Minimum Clearance Distances While Traveling with No Load

Voltage (nominal, kV, alternating current)	Minimum Clearance – Feet (meters)
Up to 0.75	4
Over 0.75 to 50	6
Over 50 to 345	10
Over 345 to 750	16
Over 750 to 1000	20
Over 1000	Established by the utility owner/operator or by a qualified registered professional engineer in electrical power transmission and distribution

7.3.2 Drilling Safety

Below are the hazard controls and safe work practices to follow when working around or performing drilling. Ensure the requirements below are followed.

- For interior drilling the rig travel path shall be verified and spotter used when in motion / mast raising & lowering. Exhaust will be exited from the building and CO monitored by the driller. No visible dust will be generated by drill rig action. Noise and vibration will be monitored per work plan. Any unusual odors should be brought to attention of SL for evaluation of additional monitoring and ventilation.
- When considering drilling at sites with nearby monitoring wells, particularly in cases where drilling methods utilize pressurized fluids (air or water), consider the potential risk of hydraulic communication between the drilling location and the adjacent wells and/or other subsurface conduits.
- The drill rig is not to be operated in inclement weather.

- The driller is to verify that the rig is properly leveled and stabilized before raising the mast.
- Personnel should be cleared from the sides and rear of the rig before the mast is raised.
- The driller is not to drive the rig with the mast in the raised position.
- The driller must check for overhead power lines before raising the mast. Maintain a minimum distance of 10 feet (3 meters) between mast and overhead lines (<50 kV) and an additional 0.4 inches for every 1 kV over 50kV. Verify the voltage of nearby overhead power lines to determine the minimum distance.
- All drilling sites must be evaluated for potential contamination by consulting with the client, reviewing historic data related to properties' past owners and uses, prior investigation reports or through vendor services.
- If unexpected contamination is discovered during drilling operations, all activities must immediately stop and the FES SC/SL or PM shall be immediately notified. Work shall not recommence until authorized by the FES PM.
- If contamination is suspected or confirmed at the drilling site, the following must be implemented:
 - The standard hazardous materials/hazardous waste clause is included in our contract with the client and in our subcontract agreements
 - The drilling subcontract work plans address appropriate disclosure of potential contamination, any required training (e.g., HAZWOPER) and the requirement to plan for unexpected contamination. The subcontractor work plan and submittals are reviewed for appropriate licenses, certifications, permits, training, sampling and analytical, waste characterization, and waste management, including accumulation, transport and disposal.
- Personnel should stand clear before rig startup.
- The driller is to verify that the rig is in neutral when the operator is not at the controls.
- Become familiar with the hazards associated with the drilling method used (cable tool, air rotary, hollow-stem auger, etc.).
- Do not wear loose-fitting clothing, watches, etc., that could get caught in moving parts.
- Do not smoke or permit other spark-producing equipment around the drill rig.
- The drill rig must be equipped with a kill wire or switch, and all personnel are to be informed of its location.
- Be aware and stand clear of heavy objects that are hoisted overhead. Ensure any components subject to load bearing are rated and not shop-made.
- The driller is to verify that the rig is properly maintained in accordance with the drilling company's maintenance program.
- The driller is to verify that all machine guards are in place while the rig is in operation.
- The driller is responsible for housekeeping (maintaining a clean work area).
- The drill rig should be equipped with at least one fire extinguisher.
- If the drill rig comes into contact with electrical wires and becomes electrically energized, do not touch any part of the rig or any person in contact with the rig, and stay as far away as possible. Notify emergency personnel immediately.
- Use the drilling self-assessment checklist to evaluate drilling operations.

7.3.3 Earthmoving/Heavy Equipment

Below are the hazard controls and safe work practices to follow when working around or operating heavy equipment. Ensure the requirements below are followed.

- FES authorizes only those employees qualified by training or previous experience to operate material handling equipment.
- FES employees must be evaluated prior to operating earthmoving equipment by a FES earthmoving equipment operator evaluation designated person. This evaluation will be documented on an Earthmoving Equipment evaluation form.
- Heavy equipment operators are prohibited from using any wireless device while operating equipment. Equipment must be stopped before using devices such as two way radios or cell phones. If a wireless

device is required for a certain operation, the PM and RHSM must authorize the wireless use on a case by case basis and make sure limitations are addressed in the project safety plan.

- Equipment must be checked at the beginning of each shift to ensure the equipment is in safe operating condition and free of apparent damage. The check should include: service brakes, parking brakes, emergency brakes, tires, horn, back-up alarm, steering mechanism, coupling devices, seat belts and operating controls. All defects shall be corrected before the equipment is placed in service. Documentation of this inspection must be maintained onsite at all times (use the Earthmoving Equipment Inspection form if operated by FES).
- Equipment must be on a stable foundation such as solid ground or cribbing; outriggers are to be fully extended.
- Equipment must not be used to lift personnel; loads must not be lifted over the heads of personnel.
- Equipment, or parts thereof, which are suspended must be substantially blocked or cribbed to prevent shifting before personnel are permitted to work under or between them. All controls shall be in a neutral position, with the motors stopped and brakes set.
- Equipment which is operating in reverse must have a reverse signal alarm distinguishable from the surrounding noise or a signal person when the operators view is obstructed.
- When equipment is used near energized power lines, the closest part of the equipment must be at least 10 feet (3 meters) from the power lines less than 50 kilovolts (kV). Provide an additional 4 feet (1.2 meters) for every 10 kV over 50 kV. A person must be designated to observe clearances and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. All overhead power lines must be considered to be an energized until the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Underground utility lines must be located before excavation begins; refer to the Utilities (underground) section.
- Operators loading and unloading from vehicles are responsible for seeing that vehicle drivers are in the vehicle cab or in a safe area.
- The parking brake shall be set whenever equipment is parked; wheels must be chocked when parked on inclines.
- When not in operation, the blade or bucket must be blocked or grounded; the master clutch must be disengaged when the operator leaves the cab. When equipment is unattended, power must be shut off, brakes set, blades or buckets landed and shift lever in neutral.

7.3.4 Energized Electrical Work

All electrical systems shall be considered energized unless lockout/tagout procedures are implemented and zero energy verified in accordance with the Lockout/Tagout section of this Handbook.

Energized electrical work is defined as work performed on or near energized electrical systems or equipment with exposed components operating at 50 volts AC (or 100 volts DC) or greater. Working near energized live parts is any activity inside a Limited Approach Boundary.

Evaluate the use remote testing device for troubleshooting (e.g., Fluke 233 Remote Display Multimeter or equivalent). This type of testing device eliminates the exposure to unprotected energized electrical parts.

Electrical wiring and equipment shall be de-energized prior to conducting work unless it can be demonstrated that de-energizing introduces additional or increased hazards or is unfeasible due to equipment design or operational limitations. When energized electrical work is the only means that work can be performed (e.g., for voltage testing or troubleshooting), all requirements must be implemented including the following:

- Only qualified personnel are permitted to work on unprotected energized electrical systems. To be a FES qualified person, an employee must meet all of the following bulleted requirements:

- The employee must be assigned one of the two worker categories and up-to-date on the requirements:
 - Energized Electrical Trained Worker Limited (EETW-L) which is restricted to working on electrical systems 480 VAC and below or working in the Limited Approach Boundary of systems that have a designated Arc Flash PPE Category of ≤ 2 , which **does not** require First Aid/CPR or AED training or the buddy system.
 - Energized Electrical Trained Worker (EETW) allows individuals to work on equipment rated at Arc Flash PPE category 2, which requires the individual to complete First Aid/CPR or AED, and implement the buddy system.
- Possess credentials, electrical educations, training and task specific knowledge, experience and capability (i.e., a qualified person may be qualified for one type of system or task, but not another).
- "Energized Electrical Qualified Person Assessment" must be completed annually by the RHSM or applicable operations lead/supervisor which requires a skill demonstration performed by the qualified person while wearing the necessary PPE and using the required tools. This form must be submitted to the SPA and maintained with the project files.
- Employees shall complete the Jacobs energized electrical refresher safety training every 3 years.
- First Aid/CPR and AED training (EETW only), release of victim, completed annually (Release of victim refresher available on the VO). For annual the First Aid, CPR and AED requirement, an employee may retake the course through a certified provider (including local organizations), conduct a drill where CPR and AED skills are demonstrated, or complete the American Red Cross CPR/AED Refresher course.
- If FES personnel are only overseeing a qualified subcontractor performing energized electrical work and not entering the Limited Approach Boundary or tasked to perform troubleshooting near unprotected energized parts, then the '2015 NFPA 70E Awareness for Oversight of Work' VO training is required (i.e., the above training requirements would not apply).
- The client sector HSE Lead must approve any energized electrical work that is above an Arc Flash PPE Category 2 or an incident energy greater than 8 calories/cm².
- An Electrical Hazard Analysis must be performed to identify energized electrical safe work practices before any person approaches exposed live parts within the Limited Approach Boundary (as determined by the shock hazard analysis), by performing both shock hazard analysis and flash hazard analysis, which comprise the electrical analysis.
- The Energized Electrical Work Permit must be completed prior to working on unprotected energized electrical systems.
- Provisions for first responder equipment, such as a first aid kit, AED, communication devices, and non-conductive release equipment (when disconnect means is not in the immediate vicinity of the work) shall be made available. If an AED is available at the host employer's facility, the location of the AED must be determined and personnel trained in its use.
- FES employees designated as qualified persons working on live parts of energized electrical systems 480 volts and above shall implement the buddy system. This means that two EEQPs must be engaged in this work. Working on live parts of energized electrical systems 480 volts and above means actual contact with live parts or working within the Prohibited Approach Boundary, which is one inch (2.54 cm) for 480 volt systems.
- The buddy system requires the presence of an additional EEQP who shall stand by and render assistance, or summon help for the first person, in the event the first person is inadvertently shocked while performing the work. The second person shall not be assigned to additional distracting duties or tasks while the energized electrical work is being performed and shall know the location of the isolation device(s) for the equipment being worked on.
- Workers designated as qualified persons shall wear the required electric shock and arc-flash PPE, as specified by the qualified person responsible for the energized electrical operations.

- Safety signs, safety symbols or incident prevention tags, meeting applicable American National Standards Institute (ANSI) Standards, shall be used where necessary to warn employees about electrical hazards.
- Barricades shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas containing live parts. Conductive barricades shall not be used where it may cause an electrical hazard. Barricades shall be placed no closer than the Limited Approach Boundary.
- If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect unqualified employees. The primary duty and responsibility of an attendant providing manual signaling and alerting shall be to keep unqualified employees outside a work area where the unqualified employee might be exposed to electrical hazards. An attendant shall remain in the area as long as there is a potential for employees to be exposed to the electrical hazards.
- Employees shall not perform tasks near exposed energized parts where lack of illumination or an obstruction precludes observation of the work. Employees shall not reach blindly into areas that may contain energized parts.
- Work shall be performed in accordance with National Fire Protection Association (NFPA) 70E requirements (2015 edition).
- Follow all control measures and procedures identified on the Energized Electrical Work Permit and the AHA. Complete the self-assessment checklist for energized electrical work.

7.3.5 Public / Client Safety

Due to the fact that this work involves work in assessable areas, emphasis must be placed on warning and directing unauthorized personnel to remain adequate distance from work areas. Work areas will be clearly demarcated and durable, weatherproof signs will be posted to indicate no authorized entry.

Should unauthorized personnel inadvertently enter the work area, site personnel shall cease all work until the unauthorized person is escorted out of the work area.

Emergency power cutoff to ISTT system upon entry to treatment field will be tested as necessary to ensure effectiveness.

7.4 Environmental Aspects, Impacts and Controls

Reference project environmental management plan (EMP) or work instructions.

8. Required Permits

(See Jacobs Global Work Instruction JJ-HS-WI-0305-JJ, Safe Work Permits)

Safe work permits are used as a work control process for defined hazardous activities. The use of work permits may be required by clients or as a result of task risk assessment.

Safe work permits are mandatory for the following types of operations (others based on client or other requirements may be needed as well):

(This is just a reference tool to show all of the permits)

Dow Specific SWP (see Dow specific requirements)	Jacobs Specific SWP (see Jacobs BMS requirements)
SWP – General	Excavation (IB-HS-WI-0333-IB) - Utility Avoidance (IB-HS-WI-0335-IB) - Permit to Dig (IB-HS-WI-0333-IB-F-01) (for hand digging, daylighting, and machine dig) - Excavation Inspections (IB-HS-WI-0333-IB-F-03)
Confined Space Entry (CSE)	
Electrical Safety (Elevated Work Near Electrical Lines & Energized Electrical Work)	
Elevated Work / Fall Protection	Ground Disturbance - Utility Avoidance (IB-HS-WI-0335-IB) - Utility Verification (IB-HS-WI-0335-IB-F-01)
Heavy Equipment	
Hot Work	Lift Plan (IB-HS-WI-0345-IB) - Utility Avoidance (IB-HS-WI-0335-IB) - Lifting Plan (IB-HS-WI—0345-IB-F-01) (if Jacobs is responsible for producing lift plan) - Lifting Checklist (IB-HS-WI-0345-IB-F-02) - Lifting Equipment and Accessories Inspection Record (IB-HW-WI-0345-F-03) (if Jacobs is responsible for inspection)
Hydroblasting / Pressure Washing	
Isolation of Energy Source (IOES)	
Line and Equipment Opening (LEO)	
	Energized Electrical Work - Electrical Safety (IB-HS-WI-0344-IB) - Electrical Safety Permit (IB-HS-WI—0344-IB-F-01)

Required Permits for Project work

Permit Type	Activities/Tasks
SWP – General	Mobilization/Demobilization Utility Locate Survey In Situ Thermal Treatment (ISTT) Installation Operation & Monitoring Decommissioning Hot Soil Sampling
Ground Disturbance	Mobilization/Demobilization In Situ Thermal Treatment (ISTT) Installation Hot Soil Sampling
Heavy Equipment	Mobilization/Demobilization In Situ Thermal Treatment (ISTT) Installation Decommissioning
Hydroblasting / Pressure Washing	In Situ Thermal Treatment (ISTT) Installation Hot Soil Sampling
Isolation of Energy Sources	In Situ Thermal Treatment (ISTT) Installation System Maintenance Decommissioning
Line and Equipment Opening	System Maintenance Decommissioning
Lift Plan	In Situ Thermal Treatment (ISTT) Installation Decommissioning

Coordinate work with the project team and client's operations representative (if required) as necessary to ensure that a properly filled out work permit is issued and includes relevant supporting information:

- The hazards/impacts and limitations at the site are assessed;
- All precautions are taken and safe practices followed;
- A work area review is conducted prior to signing and authorizing work; and
- Verify by means of a signature that the work permit has been reviewed and limitations and controls measures understood

Inspect the permit and tasks to ensure the permit requirements are still being met. Immediately stop work and notify supervision if any changes in job conditions or hazards take place. Ensure the permit is closed out where required.

9. Hazard Communication

(See P&PS Work Instruction IB-HS-WI-0202-IB, Chemical Hazard Communication)

As indicated in Section 7 of the Handbook, under “Hazard Communication,” the hazard communication (HazCom) coordinator (the SL or qualified designee) must perform the following (additional HazCom duties are outlined in the Handbook):

- Complete an inventory of chemicals brought on site by Jacobs using the chemical inventory form included as an attachment to this PHSEP;
- Confirm that an inventory of chemicals brought on site by subcontractors is available;
- Request or confirm locations of Globally Harmonized System (GHS) compliant (i.e., consisting of 16 sections that appear in the same order and contain uniform information regarding the chemical) safety data sheets (SDSs) from the client, contractors, and subcontractors for chemicals to which Jacobs employees potentially are exposed;
- For chemicals used by Jacobs workers, before or as the chemicals arrive onsite, obtain a SDS for each hazardous chemical, include on the chemical inventory sheet (attached to this PHSEP), and maintain SDSs in an accessible binder onsite long with the chemical inventory sheet. Ensure everyone knows where SDSs are kept;
- The six required elements of the GHS label must include the product identifier, pictograms, signal word, hazard statements, precautionary statements, and the name, address, and telephone number of the chemical manufacturer, importer or other responsible party;
- The manufacturer’s original label on any incoming regulated product must not be removed or defaced. The manufacturer’s label and markings must be retained on the package or container until it is sufficiently cleaned of residue and purged of vapors to remove any potential hazards;
- Ensure all secondary containers are labeled in compliance with GHS labeling requirements. If GHS compliant information has not yet been provided by the manufacturer or chemical distributor, the HCC must contact the manufacturer or chemical distributor and document in the chemical inventory when the GHS labeling information will be available, until the labeling requirement is fulfilled;
- In the United States, the container label shall be in English, although labels in other languages may be kept as well. Container labels in other languages for non-speaking English-speaking workers will be made available when specified by the client for their project site or facility;
- Give employees required chemical-specific HazCom training using the chemical-specific training form included as an attachment to this PHSEP and ensure that the GHS supplemental VO module has been completed.
- Ensure that chemical use is included in the task HIRA.

10. Contaminants of Concern

The table below summarizes the potential contaminants of concern (COC) and their occupational exposure limit and signs and symptoms of exposure. The table also includes the maximum concentration of each COC and the associated location and media that was sampled (groundwater, soil boring, surface soil). These concentrations were used to determine engineering and administrative controls described in the "Project-Specific Hazard Controls" section of this PHSEP, as well as PPE and site monitoring requirements.

Table 3: Contaminants of Concern

Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limits ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Acetone	GW: 678 (MW-21D) SB: SS:	250 ppm	2500 ppm	Irritation to the eyes, nose, throat. Headaches, dizziness, central nervous system depression, dermatitis.	9.69
cis-1,2-Dichloroethene	GW: 185 (MW-21D) SB: SS:	200 ppm	1,000 ppm	Irritated eyes, CNS depression	10.0
Ethylbenzene	GW: 13.3 (MW-29S) SB: SS:	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Tetrachloroethene	GW: ND SB: SS:	25 ppm	150 Ca	Eye, nose, and throat irritation; nausea; flushed face and neck; vertigo; dizziness; sleepiness; skin redness; headache; liver damage	9.32
Toluene	GW: 0.512 (MW-29S) SB: SS:	20 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Trichloroethene	GW: 30 (MW-21D) SB: SS:	10 ppm	1,000 Ca	Headache, vertigo, visual disturbance, eye and skin irritation, fatigue, giddiness, tremors, sleepiness, nausea, vomiting, dermatitis, cardiac arrhythmia, paresthesia, liver injury	9.45
Vinyl Chloride	GW: 63.4 (MW-21D) SB: SS:	1 ppm	NL Ca	Weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities	9.99
Xylenes	GW: 41.15 (MW-29S) SB: SS:	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56

Contaminant	Location and Maximum ^a Concentration (ppm)	Exposure Limits ^b	IDLH ^c	Symptoms and Effects of Exposure	PIP ^d (eV)
Footnotes: ^a Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water). ^b Appropriate value of permissible exposure limit, recommended exposure limit, or threshold limit value listed. ^c IDLH = immediately dangerous to life and health (units are the same as specified "exposure limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen. ^d PIP = photoionization potential; NA = Not applicable; UK = Unknown. eV = electron volt mg/kg = milligram per kilogram mg/m ³ = milligrams per cubic meter ug/m ³ = micrograms per cubic meter					
Potential Routes of Exposure					
Dermal: Contact with contaminated media. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of PPE.		Inhalation: Vapors and contaminated particulates. This route of exposure is minimized through use of engineering controls, administrative controls and proper use of respiratory protection when other forms of control do not reduce the potential for exposure.		Other: Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).	

11. Site Monitoring

11.1 Direct Reading Monitoring

For each task listed in the table below, perform the associated monitoring ensuring the equipment is calibrated daily (or bump tested) according to the manufacturer's recommendations.

Note: The term "calibration" is used but it may actually be a "bump test" depending on what the manufacturer requires. There is a difference between actually calibrating (manually adjusting sensors to read a value) and "bump testing" (field verification that the instrument is reading what it's supposed to.) Many equipment manufacturers now say that performing actual calibration daily can damage the sensors, so they recommend a "bump test" daily or before use to verify the instrument is reading correctly, and they state a prescribed calibration frequency requirement. Refer to the manufacturer's instrument manual on the recommended daily calibration or bump test requirements. Be sure the calibration/bump test is documented.

Use the Daily Site Monitoring Form (or equivalent) to document the calibration (or bump test) and the readings taken. Retain area monitoring readings with project records.

Personal Breathing Zone and Area Samples

Personal breathing zone and area sampling results must be sent immediately to the HSM..

Exposure records (breathing zone and personal air sampling) must be preserved for the duration of employment plus thirty years. Copies of all project exposure records (e.g., copies of Daily Site Monitoring form or field logbook pages where breathing zone readings are recorded along with associated calibration) shall be sent to the F&ES Safety Program Assistant for retention and also maintained in the project files.

Subcontractors are responsible for air monitoring and performing integrated personal sampling for their employees as documented in their PHSEP or, if permitted, according to the table below.

Table 4: Direct Reading Monitoring Specifications

Instrument	Tasks	Action Levels ^a	Action to be Taken when Action Level reached	Frequency ^b	Calibration
PID: MultiRae PID with 10.6 eV lamp or equivalent	Intrusive Work ISTT Operation (ambient) Line breaking during ISTT operation Soil Sampling	0-1 ppm >1 ppm → Pull VC tube, Stop work; Notify HSM if tube >1ppm 0-5 ppm	Level D Level D – no VC detection	Initially and periodically during tasks	Bump Test Daily Calibrate per manufacturer recommendations
LEL Monitor: MultiRae	Intrusive Work Hot Work ISTT Operation (ambient) Line breaking during ISTT operation	0-10%: >10% LEL:	No explosion hazard Explosion hazard; evacuate or vent	Continuous during tasks	Bump Test Daily Calibrate per manufacturer recommendations

Instrument	Tasks	Action Levels ^a	Action to be Taken when Action Level reached	Frequency ^b	Calibration
O2 Monitor: MultiRAE	ISTT Operation (ambient) and use of combustion engines within Bldg	>25% ^c O ₂ : 20.9% ^c O ₂ : <19.5% ^c O ₂ :	Explosion hazard; evacuate or vent Normal O ₂ O ₂ deficient; vent or use SCBA	Initially and periodically during tasks	Bump Test Daily Calibrate per manufacturer recommendations
Hydrogen Sulfide: MultiRAE	Intrusive work	<1 ppm >1 ppm	Level D Stop work, implement engineering controls, if concentrations > 1ppm persist, contact HSM to determine appropriate path forward, including an upgrade in respiratory protection.	Initially and periodically during tasks	Bump Test Daily Calibrate per manufacturer recommendations
Carbon Monoxide: MultiRAE	ISTT operation (ambient) and use of combustion engines within Bldg.	<25 ppm >25 ppm	Level D Stop work, move to fresh air, contact HSM	Initially and periodically during tasks	Bump Test Daily Calibrate per manufacturer recommendations
Detector Tubes: Vinyl Chloride	Intrusive work, ISTT operation (ambient) Line breaking during ISTT operation Soil Sampling	0-1 ppm >1ppm	Level D Level C	Detections over 1 ppm on PID.	NA
Noise-Level Monitor: ^d	Inside ISTT Equipment trailer	<85 dB(A) 85-120 dB(A) 120 dB(A)	No action required Hearing protection required Stop; re-evaluate	Initially and periodically during task	Calibrate per manufacturer recommendations
Noise-Level Monitor: ^d Voice	All Tasks	Conversations can be held at distances of 3 feet without shouting Conversations cannot be held at a distances of 3 feet without shouting	No action required Hearing protection required	Continuous During Task	Not applicable
Dust Monitor: Visual	All Tasks	No Visible Dust Visible Airborne Dust	Level D Level D. Institute Dust Suppression Techniques	Continuous During Task	Not applicable

Instrument	Tasks	Action Levels ^a	Action to be Taken when Action Level reached	Frequency ^b	Calibration
NOTE: The GEM 2000 (or equivalent) may be used for H ₂ S, methane LEL, and O ₂ using the action levels listed above.					
Heat Stress Monitor - Refer to Flow Chart Below ☒ Ambient Temperature ☐ WBGT ☒ Heat Index ☒ Physiological ☒ Pulse ☒ Temperature	All Tasks	Refer to the Handbook for the type of monitoring conducted.	Refer to the Handbook for the type of monitoring conducted.	When Heat Index reaches criteria.	

^a Action levels apply to sustained breathing-zone measurements above background.

^b The exact frequency of monitoring depends on field conditions and is to be determined by the SL; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate.

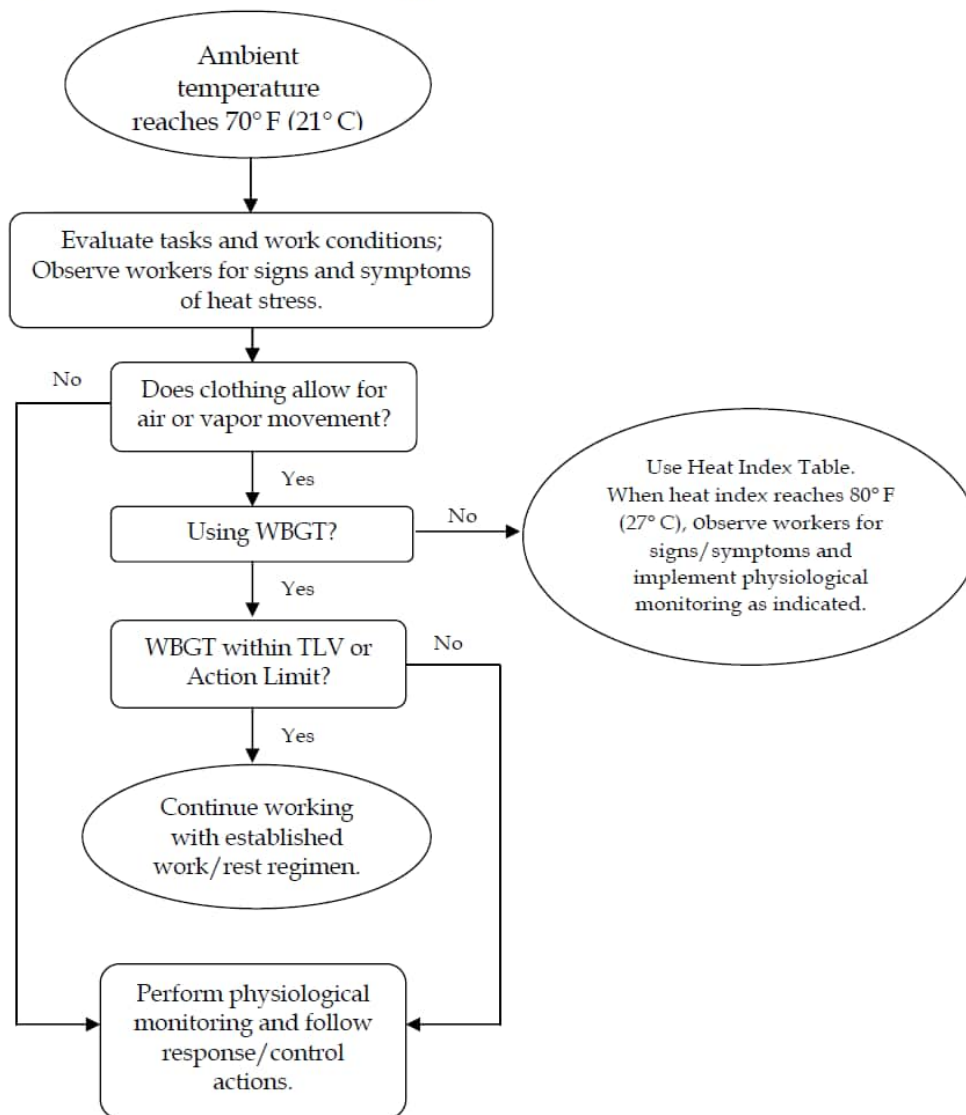
^c If the measured percent of O₂ is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O₂ action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O₂ action levels are required for confined-space entry.

^d Noise monitoring and audiometric testing also required.

11.2 Heat Stress Monitoring Flow Chart

Use the flow chart below and refer to the applicable protocol in Section 9 of the Handbook for heat stress monitoring.

Thermal Stress Monitoring Flow Chart



12. Personal Protective Equipment

12.1 Required Personal Protective Equipment (PPE)

(See P&PS Work Instruction, IB-HS-WI-0310-IB, Personal Protective Equipment Minimum Standards and IB-HS-WI-0310-US, PPE Guidance - USA))

PPE must be worn by employees when actual or potential hazards exist and engineering controls or administrative practices cannot adequately control those hazards.

A PPE assessment has been conducted by the HSM based on project tasks (see PPE specifications below). Verification and certification of assigned PPE by task is completed by the HSM that approved this plan. Refer to the Handbook, Section 11, "Personal Protective Equipment," for requirements on the use, care, and maintenance of PPE.

The table below outlines PPE to be used according to task based on project-specific hazard assessment. If a task other than the tasks described in this table needs to be performed, contact the HSM so this table can be updated. Task-specific PPE is also contained in task HIIRA for each task.

Ensure that all PPE is inspected prior to use and that you have been trained in its use. Ensure the PPE used fits properly. Contact the HSM if there are deficiencies or you haven't been trained on care, use, and limitations of PPE.

Table 5: PPE Requirements

Project-Specific Personal Protective Equipment Requirements ^a				
Task	Level	Body	Head	Respirator ^b
General field work outside in Support Zone All tasks under presumption that contact w/contaminated media will not occur	D	☒ Work clothes (sleeved shirt, long pants) ☒ Safety-toed Boots ☒ Gloves (leather) ☒ ANSI/ISEA 107-2010 high visibility vest	☒ ANSI Z89.1 Hardhat ^c ☒ ANSI Z87.1 Safety glasses ☒ Hearing protection ^d	None required
Drilling / Excavation ISTT Construction ISTT System Operation / Maintenance / Monitoring *Contact with contaminated media / vapors	Modified D	☒ Work clothes or ☒ Cotton coveralls ☒ ANSI/ISEA 107-2010 high visibility vest ☒ Safety-toed boots with outer rubber boot covers or ☒ Safety-toed rubber boots (can be deconned in a boot wash) ☒ Inner surgical-style nitrile ☒ Outer chemical-resistant nitrile/leather gloves. ☒ Other: Uncoated or polycoated Tyvek. SC to determine body protection based on potential contact	☒ ANSI Z89.1 Hardhat ^c ☒ ANSI Z87.1 Safety glasses ☒ Hearing protection ^d ☒ Face shield – within 10' of Hot Soil Sampling when cores are being removed	None required

Project-Specific Personal Protective Equipment Requirements ^a				
Task	Level	Body	Head	Respirator ^b
		with site contaminants. If outer layer of personal clothing cannot be kept clean, then outer cotton coveralls or uncoated Tyvek coveralls shall be worn. Polycoated Tyvek when there is potential to contact contaminated groundwater or free liquids from drums. ☒ Other (specify): Heat Rated gloves (ANSI level 3 minimum) for handling of steel sample liners / tooling during Hot Soil Sampling when temp is greater than 110 degrees Fahrenheit		
Equipment decontamination if using pressure washer	Modified D with splash protection	☒ Polycoated Tyvek® / rain suit ☒ ANSI/ISEA 107-2010 high visibility vest ☒ 16-inch-high safety-toed rubber boots (can be deconned in a boot wash) ☒ Inner surgical-style nitrile ☒ Outer chemical-resistant nitrile gloves. ☐ Other (specify):	☒ ANSI Z89.1 Hardhat ^c ☒ ANSI Z87.1 Safety glasses ☒ Hearing protection ^d ☒ Face shield	None required.
Reasons for Upgrading or Downgrading Level of Protection (with approval of the RHSM)				
Upgrade ^f		Downgrade		
- Request from individual performing tasks. - Change in work tasks that will increase contact or potential contact with hazardous materials. - Occurrence or likely occurrence of gas or vapor emission. - Known or suspected presence of dermal hazards. - Instrument action levels in the "Site Monitoring" section exceeded.		- New information indicating that situation is less hazardous than originally thought. - Change in site conditions that decrease the hazard. - Change in work task that will reduce contact with hazardous materials.		
^a Modifications are as indicated. Jacobs will provide PPE only to JACOBS employees. ^b No facial hair that would interfere with respirator fit is permitted. ^c Hardhat and splash-shield areas are to be determined by the SL. ^d Ear protection should be worn when conversations cannot be held at distances of 3 feet (1 meter) or less without shouting. ^e See cartridge change-out schedule. ^f Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the RHSM, and an SL qualified at that level is present.				

12.2 Respiratory Protection

(See P&PS Work Instruction, IB-HS-WI-0310-IB, Personal Protective Equipment Minimum Standards and IB-HS-WI-0310-US, PPE Guidance - USA)

Implement the following when using respiratory protection:

- Respirator use shall be limited to those activities identified in this plan. If site conditions change that alters the effectiveness of the specified respiratory protection, the HSM shall be notified to amend the written plan;
- Tight-fitting facepiece respirator users shall be clean-shaven and shall perform a user seal check before each use;
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SL or HSM of any detection of vapor or gas breakthrough. The SL shall report any breakthrough events to the HSM for schedule upgrade;
- Respirators in regular use shall be inspected before each use and during cleaning;
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition;
- Respirators shall be properly stored to protect against contamination and deformation;
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service; and
- The SL or designee shall complete the Self-Assessment Checklist – Respiratory Protection included in as attachment.

13. Worker Training and Qualification

13.1 Jacobs Worker Training

(See P&PS Work Instruction, IB-HS-WI-0200-IB; HSE Training and Competency)

The Project Manager shall ensure that all employees, including subcontractor employees, have the correct training, skills and experience to undertake the tasks they are engaged in. All project staff will have the necessary licenses to drive vehicles, operate equipment and undertake specialized work as required by law.

The following training is required for Jacobs personnel working onsite, in addition to their assigned worker category training (SLHW, HWW, HWWL). Copies of training will either be available onsite, or readily available from the Jacobs e3 Learning training database system. Refer to Section 12 of the Handbook for a description of HAZWOPER-related and Safety Liaison training.

Table 7: Jacobs Required Worker Training

Required Jacobs Worker Training (Worker Category)	Jacobs Task or Equipment-Specific Training (if Jacobs personnel performing task)
☒ 40-hour HAZWOPER Training	☐ Aerial Lift Operator Training
☒ 8-hour HAZWOPER Refresher	☐ Confined Space Entry Training
☒ 3-day HAZWOPER OJT	☒ Excavation Safety Training
☒ Jacobs PHSEP Review	☒ Fall Protection (site-specific)
☒ Jacobs F&ES HSE Field Handbook	☐ Forklift Operator
☒ Jacobs task HIIRA	☒ Hazard Communication
☒ Subcontractor PHSEP	☐ On-Track Railroad Safety Training (Rail Project Safety & On-Track Safety)
☒ 10-hour OSHA Construction Safety Training	☒ NFPA 70E Training (energized electrical safety training) (refer to worker category for all applicable training needed)
☒ At least one SLHW (refer to worker category for all applicable training needed)	☐ Qualified Earthmoving Equipment Operator
☒ First Aid/CPR/BBP – SL requirement	☐ Scaffold Training
☒ HWW (refer to worker category for all applicable training needed)	☒ ADT Driver Training/Jacobs Permit to Drive
☒ At least one SL-C (refer to worker category for all applicable training needed)	☐ Other (specify):
☐ Other (specify):	

Table 8: Project-Specific Required Training – Jacobs

☐ 3R Munitions Safety Awareness Training	☐ Ionizing Radiation Training
☐ Arsenic Training	☐ Lead Exposure Training
☒ Asbestos Awareness Training	☒ Lockout/Tagout Training
☐ Bear Awareness Training	☒ Manual Handling Training
☐ Benzene Training	☐ Methylene Chloride Training
☐ Cadmium Training	☒ Noise (Hearing Conservation)
☐ Cal-OSHA Heat Stress Illness Prevention Training	☒ NFPA 70E Awareness for Oversight of Work
☐ Confined Space Awareness Training	☒ ARC Flash (EETW Release of Victim)
☒ Drum Handling & Management Training	☒ Respiratory Protection (Level C) Training
☒ Electrical Safety Training	☐ Respiratory Protection (Level B) Training
☒ Excavation Safety Training	☒ Stairways and Ladders
☐ Working at Heights Awareness	☒ Working Adjacent to Live Traffic
☒ Globally Harmonized System Training (HazCom)	☒ Vinyl Chloride Training
☒ Hand Safety Training	☒ Waste Manifest Training
☐ Hydrogen Sulfide Hazard Recognition Training	☐ Other (specify)

Table 9: Dow Program Required Training – Specific to the Jacobs-Dow Program (applies to Legacy Sites only)

☒ Dow Program Charter	☒ Heavy Equipment
☒ Site Orientation	☐ Hot Work
☒ Safe Work Permit Issuer - General	☒ Hydroblasting/Pressure Washing
☐ Confined Space Entry (CSE)	☒ Isolation of Energy Sources (IOES)
☐ Electrical Safety – Elevated Work near Electrical Lines	☒ Line and Equipment Opening (LEO)
☐ Energized Electrical Work	☒ Procedure Use Policy
☐ Elevated Work/Fall Protection	

13.2 Subcontractor Worker Training

The following training is required for subcontractor personnel working onsite. Copies of training shall be available onsite.

Table 11: Subcontractor Required Worker Training

Required Subcontractor Worker Training	
☒ 40-hour HAZWOPER Training	☒ 10-hour OSHA Construction Safety Training
☒ 8-hour HAZWOPER Refresher	☐ 30-hour OSHA Construction Safety Training
☒ 8-hour HAZWOPER Supervisor	☒ Hazard Communication
☒ 3-day HAZWOPER OJT	☒ First Aid/CPR/BBP – at least 2 people
☒ Jacobs PHSEP Review	☒ Respiratory Protection Training
☒ Jacobs F&ES HSE Field Handbook	☒ Respirator Training, Medical and Fit Test
☒ Subcontractor SSoW (safety plan, task HIIRA,)	☒ Site-Specific Orientation and Training
☒ Subcontractor PHSEP	☐ Other
Subcontractor Task or Equipment-Specific Training (required if performing this work)	
☐ Aerial Lift Operator Training	☒ Ladder Safety Training
☐ Asbestos Competent Person	☐ Lead Training
☐ Asbestos Training (Supervisor, Worker)	☒ Lockout/Tagout Training
☐ Confined Space Entry Training	☐ On-Track Railroad Safety Training
☒ Certified Crane Operator	☒ NFPA 70E Training (energized electrical safety training)
☒ Crane Assembly/Disassembly Competent Person	☒ Qualified Drill Rig Operator
☒ Excavation Competent Person	☒ Qualified Earthmoving Equipment Operator
☐ Demolition Competent Person	☒ Qualified Rigger
☐ Fall Protection (site-specific)	☒ Qualified Crane Signaler
☐ Flagger Training	☐ Scaffold Training
☒ Forklift Operator	☐ Other

13.3 HAZWOPER-Exempted Tasks

See section 5.5 (may need to refer to table) with a list of task which are HAZWOPER-exempt

In general, the regulation doesn't apply if:

- Workers work exclusively within uncontaminated areas of the hazardous waste site,
- Do not enter areas where hazardous waste may exist, are stored or are processed, and
- Are not exposed to health or safety hazards related to hazardous waste operations.

Note – tasks below must meet all three bulleted items above.

Task	Task
General site work that does not involve contact with or exposure to contaminated media / vapors	

14. Medical Surveillance and Qualification

The following medical surveillance is required for Jacobs and subcontractor personnel working onsite. Copies of physician's medical opinion will either be available onsite, or for Jacobs staff, readily available from the Jacobs Learning Management System database. Refer to Section 13 of the Handbook for a description of HAZWOPER, respirator user, and hearing conservation medical surveillance.

Table 13: Medical Surveillance Requirements

General Required Medical Surveillance	Job or Activity-Specific Medical Surveillance (required if performing this work)
☒ HAZWOPER Medical Clearance	☒ Noise
☒ Respirator Medical Clearance	☐ Baseline Blood Lead
	☐ Asbestos Medical Clearance
	☐ Other (specify):

Personnel or Tasks Not Requiring Medical Surveillance	
General site work that does not involve contact with or exposure to contaminated media / vapors	

15. Site Control Plan

Site control is established to prevent the spread of contamination throughout the site and to ensure that only authorized individuals are permitted into potentially hazardous areas. Task-specific control measures are listed below. Use of the Buddy System will be implemented unless a Working Alone protocol has been established and approved. See section 14 of the Handbook.

Site Control for General Work Area(s)			
☒ Perimeter fencing	Location: Around work area.	☒ Barricades	Location: As needed around work area.
☒ Signage	Location: As needed around work area.	☐ Other: _____	Location:
☐ Traffic control devices	Location:	☐ Other: _____	Location:

Location	Site Control Procedure (discuss important elements such as signs, barricades, briefings, qualifications, required supplies and equipment, sign-in/out logs, etc.)
Support Zone	The SZ is an uncontaminated area (trailers, offices, field vehicles, etc.) that will serve as the field support area for most operations. The SZ provides field team communications and staging for emergency response. Appropriate sanitary facilities and safety and emergency response equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged and decontaminated materials, or personnel with medical emergencies that cannot be decontaminated.
Contamination Reduction Zone	The CRZ is established between the EZ and the SZ, upwind of the contaminated area where possible. The CRZ provides an area for decontamination of personnel, portable handheld equipment and tools, and heavy equipment. In addition, the CRZ serves as access for heavy equipment and emergency support services.
Exclusion Zone	The EZ is where activities take place that may involve exposure to site contaminants and/or hazardous materials or conditions. This zone shall be demarcated to prevent unauthorized entry. More than one EZ may be established if there are different levels of protection to be employed or different hazards that exist in the same work area. The EZ shall be large enough to allow adequate space for the activity to be completed, including field personnel and equipment, as well as necessary emergency equipment. The EZ shall be demarcated with some form of physical barrier or signage. The physical barrier or signage shall be placed so that they are visible to personnel approaching or working in the area. Barriers and boundary markers shall be removed when no longer needed.

16. Decontamination

Refer to the Handbook, Section 15, "Decontamination," for a complete description of decontamination activities and diagrams of typical decontamination areas. Decontamination areas will be established for work in potentially contaminated areas to prevent the spread of contamination. Decontamination areas should be located upwind of the exclusion zone where possible and should consider any adjacent or nearby projects and personnel. No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones.

All contaminated material generated through the personnel and equipment decontamination processes (e.g., contaminated disposable items, gross debris, liquids, sludges) will be properly containerized and labeled, stored at a secure location, and disposed in accordance with project plans.

Type of Decon	Activity	Equipment	Process/Protocol
Personnel	When dealing with contaminated media	☐ Tubs/brushes for boot/glove wash ☐ Solids disposal bag or drum (used PPE) ☐ Liquid disposal drum (decon water)	☐ Boot wash/rinse ☒ PPE disposal (no additional decon) ☐ PPE waste area identified ☐ Other: _____
Equipment	When dealing with contaminated media	☒ Table for equipment decon/staging ☐ Decon pad for vehicles ☒ Pressure Washer ☒ PPE used during decon ☒ Decon supplies (brushes, brooms) ☒ Containers/method to capture decon water and or sludge	☐ Equipment wiped/cleaned before leaving CRZ ☐ Vehicle tires dry deconned prior to leaving site ☐ Vehicle tires washed prior to leaving site ☐ Other: _____

16.1 Decontamination During Medical Emergencies

Standard personnel decontamination practices will be followed whenever possible. For emergency lifesaving first aid and/or medical treatment, normal decontamination procedures may need to be abbreviated or omitted. In this situation, site personnel shall accompany contaminated victims to advise emergency response personnel on potential contamination present and proper decontamination procedures.

Outer garments may be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Protective clothing can be cut away. If the outer garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances or medical personnel. Outer garments can then be removed at the medical facility.

17. Communications

A primary and backup means of communication for field crews have been established as described below:

Type of Communication	Primary Means	Backup Means
Communication between field crew	☒ Voice ☐ Radio ☐ Phone	☐ Voice ☐ Radio ☒ Phone
Communication with Office crew	☐ Radio ☒ Phone	☐ Radio ☒ Phone
Communication with Fire and Emergency Services	☐ Radio ☒ Phone	☐ Radio ☒ Phone

18. Required Facilities and Equipment

(See P&PS Procedure, IB-HS-PR-0600-IB, Health and Well Being)

The following facilities and equipment are required and used for safe completion of work:

Facility	Type	Location
☐ Worker Showers/lockers	(i.e., shower trailer, client facility, etc.)	
☒ Restrooms	Facility Portable	Treatment Building Outside Work Trailer
☒ Hand washing facility/hand sanitizer	Facility Portable	Treatment Building Outside Work Trailer
☐ Supplementary Illumination		
☒ Emergency Eyewash	Portable	Work Trailer Field Vehicle Treatment Building
☐ Emergency Shower		
☒ First aid kit/supplies	Portable	Work Trailer Field Vehicle Treatment Building
☒ Fire extinguishers	ABC	ISTT System Work Trailer Field Vehicle Treatment Building
☒ Spill Kit(s)	Universal	Stored At Site Next to Work Area
☒ Potable Water	Bottled	Cooler on Site
☒ Shade/rest area	Portable	Canopy next to work area Work Trailer
☒ Heated rest area	Portable	Work Trailer Field Vehicle Treatment Building
☐ Other _____		

19. Emergency Response Plan

Personnel responsible for coordinating emergency situations during site activity are identified below. The Emergency Contacts Page and a site map showing assembly points and directions to the authorized medical facility is at the front of this plan. Documented rehearsal and critique of this plan is required at least once during the task, or more often as necessary.

Responsibility	Name	Phone Number(s)
Emergency Response Coordinator (ERC)	Benjamin Hendry	315.806.4029
Alternate ERC	Sawyer Fallin-Hornsberger	508.542.6975
	Max Newton	413.345.0024
Type (desk or field) and frequency of rehearsal	Field	

If an emergency situation develops which requires evacuation of the work area, the following steps shall be implemented.

Evacuation Step	Methods and comments:
Notify affected workers	Use voice or cell phone to notify team of the event
Evacuate to safe location	Use field vehicles (if safe to do so) to move to safe location
Assemble and account for workers	Use Safety Briefing form (or SWP) to conduct headcount; use cell phone to communicate with team members in a different location if necessary
Notify Supervisor/Manager	Use cell phone to notify PM and EM or HSM
Complete incident report	EM or HSM to enter the incident into the Intelix System. Assistance from the PM and SL for details and the investigation.

Potential emergency situations and response actions are identified below.

In case of:	Response actions:
Injury or illness	Major Medical: FA/CPR trained personnel respond. If additional response required, contact local emergency responders and 911. Have a designee assist with guiding ambulance service to site if needed. If Jacobs P&PS employee, call WorkCare at 888-449-7787. Minor Medical: FA/CPR trained personnel respond. If Jacobs P&PS employee, call WorkCare at 888-449-7787. Transport to occupational health clinic if advised to do so.
Chemical exposure	Decon affected employee, seek medical treatment if necessary. Utilize eyewash and shower if needed. If additional response required, contact local emergency responders. If Jacobs P&PS employee, call WorkCare at 888-449-7787,
Fire or explosion	Evacuate site to designated location, call 911. Provide necessary first aid, seek treatment if necessary. For small fires, only respond to trash can size fires with site fire extinguishers.
Adverse weather	Shut down work; rally to nearest structure.

Heat Stroke	Call 911, have a designee give location and directions to ambulance service if needed. If Jacobs P&PS employee, call WorkCare at 888-449-7787.
Material spill or release	Appropriate spill response materials for all chemicals must be present at the job site. Only qualified (by training and previous experience) who have proper PPE and equipment available shall provide spill response operations, when safe to do so. Immediately identify the character, exact source, amount, and areal extent of any released materials, if safe to do so.
Active Shooter	Have a plan when working on client premises—look for at least 2 evacuation routes/points. Program emergency numbers in your phone (client emergency service numbers, HSM, PM, Supervisor, WorkCare, US Security Officer, Keith Waddell (214-920-8327). If an active shooter is on the premises follow Run, Hide, Fight: • Run: Leave belonging behind. Try to get out of the building or danger area if possible using exits. Call 911 when in a safe area and then call Keith Waddell, Security, PM and HSM. • Hide: Act quickly - Find a place, closet or office, or something to hide behind out of the vision of shooter. Lock or barricade or otherwise secure the spot if possible. Turn off lights, silence cell phones. Stay calm and quiet • Fight: Last resort! If your life is at risk—work alone as or as a group. Use improvised weapons, act aggressively, disarm or injure the shooter, commit to your actions. When law enforcement arrives – stay calm—show hands, spreading fingers. Avoid sudden movements, yelling or pointing. Allow law enforcement to do their job to control the area. Their first priority is finding the shooter. Once you are safe – be sure to notify your supervisor, the PM, and HSM of your status. The PM/Supervisor shall follow the incident reporting process, including notification in accordance with the incident reporting flowchart. HSM will complete an Intellex report.

Evacuation Signals:	Meaning:
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

In the event of a large quantity spill notify emergency services. Personnel discovering a spill shall (only if safe to do so):

- Stop or contain the spill immediately (if possible) or note source. Shut off the source (e.g., pump, treatment system) if possible. If unsafe conditions exist, then leave the area, call emergency services, inform nearby personnel, notify the site supervisors, and initiate incident reporting process. The SL shall be notified immediately;
- Extinguish sources of ignition (flames, sparks, hot surfaces, cigarettes);
- Clear personnel from the spill location and barricade the area;
- Use available spill control equipment in an effort to ensure that fires, explosions, and releases do not occur, recur, or spread;
- Use sorbent materials to control the spill at the source;
- Construct a temporary containment dike of sorbent materials, cinder blocks, bricks or other suitable materials to help contain the spill;
- Attempt to identify the character, exact source, amount, and extent of the released materials. Identification of the spilled material should be made as soon as possible so that the appropriate cleanup procedure can be identified;
- Keep incompatible wastes separate from spilled materials area until spill cleanup is complete;
- Contact the HSM and project EM in the event of a spill or release immediately so evaluation of reportable quantity requirements and whether agency reporting is required;
- Assess possible hazards to human health or the environment as a result of the release, fire or explosion, including the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions;
- Make arrangements to manage and dispose of spilled materials and used spill control materials appropriately;
- Replace spill control materials and decontaminate/clean spill control equipment (if needed) that were used in the response; and Follow incident notification, reporting, and investigation section of this plan.

20. Incident Notification, Reporting, and Investigation

(See P&PS Work Instruction IB-HS-WI-0400-IB, P&PS Incident Reporting and Investigation)

20.1 Incident Notification

All employees and subcontractors' employees shall immediately report any incident (including "near misses,") in which they are involved or witness to their supervisor.

The Jacobs or subcontractor supervisor, upon receiving an incident report, shall inform his immediate supervisor and the Jacobs SL. The SL shall make notifications to the PM and the EM or HSM as soon as reasonably possible. The PM and the EM or HSM will make additional notifications; **some clients require notification of an incident in less than 2 hours of the event.** See the Dow incident notification flowchart at the end of this section.

The SL shall immediately verbally report the following information to the HSM and PM by phone and e-mail (an initial incident notification form is available):

- Project Name and Site Manager;
- Date and time of incident;
- Description of incident;
- Extent of known injuries or damage;
- Level of medical attention; and
- Preliminary root cause/corrective actions

If the incident was an environmental permit issue (potential permit non-compliance, other situation that result in a notice of violation) or a spill or release, contact the Project EM immediately so they can evaluate reportable quantity requirements and if subsequent agency notification is required.

In critical emergency situations (medical, natural disaster, security, civil unrest, etc.), the local emergency responders listed on the Emergency Contact Page should be the initial point of contact. If necessary, the HSM or PM may reach out to the Jacobs 24-hour Global Assistance and Response Hotline (+1-443-221-6281) for supplementary assistance.

The EM or RHSM will be notified to conduct and complete the investigation (with the assistance of the Program EHS Manager) within days and update the Intelex report. The PM and SL, as a minimum, may be asked to assist with the investigation.

20.2 Intelex and Incident Report Form

The HSM or EM shall complete an entry into the Intelex system located on JacobsConnect.. The SL shall summarize or use the P&PS Initial Incident Notification form and forward it to the HSM within 24 hours.

20.2.1 Determine the Actual Severity and Worst Potential Severity

When determining the Actual Severity and Worst Potential Severity of an incident to be included in the Intelex Report, use the severity tables in the Handbook.

20.3 WorkCare Injury Management and Return to Work (for U.S./Puerto Rico-based P&PS Jacobs Staff Only)

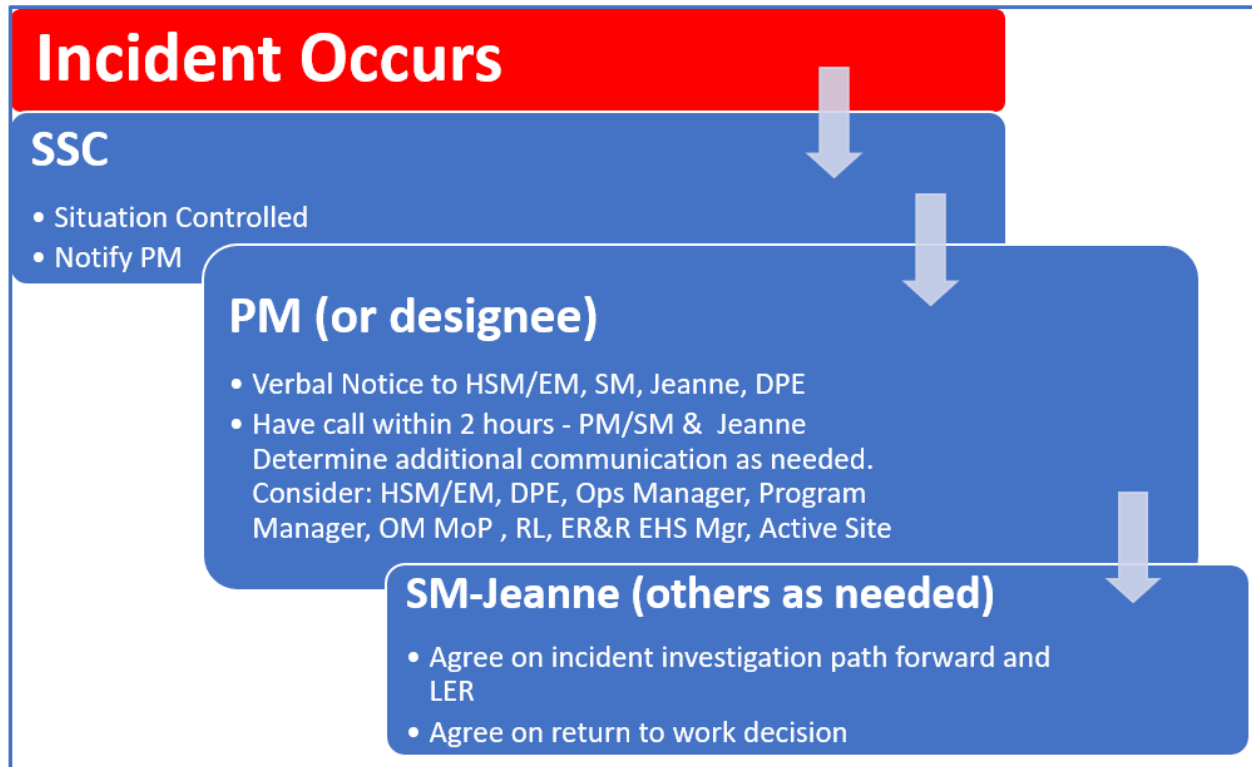
In the event of an injury, or potential injury (i.e., involvement in motor vehicle collision with no apparent injury; a puncture wound with no bleeding or apparent infection, etc.), the following actions shall be taken:

- Employee informs their supervisor.
- Employee calls the Injury Management Program toll free number 1-888-449-7787 immediately and speaks with the Occupational Injury Nurse. This number is operable 24 hours per day, 7 days a week. **Employees are encouraged to enter this phone number into their cell phones prior to starting field work.**
- Supervisor ensures employee immediately calls the Injury Management Program number. Supervisor makes the call with the injured worker or for the injured worker, if needed.
- Nurse assists employee with obtaining appropriate medical treatment, as necessary schedules clinic visit for employee (calls ahead, and assists with any necessary follow up treatment). The supervisor or SL accompanies the employee if a clinic visit is necessary to ensure that employees receive appropriate and timely care.
- SL or designee shall verbally notify the HSM and PM. The SL or designee may use the hardcopy Incident Report attached to this plan to forward to the HSM for Intelex entry. HSM completes the Intelex entry within 24 hours.
- Nurse notifies appropriate Jacobs staff by e-mail (supervisor, Health & Safety, Human Resources, Workers' Compensation).
- Nurse communicates and coordinates with and for employee on treatment through recovery.
- Supervisor and/or PM ensures suitable duties are identified and available for injured or ill workers who are determined to be medically fit to return to work on transitional duty (temporary and progressive).
- Supervisor and/or PM ensures medical limitations prescribed (if any) by physician are followed until the worker is released to full duty.

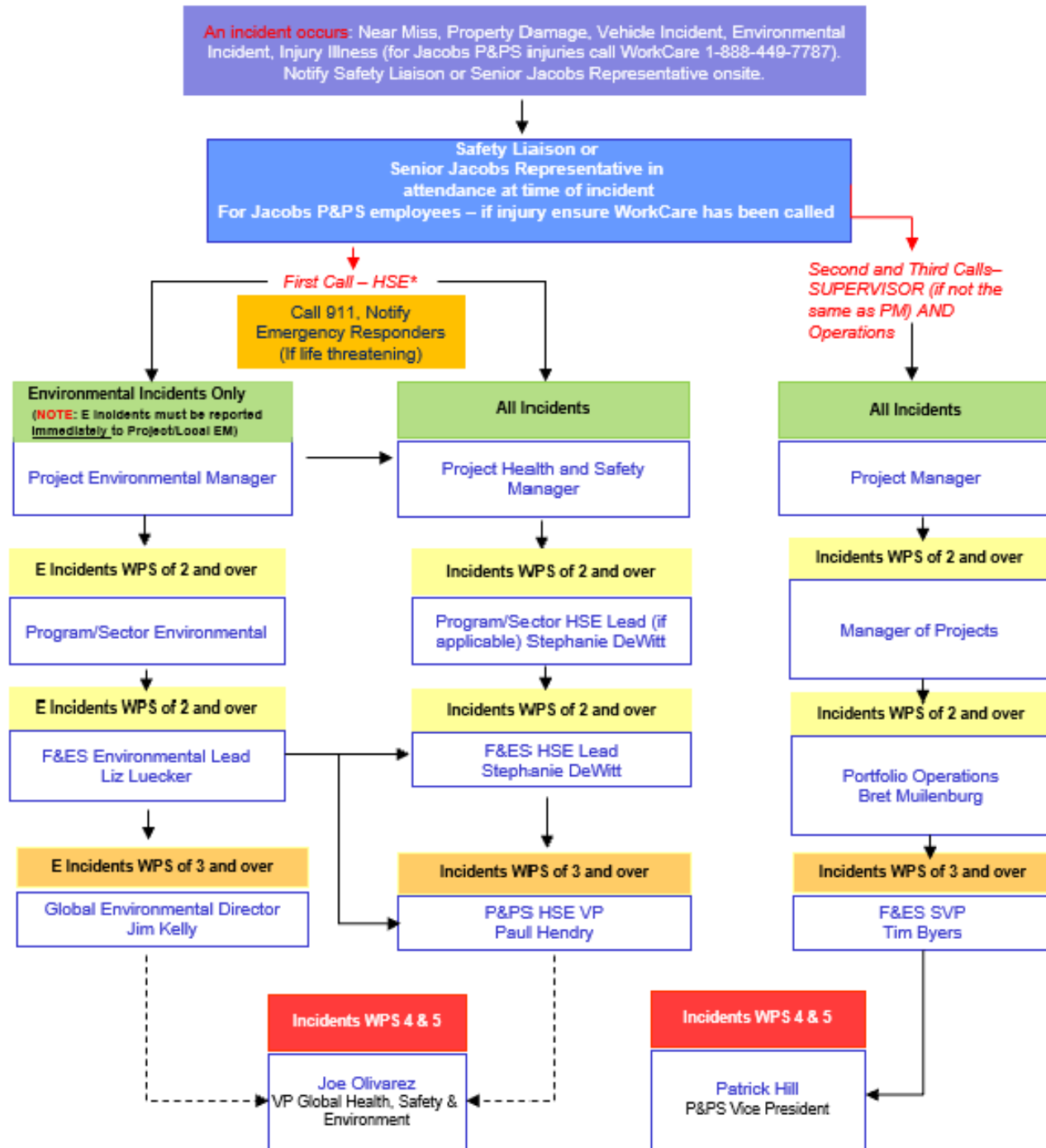
Verbal incident notification is made to both the HSE and the Operations chains to the indicated group depending on the severity, and any project, geographic, or client specific notification and reporting requirements as shown in the flowchart below (Also refer to P&PS Work Instruction IB-HS-WI-0400-IB, Incident Reporting and Investigation). The HSM will complete an Intelex report.

Dow Incident Notification

Follow the flowchart below for incident notification for Dow Projects



Jacobs F&ES Verbal Chain for Reporting all Field Incidents



* First call HSE – If the incident is an environmental incident, immediately (within 15 minutes) call the EM to ensure timely reporting to external agencies, if necessary. If any other type of incident, call the HSM as the first call.

Notes:

1. Worst Potential Severity (WPS) definitions are to be found in Global Work Instruction JJ-HS-WI-0400-JJ, HSE&S Incident Mngm.
2. Actual 4 and 5 must be communicated to Legal and Communications by the HSE VP or GVP
3. All incidents involving Jacobs employees or a subcontractor under Jacobs control (including motor vehicle accidents, injuries, environmental incidents and near-misses) shall be reported as soon as possible **in person or by telephone**.
4. If your Project Manager is not your Line Manager, it is essential that a call is made to both.
5. Calls must be made to both the relevant HSE and operations chains. These are not alternatives.
6. Security and Sustainability Directors / VP's will be notified where appropriate by HSE&S VP / HSE VP
7. Where required by legislation, a Jacobs HSE&S Manager will make the necessary report to the enforcing authorities.

Project Health, Safety and Environment Plan

20.4 Drug and Alcohol Free Workplace

(See Jacobs Human Resource Policy PL-EB-PL-6830-PL, Drug and Alcohol-Free Workplace)

All employees, subcontractors, and other employed individuals are expected to arrive at work fit to carry out their jobs and to be able to perform duties safely without any limitations due to the use or after effects of alcohol or drugs (whether prescribed, over the counter, or illegal).

It is forbidden to be present at the workplace after consuming alcohol or drugs and/or possess and/or consume alcohol or drugs at the workplace. Signing documents such as Safety Briefing Form, SWP, etc. indicates that you are verifying you are fit to work. Any employee or subcontractor who violates these rules will not be permitted to work. Immediate supervisors are responsible for monitoring adherence to the policy.

When an employee, subcontractor or employed individual arrives at work or during the workday and a supervisor reasonably believes that they are under the influence of alcohol or drugs, the supervisor must immediately contact Human Resources in order that the person can be provided with assistance and an investigation can be undertaken.

20.5 Post-Incident Drug Testing Requirements

(See Jacobs Human Resource Procedures US-EB-PR-6830-US, Drug and Alcohol-Free Workplace Testing, Searches and Inspection)

Post-Incident Drug and Alcohol testing may be initiated by the employee supervisor, Human Resources and/or Drug and Alcohol-Free Workplace Program Administrator (DAFWPA) when any of the following occur:

- An employee experiences a work-related injury on or in Company Property/Workplace with a Worst Potential Severity of 3 (WPS 3), or greater, as described in JJ-HS-WI-0400-JJ, HSE&S Incident Management, in which the Company reasonably believes (under the reasonable suspicion provisions and processes in the reference procedure (US-EB-PR-6830)) that drug and/or alcohol use is a contributing factor.
- An employee experiences an incident resulting in property damage where the Company reasonably believes the damages are rated at least a WPS 3, resulting in a cost of over US\$30,000 or greater and/or where the employee is alleged to be at fault for causing the incident.
- Any incident with a WPS 3 or greater on or in Company property/workplace (to an employee or any third parties) involving the employee's use and operation of any heavy machinery and/or where the employee is alleged to be at fault for causing the Incident leading to injury while operating a motor vehicle or equipment.
- Any work-related incident involving an employee considered to be a serious near miss event rated at least a WPS 3 that occurs in the field or in the office as reasonably determined by the Company and where the Company reasonably believes (under and following the reasonable suspicion provisions and processes in this Procedure) that drug and/or alcohol use by the employee is a contributing factor to the serious near miss.
- Other circumstances as may be appropriate, as determined by management and HR, in consultation with the DAFWPA (and Legal, as necessary).

21. Inspections, Observations, and Leadership Engagement

21.1 Inspections and Audits

Various types of inspections may be conducted, including Leadership HSE Site Visits, project activity self-assessments, Safe Behavior Observations, Agency inspections, and operational project reviews.

21.1.1 HSE Site Inspection Reports

The HSE Site Inspection Report shall be performed monthly by the PM or designee. It is available as an attachment to this plan or can be filled out electronically through the Intelix Audit Module (also available on mobile devices). If using a hard copy form, be sure to keep with the project files. Notify the HSM or EM of any findings.

21.1.2 Leadership Engagement/Site Visits

The Leadership Engagement/Site Visits form is intended to facilitate PM leadership, to provide an opportunity for PMs to mentor field staff on HSE, and to identify any big picture actions that need to be addressed. This does not take the place of a formal HSE audit. The project PM and Managers of Project (or their designees) will conduct a minimum of 4 Leadership Engagement sessions or Site Walks to the project every year. The form can be accessed on the Intelix database on JacobsConnect. The Leadership Engagement session or Site Walk will be documented using the Leadership Engagement tool in the Intelix Beyond Zero Observation Module. Contact your HSM if you need directions for completing the form and copy your HSM on your submittal. Examples of Leadership Engagement include leading the subcontractor chartering call, engaging with project team on matters of HSE, performing a site visit/walk to observe HSE at the project, completing a HSE Site Inspection Report, holding an HSE Stand-Down, etc.

21.1.3 Environmental Inspections

Additional environmental inspections may be required based on the scope of the project. These can include weekly hazardous waste container inspections, daily hazardous waste tank inspections, monthly oil Spill Prevention Control and Countermeasures (SPCC) inspections, and routine stormwater inspections. **Contact your Environmental Manager to determine what environmental inspections may be needed.** A separate plan (e.g., waste management, environmental, spill plan) may be appropriate and may include environmental inspection checklists; such a plan can be referenced in this section.

21.1.4 HSE Audits

HSE project audits will be determined and scheduled based on the risk profile of the project and input from the LOB or Regional BU HSE Lead. The Dow Program Project Audit Plan may be populated in the Intelix Audit Module and the Dow Program Audit Plan. Audit findings will be entered into the Audit Module (Intelix) and the Jacobs-Dow Program CATS database and findings tracked to completion.

Project Health, Safety and Environment Plan

21.2 Project Activity Self-Assessment Checklists

The following self-assessment checklists are required when the task or exposure is initiated and weekly thereafter. The checklists shall be completed by the SL or other Jacobs representative and maintained in project files.

Hand and Power Tools PPE Manual Lifting	All Tasks	Initially when these task are conducting during the project
Drilling	Drilling Activities	Initially when drilling is conducted during the project
Vehicle / Equipment Spotting PTHA Card	Backing/Spotting Heavy Equipment Operation	For daily routine backing task, this document will be reviewed weekly. The spotter reviews with new driver bringing in fill dirt/gravel.
LCS-Electrical Safety	ISTT Installation Routine System Maintenance	Prior to initially accessing the electrical panel
LCS- Heavy Equipment	Heavy Equipment Operation	Prior to conducting heavy equipment operation
LCS-Hydroblasting-Pressure Washing (HBPW)	ISTT Installation	Initially when pressure washing is conducted during the project
LCS-Isolation of Ener Sources (IOES)	Routine System Maintenance	Prior to conducting Isolation of Equipment
LCS-Line and Equipment Opening (LEO)	Routine System Maintenance	Prior to conducting Isolation of Equipment involving LEO

21.3 Safe Behavior Observations

On the Dow Program, Safe Behavior Observations (SBOs) will be used. Project team members will complete SBOs using the EHSBO App on OMNI using their phone, a tablet or laptop computer. SBOs will be completed by the project team at a frequency of a minimum of 1 / 100 hours worked unless additional opportunities arise, or they are required by a subcontractor exception. The SBO will be reviewed, and interventions/observations may be entered in the Beyond Zero Observation (BZO) database on behalf of the Project Team by the reviewer.

Do not enter BZOs into the database, use the EHSBO App.

SBOs are a tool:

- That can be used for both a planned observation of behaviors or conditions in the work area;
- For improving leadership, workforce behaviors, and peer to peer communication;
- To provide positive reinforcement, correct unsafe behaviors or unsafe conditions; and
- To document something you witness outside of work hours that others can learn from.
- Not a method for reporting a near miss, or incident

Project Health, Safety and Environment Plan

21.4 Beyond Zero Observations

(Reference Jacobs Business Management System Work Instruction, JJ-HS-WI-0306-JJ, BeyondZero Observations)

BZOs are a required element of our BeyondZero Culture of Caring for Jacobs. As stated in the previous section, **The Dow Program does not use the BZO system directly** but uses the SBO app to record observations. Observations may be entered into the BZO system on behalf of the Project Team by the reviewer.

21.5 Agency Inspections

If a Federal or local agency (e.g., OSHA, local water board, EPA, Department of Environmental Quality, Ministry Of Labour) announces it will be performing inspection, either announced or unannounced, refer to the Agency Inspections document. Contact the PM, HSM and EM as soon as you receive notice.

21.6 LCS Audit Protocol

When conducting an audit of a Dow Legacy Site, if the project work includes LCS elements, the audit protocols will be used to ensure all required elements are included and being conducted as required.

Confined Space Entry Policy	Hydroblasting Pressure Washing Policy
Energized Electrical Safety	Isolation of Energy Sources (IOES)
Elevated Work Policy	Line and Equipment Opening (LEO)
Heavy Equipment Policy	Procedure Use Policy
Hot Work Policy	Safe Work Permit Policy

22. Records and Reports

Refer to the Handbook, Section 19, "Records and Reports," for a complete description of HSE recordkeeping requirements.

23. PHSEP Induction Record

EMPLOYEE SIGNOFF FORM

By signing below, I have been instructed by the Project Manager (or their designee) in the following HSE requirements:

- Project HSE Plan
- Safe Work Methods
- General Workplace Hazards and Controls.
- I have been trained in the use of PPE
- I am aware of the project emergency procedure requirements.
- I have been introduced to the scope of work and general work locations
- I have completed an orientation of my work area with my supervisor

Project Name: Dow Jamestown ISTT Construction/Operation

Project Number: JMS018DW

EMPLOYEE NAME (Please print)	EMPLOYEE SIGNATURE	COMPANY	DATE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Resources, Region 9

700 Delaware Avenue, Buffalo, NY 14209

P: (716) 851-7130 | F: (716) 851-7009

www.dec.ny.gov

May 15, 2023

VIA EMAIL ONLY

Garrett Hazebrouck
Jacobs Project Manager
120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

Dear Garrett Hazebrouck:

In-Situ Thermal Treatment Air Emissions Essex-Hope State Superfund Site Jamestown, NY, Site #907015

The New York State Department of Environmental Conservation (DEC) has reviewed Jacob's January 26, 2023 reply to DEC's December 7, 2022 request for more information about the proposed In-Situ Thermal Treatment Remediation for the Essex-Hope Site in Jamestown, NY (Site #907015).

The emission calculations are based off experience and modeling of soil and groundwater data, so the actual values are expected vary from those provided. Treating the emissions with the proposed vapor phase activated carbon (VGAC) treatment system will meet the *Guidance on Air Emissions of VOCs at DER Remediation Sites*. After controls, all the emissions are less than 50% of the emission thresholds in the guidance.

Monitoring and recording the VOC content in the exhaust stream after each VGAC vessels, as explained in your January 26, 2023 letter, will ensure that the emission control system is operating properly and in compliance with the guidance. The monitoring records must be made available to DEC staff upon request and a submission schedule included in the Construction Design Documents.

Garrett Hazebrouck
May 15, 2023
Page 2

You may direct any questions to me at 716-851-7130, michael.emery@dec.ny.gov, or to Joshua Vaccaro, the DER Project Manager, at 716-851-7220, joshua.vaccaro@dec.ny.gov.

Sincerely,

Michael Emery, P.E.
Regional Engineer

ME

cc : Joshua Vaccaro, Project Manager, NYSDEC Region 9
Audrey Sidebottom, Remediation Leader, Dow
Brian Carling, Site Manager, Jacobs

4.3 Treatment System

Multiphase extraction will be driven by vacuum blowers (see drawing PFD-01 in Appendix B) and will be controlled via variable frequency drives. A butterfly valve and manual dilution air intake adjustment will allow control of the well field vacuum relative to that of the treatment system. The total extraction rate of cooled and dried vapors will be monitored at the discharge point using a pitot tube. Liquid extraction will be controlled by setting the compressed air solenoid triggering timers powering double diaphragm pumps. The total liquid extraction rate will be monitored at the treatment system using a totalizers, accounting for water reused during backwashing.

In addition to the compressed air solenoids, each extraction well has ball valves that can be used to adjust individual rates of vapor extraction, liquid extraction, and compressed air delivery. Individual vapor extraction rates can be monitored by installing a portable pitot tube assembly in the well extraction, and individual liquid extraction rates can be monitored by temporarily installing a portable knockout assembly in-line. Temperature, vacuum, and photoionization detector (PID) readings will also be collected manually at the extraction wells to inform their operation.

The treatment system will process two fluid streams: extracted vapors and non condensable gases; and extracted groundwater, condensate, and NAPLs if present. Please refer to Figure PFD-01 in Appendix B for a process flow diagram of the system with liquid flows (19.9 GPM), vapor flows (360 SCFM), liquid carbon media requirements (500 pounds × 3 vessels), vapor carbon media requirements (5,000 pounds × 2 vessels), and contingency potassium permanganate for VC treatment (3,750 pounds).

4.3.1 Vapor Treatment

Downstream of the initial moisture separator (MS-001), effluent vapors are passed through a shell and tube heat exchanger (HEX-101) fed by a 125-ton cooling tower (TOW-1301). Next, the cooled vapors are fed through an additional moisture separator (MS-002) to remove additional condensate. The effluent vapors are passed through a shell and tube heat exchanger (HEX-104) using a 50% propylene glycol/50% water mixture tied to a chiller (CH-201). Cooled vapors will then pass through the final knockout stage (MS-003) to remove additional condensate. Vapors will pass under vacuum to the dual vacuum blowers (BL-701 and BL-702). Dilution air may be introduced upstream of the blowers if necessary.

Vapors will heat up as they pass through the blowers, so an additional cooling step will take place before carbon treatment. Vapors will pass through a fin-fan heat exchanger (HEX-103) and join with off-gas from the air stripper (AS-601). Two 5,000-pound sacrificial vapor phase granular activated carbon (VGAC) vessels (VG-801A or VG-801B followed by VG-802 A or VG-802 B) connected in series will be used to capture vapor contaminants. Finally, vapors will pass through a potassium permanganate media filled vessel (Z-901 or Z-902) for treatment of vinyl chloride if necessary. Treated vapors will be discharged to the atmosphere using a booster blower (BL-704-110) through a stack (SK-111).

4.3.2 Liquid Treatment

Extracted fluids will be transferred via the multiphase well field piping network to an initial moisture separation tank (MS-001). To reduce the potential for fouling of the liquid treatment system components, MS-001 is a cone-bottom tank allowing extracted solids (sludge) to accumulate at the base of the tank. The sludge will then be pumped via a double diaphragm pump (P-303) to the sludge settling tank (T-501). Sludge will then be further dewatered through a sludge filter and stored in a drum (SD-304). Water will be decanted from both T-501 and SD-304 by pumps P-306 and P-305, respectively. These liquid streams will join the water separated from MS-002 and MS-003 and enter the oil water separator (OWS-401).

If present, light non-aqueous phase liquid recovered by system operation which accumulate in the OWS will be skimmed off the top and dense non-aqueous phase liquids (DNAPLs) will be decanted from the bottom sump into T-503 and T-504, respectively. The recovered water will be pumped to an air stripper (AS-601) to volatilize contaminants dissolved in the liquid stream. The remaining water will pass through a series of double bag filters (BF-1001A/B and BF-1002A/B) to remove particulates in advance of the liquid carbon treatment.

Three 500-pound sacrificial liquid phase granular activated carbon (LGAC) vessels (LGAC-1101, LGAC-1102, and LGAC-1103) will be used to further reduce dissolved contaminant concentrations in water. Treated water from the treated water holding tank (T-505) will be used for backwashing LGAC and potentially for reinjection at the ET-DSPTM electrodes. Excess treated water will be discharged to the existing discharge point under a permit from Jamestown BPU.

4.3.3 Ancillary Equipment

A glycol chiller (CH-201) with a centrifugal transfer pump, will be used to supply refrigerated glycol to shell and tube heat exchangers HEX-104. It will be outfitted with a glycol supply tank and temperature and pressure gauges to monitor heat transfer and flow. A continuous duty air compressor (AC-400) will be used to operate the well field slurper tubes and the double-diaphragm transfer pumps. It is equipped with a receiver tank with pressure relief valve and pressure regulators for each of the individual service lines (that is, slurpers and double-diaphragm pumps).



Monitoring Well

Site Boundary

Chautauqua County Tax Parcels

N

BASE MAP SOURCE:
Imagery: Statewide Digital Orthoimagery 2016 of
Chautauqua County, New York Stat Gov 2016;
Tax Parcel Source: Chautauqua County
Department of Information Services. Last updated
July 7th, 2017.

06.2512.525

Scale in Feet

Essex Specialty
Products, Inc

Essex/Hope Site,
Jamestown, New York

FIGURE 8
Wells for Abandonment

CREATED BY: AE

REVIEWED BY: AS

Jacobs

\\dc1vs01\GIS\Proj\DI\DowChemicals\Jamestown\Mapfiles\Misc\2023\Down\MS_Fig8_Wells_for_Abandonment.mxd AESPEJO 9/19/2023 10:49:32 AM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9
700 Delaware Avenue, Buffalo, NY 14209
P: (716) 851-7220 | F: (716) 851-7275
www.dec.ny.gov

October 16, 2023

Audrey Sidebottom, P.E.
The Dow Chemical Company
715 Main Street
Midland, MI 48674

**Re: Remedial Design Report
Essex; Hope Site – 907015
Jamestown, Chautauqua County**

Dear Audrey Sidebottom,

The New York State Department of Environmental Conservation (NYSDEC), in conjunction with the New York State Department of Health (NYSDOH), have received the response letter submitted on October 4, 2023, submitted on behalf of The Dow Chemical Company by Jacobs Engineering Inc. The responses appear to have addressed our previous comments with the exception of those detailed below:

- **Comment 4 – Section 2.3, Nature and Extent of Contamination (Bullet 5):** *Monitoring well MW-7DD was resampled in May 2023, please provide the results of this sample event;*

Jacobs Response: *Resampling results were provided with the Focused Feasibility Study; for reference the last round of sampling detected cis 1,2-DCE at 150 ug/L, Acetone at 7.7 ug/L, TCE at 31 ug/L, Vinyl Chloride at 10 ug/L, 2-Butanone at 6 ug/L and 1,1-DCE at and estimated 0.30 ug/L.*

NYSDEC/NYSDOH Response: The sample results from May 2023 do not appear to be presented in the Focused Feasibility Study. Please provide the page number containing the May 2023 sample results, otherwise the results should be presented in a table included in the Remedial Design Report.

- **Comment 6 – Section 3.2, Target Treatment Zone Definition:** *Within Section 3.2 and throughout the Report the extent of the treatment zone is defined by subsurface sample locations displaying chlorinated volatile organic compound (CVOCs) concentrations exceeding 25 milligrams per kilogram. The protection of groundwater soil cleanup objectives (PGW SCOs) are applicable to the contaminants of concern that are impacting groundwater at this site. The Report*



should be revised to indicate that the PGW SCOs are applicable at this site and the treatment should be designed to address on-site exceedances of PGW SCOs. If areas exceeding PGW SCOs are not proposed for treatment it needs to be clearly explained why it is not feasible to do so;

Dow/Jacobs Response: *A mass removal target of 25 mg/kg or greater was chosen as a technically and economically feasible objective for the thermal treatment system, that is consistent with the Remediation Objectives described in Section 3.3.2 of the design:*

- 1. Treatment of the source area using ISTT has reached an asymptotic rate of contaminant recovery.*
- 2. Additional input of subsurface energy will not measurably increase contaminant removal rate.*
- 3. Continued operation of the ISTT system offers no further reduction in COC mobility, or potential for contaminant migration from the TTZ.*

The system is intended to remove the large majority of constituent mass in the subsurface and treat concentrations greater than 25 mg/kg, but will likely reach an asymptotic removal condition prior to achieving the SCOs.

The FFS that was reviewed by NYSDEC outlined the treatment target of 25 mg/kg or greater in Figures 4-3 and 4-4 for Alternatives 3 and 4 respectively, and included a discussion on why this target was chosen instead of the SCOs. The 25 mg/kg target boundary was also incorporated by NYSDEC into the AROD and was shown on figures presented during public consultations on September 7, 2023. Based on these, Jacobs had understood the treatment target of 25 mg/kg had been accepted by NYSDEC.

NYSDEC/NYSDOH Response: *The point of NYSDEC's comment was that the PGW SCOs are the applicable regulatory criteria for soil contamination at the site for the contaminants of concern. Since the proposed treatment area differs from the extent of soil that exceed the PGW SCOs, the design needs to acknowledge why the treatment area is different than this extent and discuss how it is expected to achieve the PGW SCOs in the long-term.*

- **Comment 7 – Section 3.3.2, ISTT Remediation Objectives:** *Section 3.3.3. states that the operation of the system may be discontinued at Dow's discretion. Prior to system shut down, a request that provides supporting rationale to shut down the system must be submitted to the NYSDEC for review and approval. This section and any additional reference to this statement should be revised throughout the report;*

Dow/Jacobs Response: *The performance objectives for the system, and metrics to assess the achievement of the performance objectives, were outlined in Section 3.3 of the design document. Besides overall contaminant mass recovery rate,*

analytical soil sample results collected as discussed in Section 5.1.2, and total VOC concentration in vapor samples collected at individual extraction wells measured with a real-time instrument will be utilized in determining if additional significant mass reduction is feasible.

The objective of achieving asymptotic mass removal conditions will be the primary driver behind the decision to shut down the system. Asymptotic mass recovery may include a potentially significant contaminant mass contribution across the OU-01 boundary from the downgradient OU-03 area. Mass on the OU-01/OU-03 boundary will be influenced by the pressure differential between the TTZ and OU-3, resulting in an inward gradient of COC flux into the TTZ which will be recovered by the ISTT system. While this mass flux will not be significant enough to progress OU-03 towards the SCOs, it will result in a non-zero asymptotic mass recovery rate.

Once this asymptotic mass removal has been achieved, and it has been determined that further operation of the system will not significantly reduce the constituent mass in the TTZ, continued operation will incur substantial ongoing costs per day for electricity, water, and other operational costs. Shut-down decision making therefore needs to be made in a timely fashion based on the data collected, and requiring NYSDEC shutdown approval would incur delays and significant costs. In the interest of cooperation, Jacobs, Dow and Mc2 propose to set-up a conference call when this decision point is approaching but asks that a real-time decision be made during the call.

NYSDEC/NYSDOH Response: Permanent shutdown of the treatment system requires NYSDEC/NYSDOH approval. The NYSDEC expectation is that any monitoring and/or system evaluation data is provided on a regular basis as it becomes available. This will allow the NYSDEC/NYSDOH to review and evaluate the data in a timely fashion. Once it has been determined that system shutdown may be approaching, a formal system shutdown request (letter or memo) should be submitted to the NYSDEC/NYSDOH for review. The request should contain data to support asymptotic mass removal has been achieved and that continued operation of the system will not significantly reduce contaminant mass.

A call may be setup to further discuss the system shutdown request and the data that has been supplied. The NYSDEC/NYSDOH will complete a review in a timely manner and provide a formal letter regarding the determination.

- **Comment 8a – Section 4.2, ISTT System Design:** *Additional information should be provided to describe the installation of the 4 angled extraction wells displayed on Figure WFL-01;*

Dow/Jacobs Response: *The wells will be installed using a sonic drill rig. The rig is capable of tilting its mast to the prescribed angle of 43 degrees so that the well*

may be installed at an angle. Details are shown on drawing WCD-02 in Appendix B.

NYSDEC/NYSDOH Response: Within the text of the document please provide an explanation as to why angled wells have been proposed. If angle wells have been proposed to target areas where drilling is not permitted, please indicate so.

- **Comment 17 – Section 5.2, Post-Thermal Treatment Sampling:** *Post remedial monitoring may require follow-up sampling of additional media including subsurface soils, groundwater, and soil vapor to evaluate the site conditions and the potential for contaminant rebound;*

Dow/Jacobs Response: *The Focused Feasibility Solutions (FFS) document included a post-remedy groundwater monitoring program which will be carried out following the completion of the remedy. Soil sampling is intended to be performed near the end of operations; however, the criteria mentioned in Section 3.2 of the design will drive shutdown decisions.*

NYSDEC/NYSDOH Response: This comment was with regard to post remedial sampling following active thermal treatment, not relating to treatment system shutdown. Sampling of environmental media other than groundwater may be required as part of site management to determine if the remedial action objectives have been achieved.

- **Comment 18b – Figure WFL-1, ISTT Well Field Layout:** *There are 10 proposed 'vacuum monitoring wells'. Based on the scale provided in this figure, it is not clear if this is a sufficient number of wells/points are proposed to determine the extent of the pressure field and if vapor may be moving offsite; and*

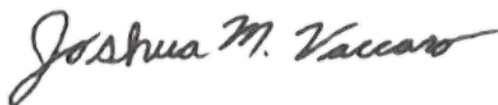
Dow/Jacobs Response: *The number and layout of the vacuum wells has been deemed sufficient based on past project experience with these systems. The system has a robust design to ensure continuous vapor capture, at a rate of 10 pore volumes per day in the vadose zone.*

NYSDEC/NYSDOH Response: Please provided supporting data including any calculations and design details used to demonstrate sufficient vacuum coverage will be achieve and that vapors will not escape. Otherwise, additional vapor monitoring should be added on the north end of OU-01 to ensure off-site areas will not be impacted.

Essex; Hope Site (907015) – Remedial Design Report
October 16, 2023

Please revise and resubmit the Remedial Design Report to address the comments above. If you have any questions regarding the above comments, please feel free to contact me at joshua.vaccaro@dec.ny.gov or (716) 541-9657.

Sincerely,

A handwritten signature in black ink that reads "Joshua M. Vaccaro". The signature is fluid and cursive, with the first name "Joshua" being the most prominent part.

Joshua M. Vaccaro
Project Manager

Ec:

Mike Cruden – NYSDEC, Bureau Director
Andria Caprio – NYSDEC, Region Hazardous Waste Remediation Engineer
Benjamin McPherson – NYSDEC, Project Supervisor
Gregory Scholand, Esq. – NYSDEC, Project Attorney
Charlotte Bethany – NYSDOH, DOH Region Chief
Angela Martin – NYSDOH, DOH Project Manager
Audrey Sidebottom – Dow, Project Manager (asidebottom@dow.com)
Joel Visser, Esq. – Dow, Project Attorney (jfvisser@dow.com)
Tyson Campbell – DuPont (tyson.e.campbell@dupont.com)
Garrett Hazebrouck – Jacobs (Garrett.Hazebrouck@jacobs.com)
Brian Carling – Jacobs (brian.carling@jacobs.com)
Ben Thompson – Jacobs (ben.thompson1@jacobs.com)



November 6, 2023

Josh Vaccaro
New York State Department of Environmental Conservation
270 Michigan Ave
Buffalo, NY 14203

**Re: Remedial Design Report
Essex; Hope Site – 907015
Jamestown, Chautauqua County**

Dear Josh:

Jacobs, on behalf of The Dow Chemical Company, is responding to the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH), response letter received on October 16, 2023. This letter provides responses to the remaining comments detailed below and serves to transmit the revised Remedial Design Report for the in-situ thermal treatment system which incorporates both rounds of comments. Individual responses are provided below:

- **Comment 4 – Section 2.3, Nature and Extent of Contamination (Bullet 5):** *Monitoring well MW-7DD was resampled in May 2023, please provide the results of this sample event;*

Jacobs Response: *Resampling results were provided with the Focused Feasibility Study; for reference the last round of sampling detected cis 1,2-DCE at 150 ug/L, Acetone at 7.7 ug/L, TCE at 31 ug/L, Vinyl Chloride at 10 ug/L, 2- Butanone at 6 ug/L and 1,1-DCE at an estimated 0.30 ug/L.*

NYSDEC/NYSDOH Response: *The sample results from May 2023 do not appear to be presented in the Focused Feasibility Study. Please provide the page number containing the May 2023 sample results, otherwise the results should be presented in a table included in the Remedial Design Report.*

Jacobs Response: *The results for MW-7DD were inadvertently omitted from the analytical table in the FFS; the lab analytical results are provided as an attachment to this letter. The Remedial Design Report has been revised to include the results from the May 2023 sampling event.*

- **Comment 6 – Section 3.2, Target Treatment Zone Definition:** *Within Section 3.2 and throughout the Report the extent of the treatment zone is defined by subsurface sample locations displaying chlorinated volatile organic compound (CVOs) concentrations exceeding 25 milligrams per kilogram. The protection of groundwater soil cleanup objectives (PGW SCOs) are applicable to the contaminants of concern that are impacting groundwater at this site. The Report should be revised to indicate that the PGW SCOs are applicable at this site and the treatment should be designed to address on-site exceedances of PGW SCOs. If areas exceeding PGW SCOs are not proposed for treatment it needs to be clearly explained why it is not feasible to do so;*

Dow/Jacobs Response: *A mass removal target of 25 mg/kg or greater was chosen as*

a technically and economically feasible objective for the thermal treatment system, that is consistent with the Remediation Objectives described in Section 3.3.2 of the design:

- 1. Treatment of the source area using ISTT has reached an asymptotic rate of contaminant recovery.*
- 2. Additional input of subsurface energy will not measurably increase contaminant removal rate.*
- 3. Continued operation of the ISTT system offers no further reduction in COC mobility, or potential for contaminant migration from the TTZ.*

The system is intended to remove the large majority of constituent mass in the subsurface and treat concentrations greater than 25 mg/kg, but will likely reach an asymptotic removal condition prior to achieving the SCOs.

The FFS that was reviewed by NYSDEC outlined the treatment target of 25 mg/kg or greater in Figures 4-3 and 4-4 for Alternatives 3 and 4 respectively and included a discussion on why this target was chosen instead of the SCOs. The 25 mg/kg target boundary was also incorporated by NYSDEC into the AROD and was shown on figures presented during public consultations on September 7, 2023. Based on these, Jacobs had understood the treatment target of 25 mg/kg had been accepted by NYSDEC.

NYSDEC/NYSDOH Response: The point of NYSDEC's comment was that the PGW SCOs are the applicable regulatory criteria for soil contamination at the site for the contaminants of concern. Since the proposed treatment area differs from the extent of soil that exceed the PGW SCOs, the design needs to acknowledge why the treatment area is different than this extent and discuss how it is expected to achieve the PGW SCOs in the long-term.

Jacobs Response: Areas of OU-01 will exceed the PGW SCOs outside of the treatment zone and possibly at locations within the TTZ following ISTT; however, MNA will be used to attenuate remaining impacts in soil and GW. If MNA is not effective at attaining PGW SCOs after the post-thermal performance monitoring period, other treatment options will be considered. As discussed previously, if Groundwater Quality Standards are attained, the PGW SCOs may no longer be applicable.

- **Comment 7 – Section 3.3.2, ISTT Remediation Objectives:** Section 3.3.3. states that the operation of the system may be discontinued at Dow's discretion. Prior to system shut down, a request that provides supporting rationale to shut down the system must be submitted to the NYSDEC for review and approval. This section and any additional reference to this statement should be revised throughout the report;

Dow/Jacobs Response: The performance objectives for the system, and metrics to assess the achievement of the performance objectives, were outlined in Section 3.3 of the design document. Besides overall contaminant mass recovery rate, analytical soil sample results collected as discussed in Section 5.1.2, and total VOC concentration in vapor samples collected at individual extraction wells measured with a real-time instrument will be utilized in determining if additional significant mass reduction is feasible.

The objective of achieving asymptotic mass removal conditions will be the primary driver behind the decision to shut down the system. Asymptotic mass recovery may include a potentially significant contaminant mass contribution across the OU- 01 boundary from the

downgradient OU-03 area. Mass on the OU-01/OU-03 boundary will be influenced by the pressure differential between the TTZ and OU- 3, resulting in an inward gradient of COC flux into the TTZ which will be recovered by the ISTT system. While this mass flux will not be significant enough to progress OU-03 towards the SCOs, it will result in a non-zero asymptotic mass recovery rate.

Once this asymptotic mass removal has been achieved, and it has been determined that further operation of the system will not significantly reduce the constituent mass in the TTZ, continued operation will incur substantial ongoing costs per day for electricity, water, and other operational costs. Shut-down decision making therefore needs to be made in a timely fashion based on the data collected, and requiring NYSDEC shutdown approval would incur delays and significant costs. In the interest of cooperation, Jacobs, Dow and Mc2 propose to set-up a conference call when this decision point is approaching but asks that a real-time decision be made during the call.

NYSDEC/NYSDOH Response: Permanent shutdown of the treatment system requires NYSDEC/NYSDOH approval. The NYSDEC expectation is that any monitoring and/or system evaluation data is provided on a regular basis as it becomes available. This will allow the NYSDEC/NYSDOH to review and evaluate the data in a timely fashion. Once it has been determined that system shutdown may be approaching, a formal system shutdown request (letter or memo) should be submitted to the NYSDEC/NYSDOH for review. The request should contain data to support asymptotic mass removal has been achieved and that continued operation of the system will not significantly reduce contaminant mass.

A call may be setup to further discuss the system shutdown request and the data that has been supplied. The NYSDEC/NYSDOH will complete a review in a timely manner and provide a formal letter regarding the determination.

Jacobs Response: *Jacobs will provide weekly progress reports to NYSDEC for remediation tracking purposes. When asymptotic removal is observed, supporting data and a formal request for a shutdown will be conveyed to NYSDEC. Jacobs requests a one-week turnaround for a call to confirm consensus on shutdown.*

- **Comment 8a – Section 4.2, ISTT System Design:** *Additional information should be provided to describe the installation of the 4 angled extraction wells displayed on Figure WFL-01;*

Dow/Jacobs Response: *The wells will be installed using a sonic drill rig. The rig is capable of tilting its mast to the prescribed angle of 43 degrees so that the well may be installed at an angle. Details are shown on drawing WCD-02 in Appendix B.*

NYSDEC/NYSDOH Response: Within the text of the document please provide an explanation as to why angled wells have been proposed. If angle wells have been proposed to target areas where drilling is not permitted, please indicate so.

Jacobs Response: *Angle wells are being installed to address areas where infrastructure impediments make installation of vertical wells impractical.*

- **Comment 17 – Section 5.2, Post-Thermal Treatment Sampling:** *Post remedial monitoring may require follow-up sampling of additional media including subsurface soils, groundwater, and soil vapor to evaluate the site conditions and the potential for*

contaminant rebound;

Dow/Jacobs Response: *The Focused Feasibility Solutions (FFS) document included a post-remedy groundwater monitoring program which will be carried out following the completion of the remedy. Soil sampling is intended to be performed near the end of operations; however, the criteria mentioned in Section 3.2 of the design will drive shutdown decisions.*

NYSDEC/NYSDOH Response: This comment was with regard to post remedial sampling following active thermal treatment, not relating to treatment system shutdown. Sampling of environmental media other than groundwater may be required as part of site management to determine if the remedial action objectives have been achieved.

Jacobs Response: *Soil sampling outside the proposed system performance monitoring is not currently planned but will be considered in the future as a means for assessing remaining impacts or attainment of SCOs after the post-thermal performance monitoring period, if MNA does not appear to be effective. The post-remedy vapor intrusion potential will be assessed and remediated, if necessary. As noted in the FFS and as discussed in Section 5.2 of the Design Report, a post-thermal groundwater sampling program is also proposed for 5 years (semiannual frequency for the first 2 years and then at an annual frequency for at least 3 additional years) following ISTT and will be provided under separate cover.*

- **Comment 18b – Figure WFL-1, ISTT Well Field Layout:** *There are 10 proposed 'vacuum monitoring wells'. Based on the scale provided in this figure, it is not clear if this is a sufficient number of wells/points are proposed to determine the extent of the pressure field and if vapor may be moving offsite; and*

Dow/Jacobs Response: *The number and layout of the vacuum wells has been deemed sufficient based on past project experience with these systems. The system has a robust design to ensure continuous vapor capture, at a rate of 10 pore volumes per day in the vadose zone.*

NYSDEC/NYSDOH Response: Please provided supporting data including any calculations and design details used to demonstrate sufficient vacuum coverage will be achieve and that vapors will not escape. Otherwise, additional vapor monitoring should be added on the north end of OU-01 to ensure off-site areas will not be impacted.

Jacobs Response: *The 10 vacuum monitoring wells are a part of the comprehensive vacuum extraction and monitoring strategy. The vacuum monitoring points are placed both inside and outside the treatment area to supplement the 34 deep extraction and 25 shallow extraction points thought the wellfield, including 5 deep and 4 shallow extraction points along the north edge of the TTZ (along the OU-01 and OU-03 boundary). The extraction wells will be equipped with a pressure/vacuum gauge and will be monitored daily as discussed in Section 5.1.2. The design extraction rate of 360 SCFM (as referenced in Table 4-1) was calculated based on a vacuum of 4.0 inches of mercury at the extraction wells and 3.0 inches of mercury at the treatment area boundary with a radius of influence of 9 feet. The distance of 9 feet is selected as the distance between electrodes and the nearest extraction well to ensure capture of steam and vapors generated at the electrode, which is the hottest point of the subsurface. The design of the extraction wells (Shown on Drawing WCD-01 in Appendix B) further ensures capture of vapors, including a 0.020-inch slot screen in the vadose zone from*

Essex; Hope Site (907015) – Remedial Design Report Response to Comments
November 6, 2023

3 to 7 feet bgs. Accordingly, the vacuum extraction system coverage is sufficient to maintain and manage vapors.

Jacobs has also provided the revised Remedial Design Report as an attachment to this letter and looks forward to approval of the design. If you have any questions regarding the above responses, please feel free to contact me at (215) 834-5397 or via email at brian.carling@jacobs.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Brian Carling', with a stylized flourish at the end.

Brian Carling
Project Manager

cc:

Mike Cruden – NYSDEC, Bureau Director
Andria Caprio – NYSDEC, Region Hazardous Waste Remediation Engineer
Benjamin McPherson – NYSDEC, Project Supervisor
Gregory Scholand, Esq. – NYSDEC, Project Attorney
Charlotte Bethany – NYSDOH, DOH Region Chief
Angela Martin – NYSDOH, DOH Project Manager
Audrey Sidebottom – Dow, Project Manager (asidebottom@dow.com)
Joel Visser, Esq. – Dow, Project Attorney (jvisser@dow.com)
Tyson Campbell – DuPont (tyson.e.campbell@dupont.com)
Garrett Hazebrouck – Jacobs (Garrett.Hazebrouck@jacobs.com)
Joel Krueger – Jacobs (Joel.Krueger@jacobs.com)

Project Name: ESSEX/HOPE ANNUAL GW 2023**Lab Number:** L2328071**Project Number:** JMS017DW**Report Date:** 06/05/23**SAMPLE RESULTS**

Lab ID: L2328071-06
 Client ID: MW-7DD-20230519
 Sample Location: 125 BLACKSTONE AVE, JAMESTOWN, NY

Date Collected: 05/19/23 08:45
 Date Received: 05/20/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 1,8260D

Analytical Date: 05/30/23 15:46

Analyst: MJV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	2.5	0.70	1
1,1-Dichloroethane	ND		ug/l	2.5	0.70	1
Chloroform	ND		ug/l	2.5	0.70	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
Chlorobenzene	ND		ug/l	2.5	0.70	1
Trichlorofluoromethane	ND		ug/l	2.5	0.70	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70	1
Bromodichloromethane	ND		ug/l	0.50	0.19	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1-Dichloropropene	ND		ug/l	2.5	0.70	1
Bromoform	ND		ug/l	2.0	0.65	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17	1
Benzene	ND		ug/l	0.50	0.16	1
Toluene	ND		ug/l	2.5	0.70	1
Ethylbenzene	ND		ug/l	2.5	0.70	1
Chloromethane	ND		ug/l	2.5	0.70	1
Bromomethane	ND		ug/l	2.5	0.70	1
Vinyl chloride	10		ug/l	1.0	0.07	1
Chloroethane	ND		ug/l	2.5	0.70	1
1,1-Dichloroethene	0.30	J	ug/l	0.50	0.17	1
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1

Project Name: ESSEX/HOPE ANNUAL GW 2023**Lab Number:** L2328071**Project Number:** JMS017DW**Report Date:** 06/05/23**SAMPLE RESULTS**

Lab ID: L2328071-06
 Client ID: MW-7DD-20230519
 Sample Location: 125 BLACKSTONE AVE, JAMESTOWN, NY

Date Collected: 05/19/23 08:45
 Date Received: 05/20/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	31		ug/l	0.50	0.18	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70	1
Methyl tert butyl ether	ND		ug/l	2.5	0.70	1
p/m-Xylene	ND		ug/l	2.5	0.70	1
o-Xylene	ND		ug/l	2.5	0.70	1
Xylenes, Total	ND		ug/l	2.5	0.70	1
cis-1,2-Dichloroethene	150		ug/l	2.5	0.70	1
1,2-Dichloroethene, Total	150		ug/l	2.5	0.70	1
Dibromomethane	ND		ug/l	5.0	1.0	1
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70	1
Styrene	ND		ug/l	2.5	0.70	1
Dichlorodifluoromethane	ND		ug/l	5.0	1.0	1
Acetone	7.7		ug/l	5.0	1.5	1
Carbon disulfide	ND		ug/l	5.0	1.0	1
2-Butanone	6.0		ug/l	5.0	1.9	1
Vinyl acetate	ND		ug/l	5.0	1.0	1
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0	1
2-Hexanone	ND		ug/l	5.0	1.0	1
Bromochloromethane	ND		ug/l	2.5	0.70	1
2,2-Dichloropropane	ND		ug/l	2.5	0.70	1
1,2-Dibromoethane	ND		ug/l	2.0	0.65	1
1,3-Dichloropropane	ND		ug/l	2.5	0.70	1
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70	1
Bromobenzene	ND		ug/l	2.5	0.70	1
n-Butylbenzene	ND		ug/l	2.5	0.70	1
sec-Butylbenzene	ND		ug/l	2.5	0.70	1
tert-Butylbenzene	ND		ug/l	2.5	0.70	1
o-Chlorotoluene	ND		ug/l	2.5	0.70	1
p-Chlorotoluene	ND		ug/l	2.5	0.70	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70	1
Hexachlorobutadiene	ND		ug/l	2.5	0.70	1
Isopropylbenzene	ND		ug/l	2.5	0.70	1
p-Isopropyltoluene	ND		ug/l	2.5	0.70	1
Naphthalene	ND		ug/l	2.5	0.70	1
n-Propylbenzene	ND		ug/l	2.5	0.70	1

Project Name: ESSEX/HOPE ANNUAL GW 2023**Lab Number:** L2328071**Project Number:** JMS017DW**Report Date:** 06/05/23**SAMPLE RESULTS****Lab ID:** L2328071-06**Date Collected:** 05/19/23 08:45**Client ID:** MW-7DD-20230519**Date Received:** 05/20/23**Sample Location:** 125 BLACKSTONE AVE, JAMESTOWN, NY**Field Prep:** Not Specified**Sample Depth:**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,4-Dioxane	ND		ug/l	250	61.	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	120		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	110		70-130