July 10, 2020

Town of Westport
Department of Public Works
110 Myrtle Avenue
Westport, CT 06880

Attn: Mr. Peter Ratkiewich

RE: Supplemental Soil Investigation and Preliminary Risk Assessment Report
Baron's South Property
Imperial Avenue and Compo Road South, Westport, Connecticut

Dear Mr. Ratkiewich:

Thunderbird Environmental, LLC (Thunderbird) has prepared this letter report and its Attachments to document supplemental soil investigation and preliminary risk assessment activities conducted at the Town of Westport's 22.25-acre "*Barons South Property*" in February 2020 (referred to herein as "the Site"). Mr. Darby Hittle led the soil investigation activities; he is a Connecticut Licensed Environmental Professional (LEP) with more than 25 years of professional environmental site assessment and hazard mitigation experience. Dr. Kurt A. Frantzen performed the preliminary risk assessment activities; he is a human health and ecological risk assessor with more than thirty years of professional ecological and human health risk assessment experience. Copies of Mr. Hittle's and Dr. Frantzen's resumes are included in **Attachment A**. A summary of relevant background information, soil investigation and risk assessment findings, and our conclusions and recommendations are provided herein.

1. Background and Purpose

The Site is comprised of 22.5-acres of land located in the central portion of Westport to the south of U.S. Route 1, and between Imperial Avenue and Compo Road South (see the attached **Figure 1)**. Based on historical sources, the Site is the location of the former Baron's Estate (circa 1967 to 1983), which included five residences, a greenhouse, two garages, flower gardens, and a perfume laboratory building. The Baron's Estate reportedly included large botanical gardens, and historical site-wide application of pesticides (including arsenic) likely occurred at the Site. The Site is currently comprised of several occupied and vacant residential buildings, the Town of Westport Center for Senior Activities, and open meadows and wooded areas that are used for recreational purposes such as hiking and wildlife viewing.

Approximately 5,000 cubic yards of excess soil was excavated and stockpiled on the south-central portion of the Site during an expansion of the Senior Center building and its associated paved parking lot in 2018. Sampling and analysis of the stockpiled soil was conducted in May 2019 to address concerns that the soil contained solid waste and/or hazardous materials. Based on the results of the May 2019 sampling, trace concentrations of pesticides, asphalt related compounds, and naturally occurring metals (including arsenic) were reported in the stockpiled soil samples. Arsenic was reported at a concentration of 13 milligrams per kilogram (mg/kg) in one of the May 2019 soil stockpile samples, which is slightly above Connecticut's established residential direct exposure criteria (RDEC) for arsenic in soil of 10 mg/kg. Arsenic can be present in soil at naturally occurring concentrations above 10 mg/kg. Elevated concentrations of arsenic in the stockpiled soil became the focus of additional investigation because: 1) the soil had been previously excavated; 2) there were concerns that the soil contained solid waste and/or hazardous materials; and 3) the Town had a potential need to reuse or dispose of the material at an off-site location.

A total of 26 additional representative samples were collected from within the stockpiled soil in December 2019 and January 2020 in an effort to further characterize the material and to provide the Town with potential reuse and/or off-site disposal options. As shown on the **graph in Section 3 below**, the average concentration of Arsenic in the stockpiled soil was found to be 10.4 milligrams per kilogram (mg/kg), slightly above the residential criteria of 10 mg/kg being used for data comparison purposes. Subsequent to the December 2019/January 2020 sampling, additional site-wide soil data was determined to be needed to further evaluate whether arsenic in the stockpiled soil was: 1) naturally occurring; or 2) associated with historical site-wide use of pesticides or some other human activity.

The purpose of the supplemental soil sampling and analysis described in this report was to: 1) collect sufficient data to confirm the arsenic concentrations in shallow soil across the Site; and 2) compare this site-wide arsenic data to the stockpiled soil data; and 3) attempt to draw a conclusion regarding a potential source of elevated arsenic in the stockpiled soil (natural or due to human-related activity). Subsequent to the supplemental soil investigation activities, a preliminary risk assessment was to consider whether elevated arsenic concentrations in the stockpiled soil and/or in shallow soil throughout the Site pose a significant risk to human health or the environment.

2. Supplemental Soil Investigation

Supplemental soil investigation activities were conducted in February 2020 aimed at collected site-wide soil arsenic data at the Site. A total of 160 soil samples were collected from thirty-two (32) shallow soil borings (identified as TB-1 through TB-32) advanced throughout undeveloped portions of the Site in

February 2020. Soil sample locations were selected specifically to be located within the undeveloped portions of the Site where human activities and/or development would not be expected to have impacted the underlying soil, and where detected concentrations of arsenic in soil would most likely be representative of naturally occurring arsenic. At each soil sample location, discrete soil samples were collected across a vertical profile at depth intervals of 0-3 inches, 3-6 inches, 6-12 inches, 1-2 feet, and 2-3 feet. Soil boring and sampling locations are depicted on **Figure 2**.

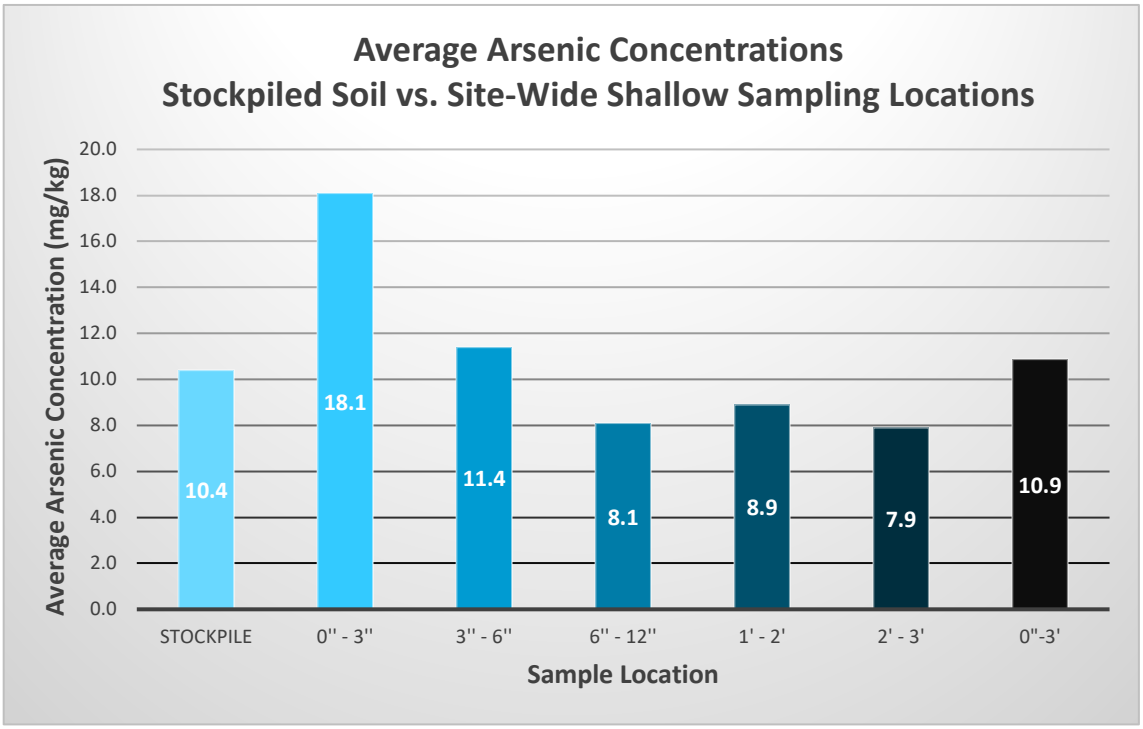
Soil samples were collected using a hand-driven soil coring auger and sufficient sample volume from the sample location (and depth interval) was collected in a stainless-steel mixing bowl, mixed with a stainless-steel spoon and collected in a zip lock plastic bag. Sampling equipment was decontaminated following collection of each of the 160 soil samples. Each sample was screened for total arsenic using a hand-held X-Ray Fluorescence Spectroscopy (XRF) unit. A subset of 20 soil samples were submitted to a Connecticut-certified environmental laboratory to be analyzed for total arsenic via USEPA Method 6010.

3. Soil Investigation Results

In order to evaluate site-wide Arsenic concentrations in shallow soil, Dr. Frantzen performed a statistical analysis using the results from the 30 samples collected from the stockpiled soil and the 160 sample set from presumed undeveloped portions of the Site. Based on the Rosner Outlier Test, five (5) outliers were identified at a 1% confidence level in the 2020 dataset.

Therefore, the raw dataset was trimmed to remove the identified outliers and determine average Arsenic concentrations. As presented in the graph below, the average Arsenic concentrations vary based on depth with the highest Arsenic concentrations present in surficial soils (surface to 3 inches below grade) at the Site.

As shown in the graph below, arsenic concentrations within the stockpiled soil do not appear to differ significantly from arsenic concentrations reported in the site-wide soil samples. Rather, reported Arsenic concentrations in the stockpiled soil appear consistent with Arsenic concentrations in Site soils across the first 3-foot soil horizon. We conclude that the high concentration "outliers" in the dataset are likely associated with a release at the Site, probably due to historical arsenical pesticide application(s). A summary report of the statistical analyses prepared by Dr. Frantzen is included in **Attachment B**.



4. Significant Environmental Hazard Abatement

Based on the results of the site-wide supplemental soil sampling activities conducted in February 2020, Arsenic was reported in one soil sample (TB-2/1-2') at a concentration of 182 mg/kg, which is more than 15 times the established R DEC for arsenic of 10 mg/kg. Boring TB-2 is located near the former Baron's laboratory building, and therefore the elevated arsenic reported in the TB-2 sample is likely related to a release of arseno-pesticides near this building.

Pursuant to Section 22a-6u(d) of the Connecticut General Statutes (CGS), polluted soil present within two feet of the surface contaminated with a substance, other than total petroleum hydrocarbons, at a concentration at or above 30 times the Remediation Standard Regulation (RSR) Industrial / Commercial Direct Exposure Criteria (I/C DEC) or 15 times the Residential Direct Exposure Criteria (R DEC) requires notification to the Connecticut Department of Energy and Environmental Protection (DEEP) of a significant environmental hazard (SEH) condition unless abated within 90 days of being identified.

The client and property owner were verbally notified of the SEH condition on April 20, 2020 and the hazard was subsequently abated via excavation on May 20, 2020.

Approximately four (4) cubic yards of soil were excavated from the area surrounding boring TB-2 on May 20, 2020. The soil was temporarily stockpiled on polyethylene sheeting at the Site and subsequently disposed of at an approved off-site disposal facility on June 16, 2020. Based on the results of post-excavation confirmatory soil sampling conducted within the SEH abatement area, the SEH was successfully abated via discrete excavation of soil within the vicinity of boring TB-2, and as such, notification to DEEP is not required. A copy of the laboratory analytical results for TB-2, confirmation samples, and waste soil disposal manifests are included in **Attachment C**. The excavation limits and sample locations are depicted on **Figure 2**.

5. Preliminary Risk Assessment

Subsequent to supplemental soil investigation activities, Thunderbird requested Dr. Kurt A. Frantzen to conduct a preliminary risk assessment to evaluate potential human health risks associated with documented arsenic concentrations in shallow soil at the Site.

According to Dr. Frantzen, Arsenic is a naturally occurring element in soil that is released to the environment from both natural sources and human sources, including nonferrous metal mining and smelting, pesticide application, coal combustion, wood combustion, and waste incineration. Most Arsenic releases are to land or soil, but substantial amounts can enter water and air.

Based on available published data, the background concentration of Arsenic in soils (soil Arsenic) throughout the northeast United States is reported by the respective state regulatory agencies to range from 7 to 20 mg/kg in Connecticut, Massachusetts, New York, and Rhode Island. According to the United States Agency of Toxic Substances and Disease Registry (ATSDR), natural levels of Arsenic in U.S. soils generally range from 1 to 40 mg/kg. Therefore, based on a statistical analysis of the recently collected site-wide soil data, arsenic concentrations in soil at the Site appear typical of arsenic concentrations in soil throughout New England.

Potential health risk associated with soil Arsenic is driven primary by two factors: exposure and toxicity. Exposure to soil Arsenic requires direct contact and intensive interaction with the soils in question. According to the ATSDR, the principal route of exposure to Arsenic for the general population is oral intake, primarily in food and drinking water.

The State of Connecticut designed its residential (R) and industrial/commercial (I/C) soil criteria to allow human exposure for a regular frequency, typical intensity level, and for an extended period. In the case of soil Arsenic, these criteria are driven by the state's non-urban soil background concentration; that is, the State emphasizes that the best way to protect human health is to maintain exposure levels around

background soil concentrations, preferably below non-urban soil background concentrations of around 10 mg/kg.

Regarding risk to human health from soil Arsenic, the Site is located within an urbanized area and has limited current usage but is occasionally accessed by the public for walking and exercising (running). Other forms of limited trespass are possible; however, the property's ground cover is well vegetated in areas not covered with buildings or impervious surfaces (i.e. asphalt and concrete). The vegetative cover and impervious surfaces greatly decrease direct human contact with Site soils and suppress the potential for dust creation or soil erosion. Therefore, direct and indirect exposure to soil Arsenic at the Site is minimal and, therefore, risk to human health from arsenic in soil at the site is low.

6. Conclusions and Recommendations

Thunderbird conducted a Supplemental Soil Investigation and Preliminary Risk Assessment at the Site to evaluate whether Arsenic concentrations in the onsite soil stockpile are indicative of a release or are consistent with site-wide concentrations and whether site-wide arsenic concentrations pose a risk to human health.

Based on an analysis of the 2019 and 2020 Arsenic datasets, the highest Arsenic concentrations are present in surficial soils (surface to 3 inches below grade) at the Site. Five (5) outliers were identified in the 2020 dataset, which may be indicative of a release at the Site, likely due to historical arsenical pesticide applications. The analysis of the Arsenic in soil datasets shows that the stockpiled soil does not appear anomalous or attributable to a discrete release; rather, the Arsenic concentrations in the stockpiled soil appear to be consistent and typical of soil Arsenic concentrations throughout the Site. ***As such, the stockpiled soil is suitable for on-site reuse, including reuse of this material at its current location within the south-central portion of the Site.***

During the February 2020 Supplemental Soil Investigation, one soil sample (TB-2) at a depth interval of 1-2 feet, had a reported laboratory analytical arsenic concentration greater than 15 times the R DEC. Based on the concentration and location of the sample within two feet of the surface, the sample met the definition of a Significant Environmental Hazard. The client and property owner were verbally notified of the SEH condition on April 20, 2020 and the hazard was subsequently abated via excavation on May 20, 2020.

Regarding risk to human health from arsenic in soil, the Site is located within an urbanized area and has limited usage currently but is occasionally accessed by the public for walking and exercising (running). Other forms of limited trespass are possible; however, the ground cover is well vegetated in areas not

covered with buildings or impervious surfaces (i.e. asphalt and concrete). The vegetative cover and impervious surfaces greatly decrease direct human contact with Site soils and suppresses the potential for dust creation or soil erosion. ***Therefore, direct and indirect exposure to soil Arsenic at the Site is minimal and, therefore, risk to human health from arsenic in soil at the site is low.***

Based on the available information, direct or indirect exposure to soil Arsenic at the Site appears to be minimal. However, if additional assurance is needed regarding the potential risk to human health, a comprehensive human health risk assessment could be conducted to further quantify human health exposure and associated risk to surface soil Arsenic at the Site.

7. Limitations

This Report is intended solely for the use of the "addressee." Thunderbird will accept no liability or responsibility to any person or entity other than those to whom the Report is addressed. This Report must not be made available or copied in whole or in part to any other person without Thunderbird's written permission. This report cannot be relied upon by anyone other than the addressee without the expressed written consent of Thunderbird Environmental, LLC.

As with any environmental investigation of this nature, there is a potential for environmental conditions to be present that were not identified within the defined scope of services documented in this report. The scope of services documented herein were not intended to confirm the potential presence of all possible hazardous materials at the site. If impacts to soil and ground water have not been identified during the defined scope of services, such a finding should not therefore be construed as a guarantee of the absence of such materials on the Site, but rather as the result of the services performed within the scope, limitations, and cost of the work performed.

Any opinions or recommendations presented apply to site conditions existing when services were performed within the defined scope of services. We are unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces. We assume no responsibility for conditions we were not authorized to investigate, or conditions not generally recognized as environmentally unacceptable when services were performed.

8. Closing

We have appreciated the opportunity to assist the Town of Westport with this project. If you have any questions or comments regarding this report, please do not hesitate to contact us at 860-227-4714.

Sincerely,
THUNDERBIRD ENVIRONMENTAL, LLC

Darby W. Hittle, L.E.P.
Principal / Owner

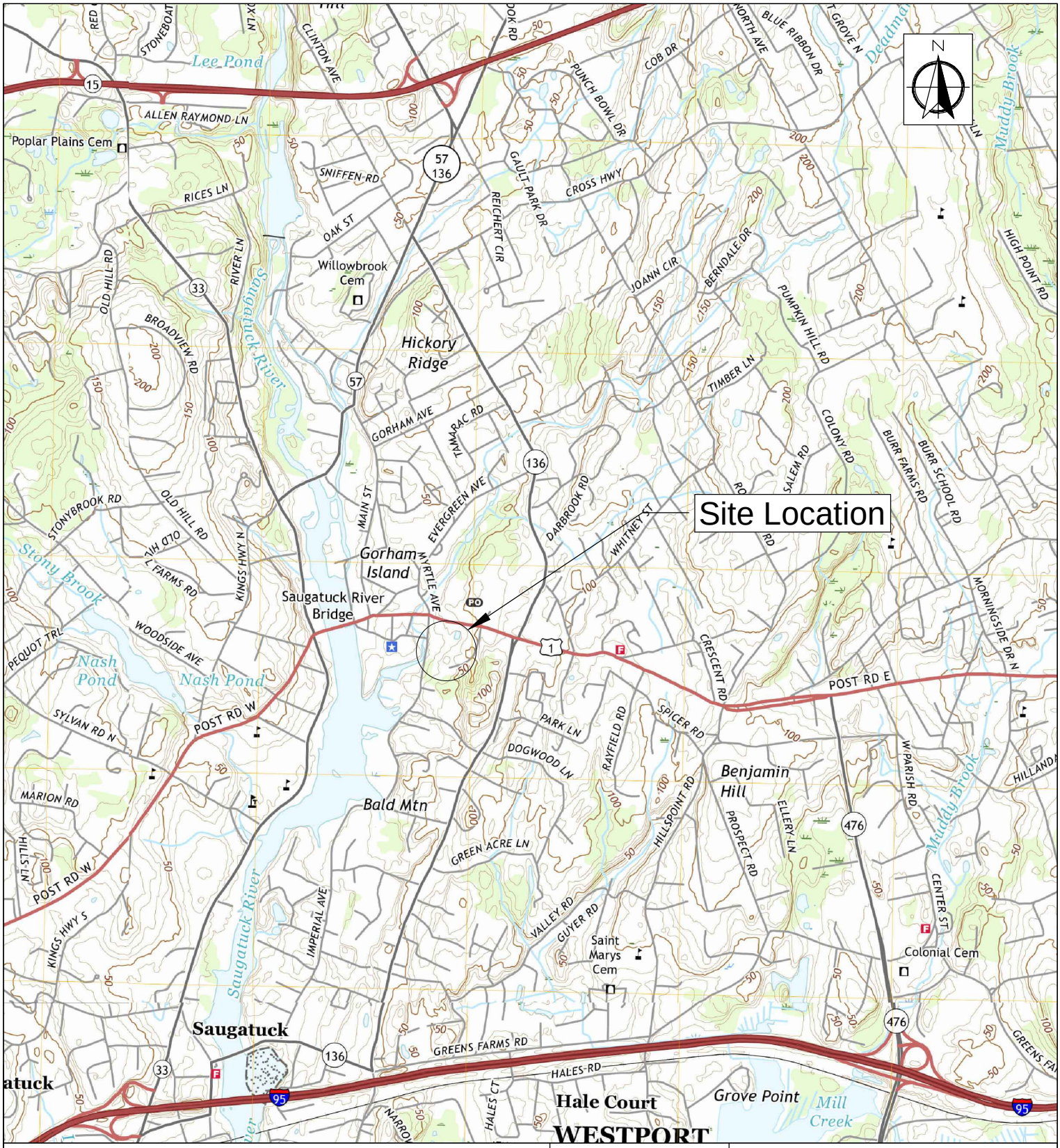
RemVēr

Kurt A. Frantzen, PhD

Enclosures:

Figures
Attachment A – Background Soil Assessment Summary
Attachment B – Laboratory Analytical Reports

FIGURES



THUNDERBIRD ENVIRONMENTAL

14 Leffingwell Road
Clinton, Connecticut 06413
ph: (860) 227-4714
web: tbirdenv.com

Site Location:

21 Imperial Avenue and 52, 52A, 68, 70, 72 Compo Road South, CT

Project Number:

2019_096

Topographic Map Source

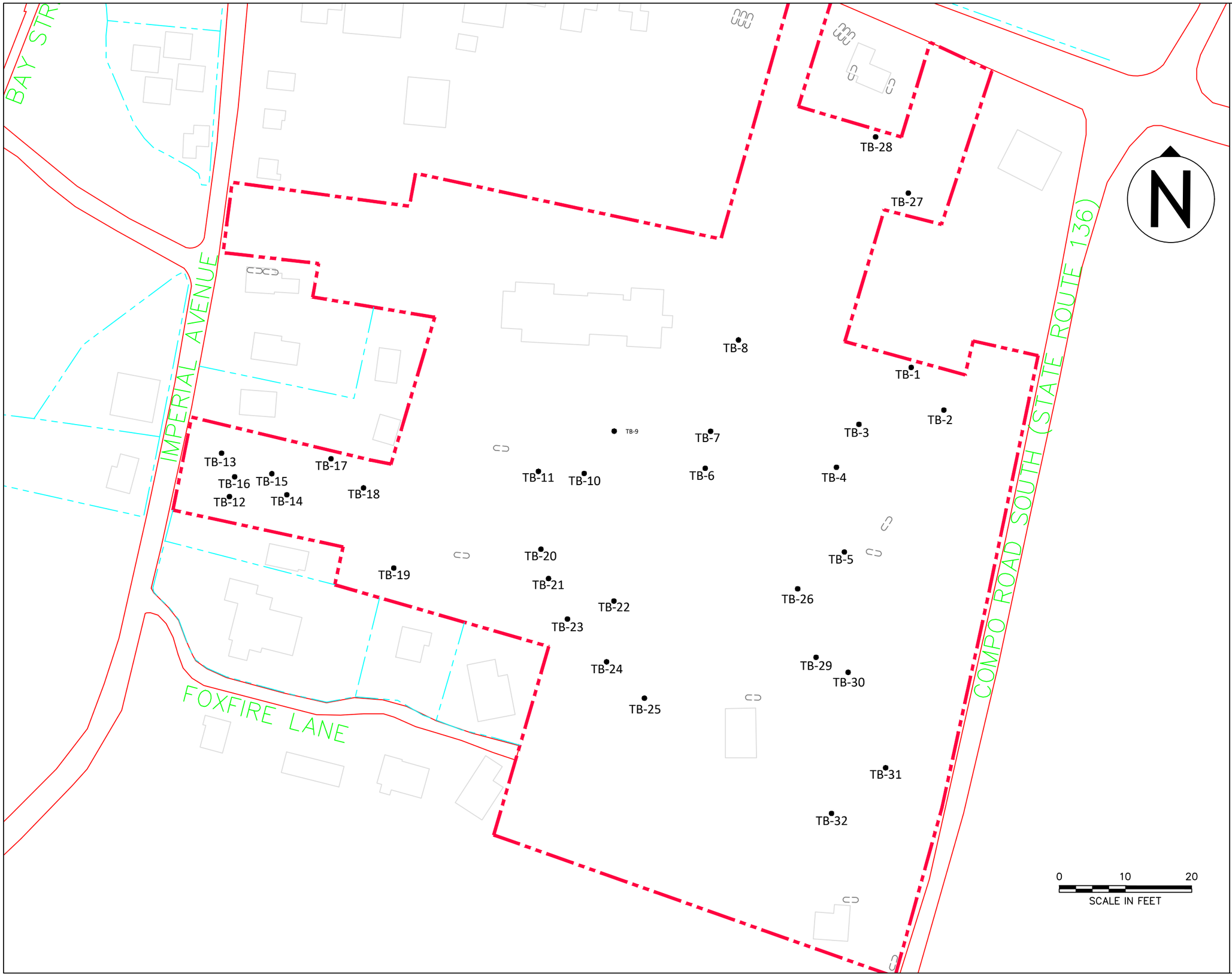
State: Connecticut

USGS 7.5' Quadrangle: Westport

Year: 2018

Scale: 1:2000

FIGURE 1
Site Location Map



Legend

- PROPERTY LINE
- SITE BOUNDARY
- SOIL BORING

Notes:

Soil sample locations depicted on this figure are approximated. This figure is not intended for construction purposes.

14 Leffingwell Road
Clinton, Connecticut 06413
ph: (860) 227-4714
web: tbirdenv.com

Supplemental Soil Sampling Locations

Site Map

Site Address:
21 Imperial Avenue and 52, 52A, 68, 70, 72 Compo Road South, CT

Project Number:	Drawn By:
2019_096	ICD

Date:	Scale:
2/26/2020	As Shown

FIGURE 2

ATTACHMENT A

Resumes of Key Staff

THUNDERBIRD ENVIRONMENTAL, LLC

Darby W. Hittle, L.E.P.

Owner / President

Education

Bachelor of Science, Geology
Bloomsburg University of Pennsylvania, 1995

Experience

25 years as a professional geologist and environmental consultant working throughout Connecticut, New England, Mid-Atlantic and Rocky Mountain Regions;

7 years as a U.S. Air Force Civil Engineer and Load Master (1986 to 1995)

Air Force One Fire Safety officer during the Regan / Bush Sr. Administrations (1988 to 1990)

Professional Licenses / Certifications

CT DEEP Licensed Environmental Professional (LEP Lic. #421)

CT DPH Licensed Asbestos Project Monitor

MT Stormwater Pollution Prevention Plan Administrator

NEPA Certification (in progress)
Utah State University

Professional Affiliations

Environmental Professionals' Organization of Connecticut

Key Practice Areas

Licensed Environmental Professional (LEP) Services, Environmental Site Assessments, Groundwater Quality Monitoring, Remediation, Soil Management, Stormwater Pollution Prevention Plan Administration, Permitting and Compliance, Asbestos Project Monitoring, Data Collection and Interpretation, Underground Storage Tank Closure, Site Redevelopment Assistance, Materials Management, Risk Management.

Summary Biography

As the founder and owner of Thunderbird Environmental LLC, Mr. Hittle has over 25 years of professional experience and specializes in the environmental assessment of land, permitting and compliance, remediation, stormwater administration, and closure of sites with soil and ground water contamination. Mr. Hittle has managed over 100 environmental assessment and site remediation projects varying in size from small residential and commercial properties to large industrial aerospace manufacturing facilities. Mr. Hittle is well versed in state and federal environmental regulations and has provided investigation and closure support for various facilities under the Connecticut Property "Transfer Act," and other State and Federal Programs such as the VRP, RCRA and TSCA. Mr. Hittle has personally overseen the investigation and remediation of numerous contaminated sites (including former MGP sites) throughout Connecticut and New York.

In his role as Principal / Owner, Mr. Hittle is responsible for day-to-day operations of Thunderbird Environmental, client communications, scheduling, management of company personnel, and the preparation of project deliverables. Mr. Hittle has managed the remediation of soil and groundwater at numerous Sites to address a wide range of compounds of concern, including petroleum products, chlorinated solvents, metals, pesticides and herbicides, ammonia, asbestos impacted soil, and polychlorinated biphenyls (PCBs), and polyfluoroalkyl substances (PFAS). Mr. Hittle has managed the implementation of several different remedial technologies, including air sparge / soil vapor extraction (AS / SVE), excavation and off-site disposal, design and installation of engineered controls (i.e. capping), groundwater extraction and treatment, and in-situ chemical oxidation (ISCO). Mr. Hittle has performed work in remote locations, is bear aware, and has recent (September 2019) back country hiking experience within Yellowstone National Park.

KURT A. FRANTZEN

RESUME

PO Box 848 Colchester, CT 06415
(860) 537-8524 (860) 949-5477 C
kafrantzen@comcast.net SKYPE: KAFrantzen
https://www.linkedin.com/in/kurt-frantzen-55b04029/

Environmental Risk Assessor

REMVER (Owner) 2004–2006 & 2011–Present

Data quality review; environmental science & forensics support; hazard, exposure, risk identification, and assessment (eco, health, & systems); and litigation support / expert witness services

AECC GROUP (Senior Consulting Scientist) 2014–2019

General environmental science consulting related to contaminated property; and general environmental consulting associated with RCRA, EPCRA, stormwater, and compliance support to Biopharmaceutical manufacturer regarding industrial wastewater (monitoring/reporting, permitting, NOV/CO resolution). Served as wastewater process leader with expansion design/build team.

PACE UNIVERSITY LAW SCHOOL (Adjunct Professor) 2013–2014

Science for Environmental Attorneys (ENV 802)

KLEINFELDER, INC. (Senior Principal Scientist) 2006–2011

Lead ecological risk assessor, Project Manager for multiple projects, including the successful cleanup (<$1M) of Orangetown Shopping Center (NY) dry cleaner solvent release (received *Letter of Completion* in 2011), completed ten-year (2001-2011) Environmental Management Program at Nott Street Industrial Park (Schenectady)

VHB, INC. (Associate Stockholder) 1999–2004

Environmental risk assessment lead; private/industrial/utility clients; $2M revenue/year @ 10% profit; 10 professionals across virtual platform; Program Consultant (1993-2004) for Brooklyn Union/KeySpan MGP portfolio (*M&A due diligence, RI/FS/Remediation, cleanup goal development, insurance/litigation support, planning/negotiations, and technical spokesperson*)

GEI CONSULTANTS, INC. (Senior Project Manager) 1997–1998

Provided human/eco-risk assessment and vapor intrusion project support for industrial sites (former MGPs and Brownfields) in MA, NY, RI, MD, and FL; contributing >$1M in revenue growth

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC. (Senior Project Manager) 1991–1992

Managed upland resources component of re-use vs. disposal assessment of NYC sewage sludge, Kelly AFB surface water quality monitoring program, and various eco-risk assessment projects

ECOLOGY AND ENVIRONMENT, INC. (Senior Scientist, Technical Manager) 1986–1997

From Scientist to group manager providing corporate R&D and human and ecological risk assessment services to industrial and government clients. PG&E-Hinkley Hex-Chrome site risk assessment, Brooklyn Union Coney Island MGP site, occupational exposure litigation overturning court stay for Tooele Chemical Agent Disposal Facility, Tenneco Pipeline PCB investigation of 49 sites in 9 states (>$20M value), and Phase II technical justification of reparations claim for intermediate/chronic public health effects from Gulf War I against Iraq before UN Claims Commission

KURT A. FRANTZEN

Education

PhD—Life Sciences/Biochem, U Nebraska-Lincoln
MS—Plant Pathology, Kansas State U
BS—Biology, U Nebraska-Omaha

Certifications

CHMM (#~~14143~~, 2007-2018, *lapsed*)
OSHA HAZWOPER (40-hr/Annual)

Computer/Software

MS-Office Suite EQuIS
Decision Analysis: DEFENDER, DECERNS & MCDA
Statistics: Excel with Analyze-It & ProUCL, ProStat

Project Management

Responsibility for projects costing $10K (or less) and up to $25M

Publication/Presentation Highlights

Lecturer @ Harvard Graduate School of Design's Brownfields Practicum ['99-'18]

Lecturer @ Pace University Law School '10-'14 [ENV 802 & Moot Court]

Chap. 22 Cleanup Goals, *Brownfields Law & Practice*, 2004-Present, Lexis/Nexis

Use of Risk Assessment in Risk Management of Contaminated Sites, 2008, ITRC (co-editor/author)

Risk-Based Analysis for Environmental Managers, 2002, CRC/Lewis (editor & co-author)

Sixty-one Conference Papers & Invited Professional Presentations

Volunteer Work Highlights

Colchester, CT Board of Selectman, Selectman, May-2014 – November-2015

Colchester, CT Sewer & Water Commission, Commissioner 2014

Colchester, CT Inland Water & Wetlands Commission, Vice Chairman/Commissioner 2012-2014, Commissioner 2010–2011, Alternate 2008-2009

Mediator /Arbitrator, BBB-Community Dispute Settlement Center, Buffalo, NY, 1996

Board of Director Appointments

Clean Land Fund, 501(c)3 corp., 2007 – 2011

Western New York Forum on Conflict and Consensus, Inc., FY-1996

Administrative and Related Responsibilities Highlights

Member	Principal Professionals Group	Kleinfelder	2007 – 2011
Member	Corporate Operations Committee	VHB	1999 – 2003
Member	Operations Network	E & E	1995 – 1997

ATTACHMENT B

Background Soil Assessment Summary

Background Soil Assessment Summary

Introduction

Thunderbird Environmental, LLC (Thunderbird) performed additional Environmental Site Assessment (ESA) of a 21.25-acre property located at 60 Compo Road South in Westport, CT, called the former Baron's estate (circa 1910 to 1983). The property's composition includes multiple discrete parcels, collectively discussed herein as the "Site" or "Property" (see Figure 1): 60 Compo Road South, 52 Compo Road South, 52A Compo Road South, 68 Compo Road South, 70 Compo Road South, 72 Compo Road South, and 21 Imperial Avenue addresses. The former Baron's Estate included five residences, a greenhouse, two garages, gardens, a chemical laboratory, and a separate laboratory within the 52 Compo Road South residence.

The Town of Westport purchased the Site in 1999 and redeveloped the western portion of the Site in 2003 to include the existing Westport Center for Senior Activities. The Town constructed additional improvements to the senior center building and additional parking in 2018, which resulted in a 5,000 CY soil stockpile. Initial soil sampling of the soil stockpile (in March-2019) resulted in detections of trace concentrations of organochlorine pesticides, toluene, polycyclic aromatic hydrocarbons (PAHs), and metals/metalloids (including arsenic).

Late in 2019, Thunderbird performed supplemental soil sampling and analysis of the stockpile, focused on Arsenic as a chemical of potential concern (or COPC). Thunderbird collected and had a laboratory analyze thirty (30) soil samples for Arsenic, which had a concentration range of 6.12–17.5 mg/kg. CT-DEEP established the following criteria for Arsenic in soil:

- CT Non-Urban Soil Background Concentration <10 mg/kg
- Residential Direct Exposure Criteria 10 mg/kg [R-DEC]
- Industrial/Commercial Direct Exposure Criteria 10 mg/kg [I/C-DEC]

The combined 2019 analytical results had fourteen (14) samples with Arsenic concentrations above either the R-DEC or I/C-DEC. In addition, two (2) soil samples analyzed for leachable Arsenic using the Synthetic Precipitation Leaching Procedure (SPLP) resulting in a detectable concentration of 5 µg/L, but were below the CT-DEEP GA Pollutant Mobility Criterion of 50 µg/L.

Due to the Arsenic soil concentration range transitioning over the CT-DEEP bright-line criteria, the Town, prior to additional decision-making, tasked Thunderbird to refine the assessment of Arsenic concentration levels in Site soils.

Method

For the purposes of this effort we will use the following definitions:

- Naturally Occurring Background—chemical residuals in soil that are present as a result of geochemical or soil-forming processes not influenced by human activity, and attributable to natural geological and hydrogeological characteristics of the area.
- Anthropogenic Background Chemicals—chemical residues in soil that are synthetic or natural having entered the environment due to human activity but not necessarily related to specific activities at the site. Such chemicals typically are widely distributed in the environment due to human activities, not related to site sources or releases, and attributable to past and present legal applications or sources. In some cases, it is unclear whether a constituent is naturally occurring or anthropogenic in origin.

Natural concentrations of inorganics vary with soil type. Therefore, when seeking to distinguish between natural background, anthropogenic background, and site-related soil contamination soil type identification is done whenever possible. Natural and anthropogenic chemical concentrations can vary with soil depth; thus, background samples are required from the same soil horizon(s) as site soil samples. Using the USDA-NRCS online Soil-Web soil survey viewer, Thunderbird found several soil types may be present across the property (see Table 1 below).

Sampling

LOCATIONS

Based upon previous sampling efforts and knowledge gained during the preparation of the February 2020 Phase I Environmental site Assessment (ESA), Thunderbird mapped 30+ possible sample locations across the property (see Figure 2). These locations avoided paved roadways or in areas that are demonstrably fill, refuse, or soil piles. At each location, undecomposed plant and leaf litter were removed until the first soil horizon is exposed, then discrete samples collected across a vertical profile at the following depth intervals:

- 0–3 inches (surface soil) Horizon(s): Oe – A – Ap
- 3–6 inches Horizon(s): A – Ap
- 6–12 inches Horizon(s): Ap – Bw1 / C1
- 1–2 feet Horizon(s):
- 2–3 feet Horizon(s):

SAMPLE COLLECTION AND ANALYSIS

Collection used a hand-driven soil coring device. Sufficient sample volume from the sample location (and depth interval) was collected in a stainless steel mixing bowl and mixed with a stainless steel spoon. A sub-sample collected in a Ziplock plastic bag for X-Ray Fluorescence Spectroscopy (XRF) analysis and a sub-sample collected for submission for laboratory analysis. Laboratory chemical analysis (USEPA Method 6010) was performed on a subset of twenty (20) samples. Equipment was decontaminated prior to leaving each sample location. Collection of duplicate samples for quality control was at a rate of 1 per twenty samples.

Table 1 NRCS Soil Types Present On-Site

Former Baron's Estate Property

38E—Hinckley Loamy Sand Slopes: 15–45% 15.5 acres Coverage: 31.2%	Oe	0–1 in	moderately decomposed plant material
	A	1–8 in	loamy sand
	Bw1	8–11 in	gravelly loamy sand
	Bw2	11–16 in	gravelly loamy sand
	BC	16–19 in	very gravelly loamy sand
	C	19–65 in	very gravelly sand
38C—Hinckley Loamy Sand Slopes: 3–15% 12.3 acres Coverage: 24.9%	Oe	0–1 in	moderately decomposed plant material
	A	1–8 in	loamy sand
	Bw1	8–11 in	gravelly loamy sand
	Bw2	11–16 in	gravelly loamy sand
	BC	16–19 in	very gravelly loamy sand
	C	19–65 in	very gravelly sand
229B—Agawam-Urban Land Complex Slopes: 0–8% 11.9 acres Coverage: 24.1%	Ap	0–8 in	fine sandy loam
	Bw1	8–14 in	fine sandy loam
	Bw2	14–24 in	fine sandy loam
	2C	24–60 in	stratified very gravelly coarse sand to fine sand
307—Urban Land Slopes: n/a 7.3 acres Coverage: 14.8%	*Undefined Profile*		
29C—Agawam Fine Sandy Loam Slopes: 8–15% 1.7 acres Coverage: 3.4%	Ap	0–11 in	fine sandy loam
	Bw1	11–16 in	fine sandy loam
	Bw2	16–26 in	fine sandy loam
	2C1	26–45 in	loamy fine sand
	2C2	45–55 in	loamy fine sand
	2C3	55–60 in	loamy sand
306—Udorthents-Urban Land Complex Slopes: n/a 0.8 acres Coverage: 1.6%	A	0–5 in	loam
	C1	5–21 in	gravelly loam
	C2	21–80 in	very gravelly sandy loam

Note: From USDA Natural Resource Conservation Service (NRCS), 2020, State of Connecticut Soil Survey; See Appendix 1 for Site Area Soil Map

Data Review

2019 Dataset

To assess the soil stockpile, Thunderbird collected thirty (30) samples (see Table 1). Arsenic concentrations in these samples had the following descriptive statistics:

- Range—maximum 17.5 mg/kg
- 75th Percentile 12.75 mg/kg
- 95% Upper Confidence Limit (UCL) of Mean 11.3 mg/kg *[student's t-test*]*
- Mean 10.4 mg/kg
- Median 9.75 mg/kg
- Mode 11.0 mg/kg
- 25th Percentile 7.95 mg/kg
- Range—minimum 6.12 mg/kg

* NOTE—Data appear normally distributed, with no outliers.

2020 Dataset—XRF Data

Thunderbird collected samples at thirty-two (32) locations and five (5) depth intervals at the Site (see Table 3). The raw Arsenic dataset had the following descriptive statistics (all in mg/kg):

RAW XRF **INTERVAL (ft) →**	**0.0–0.25**	**0.25–0.5**	**0.5–1.0**	**1.0–2.0**	**2.0–3.0**
• Range—maximum	45	27	23	182	61
• 75th Percentile	23.5	14.3	11.4	11.1	10.3
• 95% UCL Mean*	21.5	13.8	11.2	15.2	11.8
• Mean	18.1	11.4	9.5	14.3	9.6
• Median	15.7	9.4	8.0	8.2	7.8
• Mode	8.3	8.5	7.2	7.4	7.8
• 25th Percentile	8.6	7.1	5.9	6.4	5.2
• Range—minimum	2.0	2.0	3.3	3.1	3.7
* Types of Distribution:	Normal	Gamma	Gamma	Log-Normal	Gamma
* Number of Outliers: (using Rosner's Test)	None	None	Three	One	One

Some of the depth intervals in the raw dataset had outliers based on the Rosner Outlier Test:

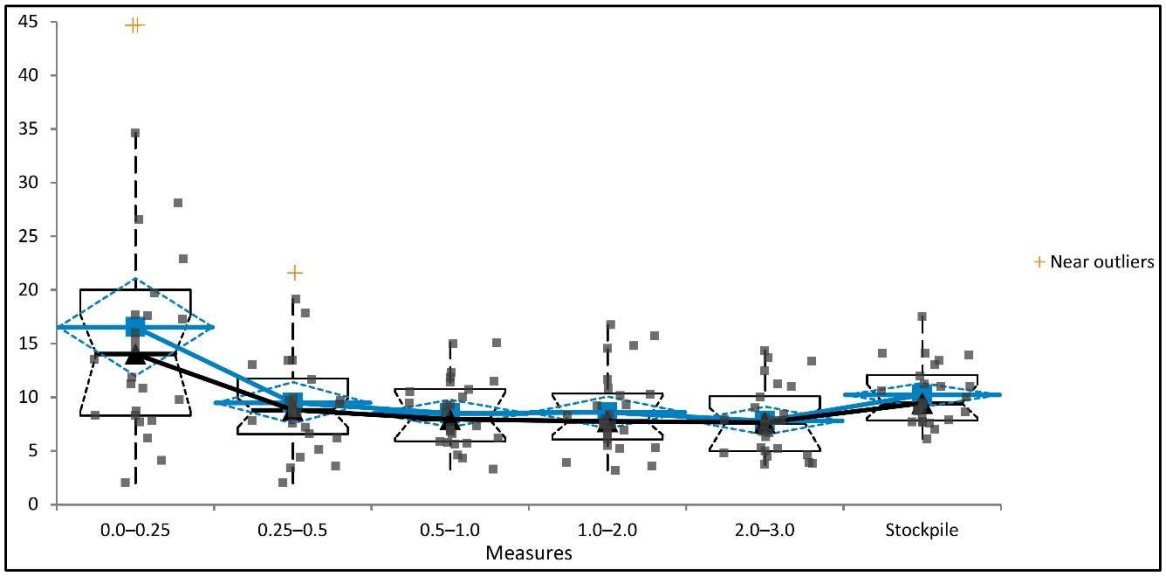
- Interval 0.5-1.0 ft—three outliers 22.8, 22.5, & 22.5 @1% significance level
- Interval 1.0-2.0 ft—one outlier 182 @1% significance level
- Interval 2.0-3.0 ft—one outlier 61 @1% significance level

Therefore, we trimmed the raw dataset (see colored numbers in Table 3) to remove identified outliers and subsequently re-computed the descriptive statistics (all in mg/kg):

TRIMMED **INTERVAL (ft) →**	**0.0–0.25**	**0.25–0.5**	**0.5–1.0**	**1.0–2.0**	**2.0–3.0**
• Range—maximum	45	27	15.1	20	14.4
• 75th Percentile	23.5	14.3	10.5	10.9	9.8
• 95% UCL Mean*	21.5	13.8	9.2	10.2	8.9
• Mean	18.1	11.4	8.1	8.9	7.9
• Median	15.7	9.4	7.2	8.0	7.8
• Mode	8.3	8.5	7.2	7.4	7.8
• 25th Percentile	8.6	7.1	5.8	6.3	5.1
• Range—minimum	2.0	2.0	3.3	3.1	3.7
* Types of Distribution:	Normal	Gamma	Normal	Normal	Normal

Appendix 2 contains the details of the statistical analysis of these data.

Comparing the depth interval data to the stockpile data results in the following graph.



Comparative Box-Whisker/Diamond Plots

Note: Box = 25%-Median-75% Whiskers = Minimum & Maximum Extent [Outliers are +] Diamond = Mean with 95% confidence intervals).

Our review of these data and their descriptive statistics lead us to the following findings:

- The soil Arsenic data have a central tendency around 10 mg/kg, except surficial soil (0.0-0.25 ft) which is 21.5 mg/kg. Near surface soil (interval 0.25-0.5 ft) has an upper 95% confidence level mean (95%-UCL) of 13.8 mg/kg.
- Deeper intervals (below 0.5 feet or 6 inches) have a mean concentration (including its 95%-UCL) less than 10 mg/kg, except for the 1-2 foot interval which is at 10.2 mg/kg.
- These results lead us to conclude that the *naturally occurring background* concentration of Arsenic soil at this Site is around 10 mg/kg, and generally meet the definition of background in comparison to the CT-DEEP definition. These values similarly meet the R-DEC and I/C-DEC criteria to protect people from exposure.

Looking at the entire raw dataset of Arsenic concentrations in soil and ranking them from highest to lowest (see Table 3) we can identify sample locations that might be more likely to have a higher concentration compared to other locations. Location TB-2 (intervals 1.0-2.0 and 2.0-3.0 ft, see Figure 2 for location) appears to have higher Arsenic concentration than others. It is unclear to us why this might be the case. Samples from shallower intervals with concentrations ranging between 20-50 mg/kg are more frequent:

- 11 Samples from Interval 0.0–0.25 ft
- 4 Samples from Interval 0.25–0.5 ft
- 3 Samples from Interval 0.5–1.0 ft
- 1 Sample from Interval 1.0–2.0 ft

Anthropogenic Background Chemicals, perhaps arsenical pesticides which were commonly used between 1900 and the 1960s, might contribute to the elevated Arsenic concentration in shallow (surficial) soils.

Figures

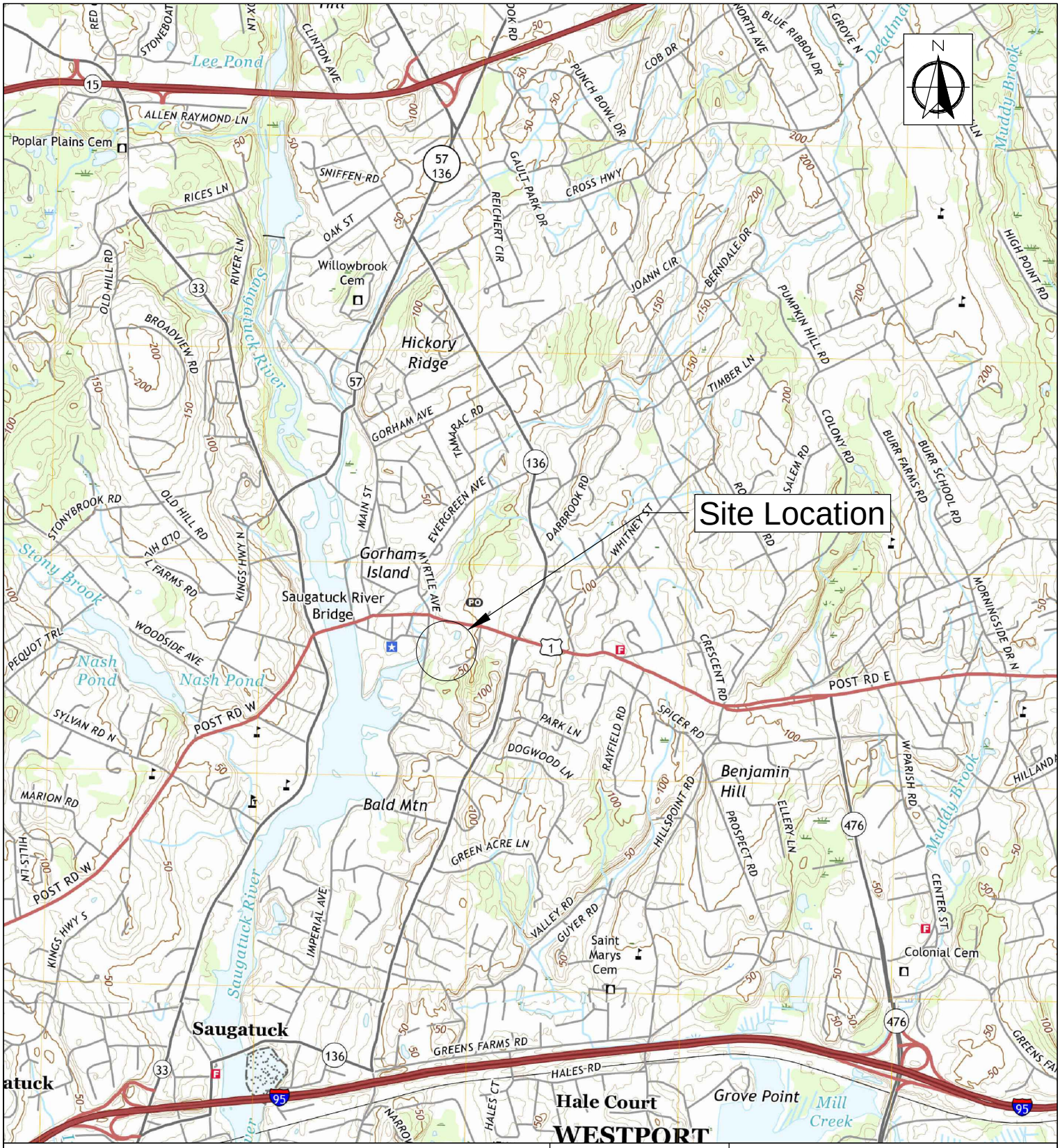
1. Site Layout
2. Background Assessment Sample Locations (Thunderbird 2020)
3. Arsenic in Soil Quantile-Quantile (Q–Q) Plots for Different Depth Intervals

Tables

1. Soil Stockpile Analytical Results (Thunderbird 2019)
2. Background Assessment Soil Arsenic Dataset (Thunderbird 2020)
3. Sample Ranking by Arsenic Concentration (Thunderbird 2020)

Appendices

1. Soil Map
2. Soil Data Statistics and Distribution Plots



THUNDERBIRD ENVIRONMENTAL

14 Leffingwell Road
Clinton, Connecticut 06413
ph: (860) 227-4714
web: tbirdenv.com

Site Location:

21 Imperial Avenue and 52, 52A, 68, 70, 72 Compo Road South, CT

Project Number:

2019_096

Topographic Map Source

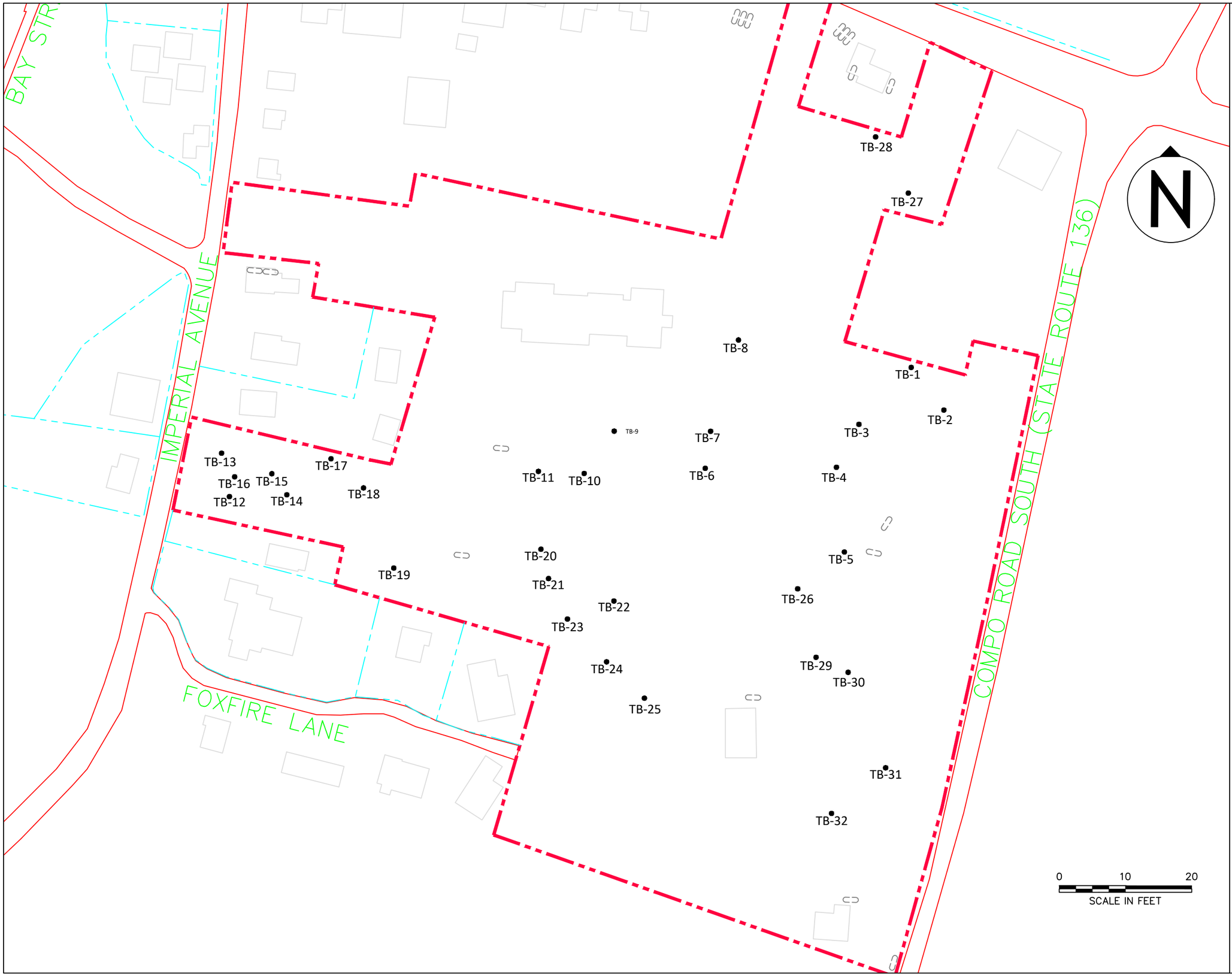
State: Connecticut

USGS 7.5' Quadrangle: Westport

Year: 2018

Scale: 1:2000

FIGURE 1
Site Location Map



Legend

- PROPERTY LINE
- SITE BOUNDARY
- SOIL BORING

Notes:

Soil sample locations depicted on this figure are approximated. This figure is not intended for construction purposes.

14 Leffingwell Road
Clinton, Connecticut 06413
ph: (860) 227-4714
web: tbirdenv.com

Supplemental Soil Sampling Locations

Site Map

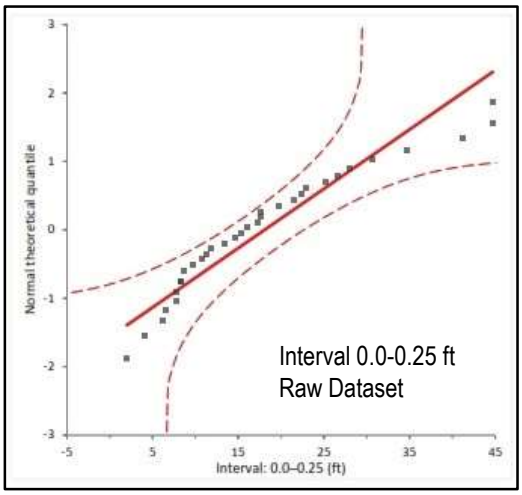
Site Address:
21 Imperial Avenue and 52, 52A, 68, 70, 72 Compo Road South, CT

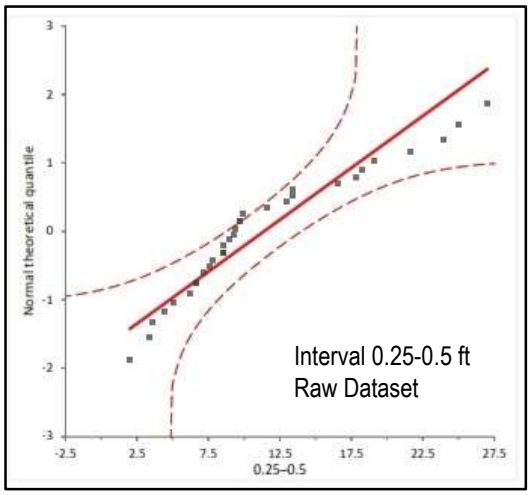
Project Number:	Drawn By:
2019_096	ICD

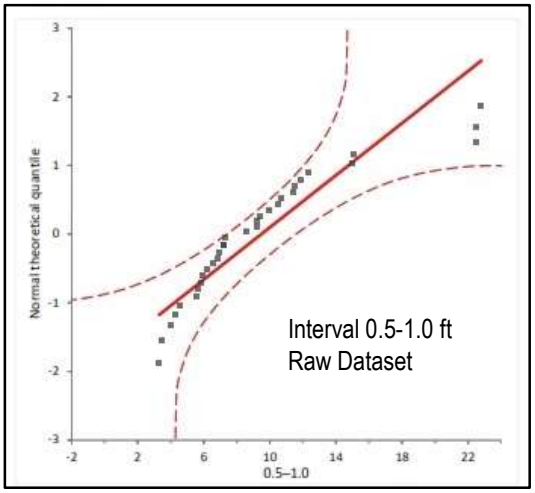
Date:	Scale:
2/26/2020	As Shown

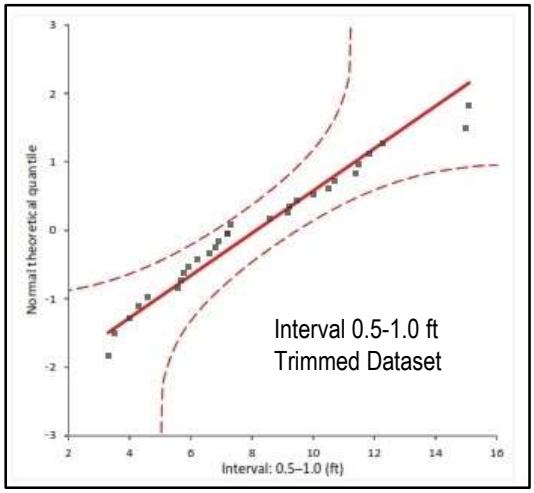
FIGURE 2

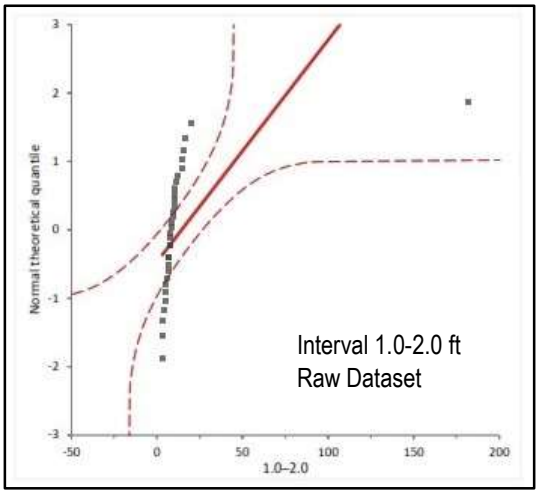
Figure 2 Arsenic in Soil Quantile-Quantile (Q–Q) Plots for Different Depth Intervals (Raw & Trimmed Datasets)

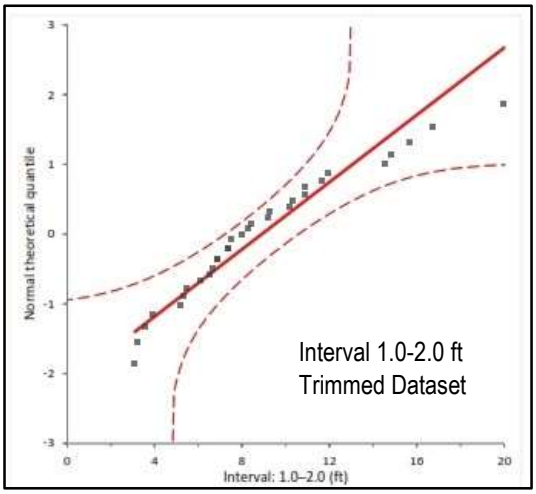


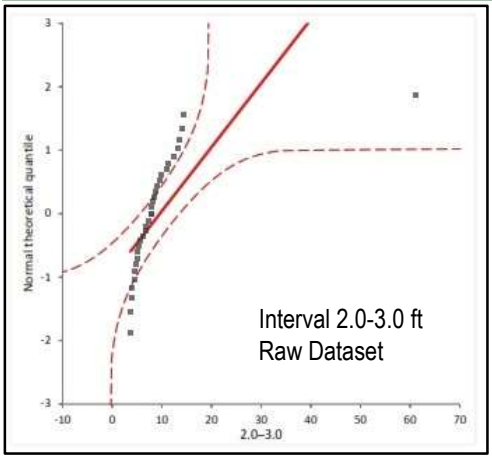











Normal theoretical quantile
3
2
1
0
-1
-2
-3
-10
0
10
20
30
40
50
60
70
2.0–3.0
Interval 2.0-3.0 ft
Raw Dataset

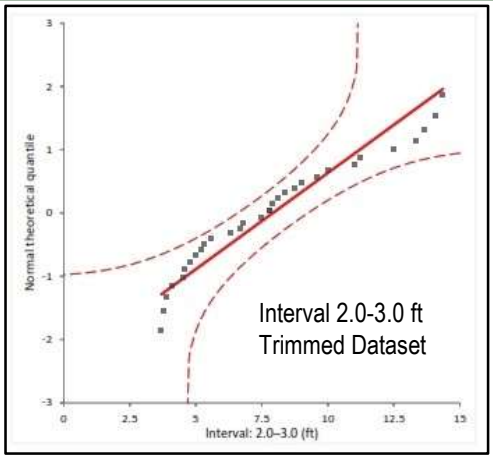

Normal theoretical quantile
3
2
1
0
-1
-2
-3
0
2.5
5
7.5
10
12.5
15
Interval: 2.0–3.0 (ft)
Interval 2.0-3.0 ft
Trimmed Dataset

Table 1
Summary of Soil Analytical Results
Westport Center for Senior Activities
21 Imperial Avenue
Westport, CT

Parameter	RES DEC	I/C DEC	GA PMC									
Sample I.D.				TP-1	TP-2	TP-3	TP-4	TP-5A	TP-5B	TP-5C	TP-5D	TP-6A	TP-6B
Sampling Date				5/6/2019	5/6/2019	5/6/2019	5/6/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019
Sample Depth (feet)				(0-7)	(0-7)	(0-7)	(0-7)	(0-5.5)	(0-5.5)	(0-5.5)	(0-5.5)	(0-4)	(0-4)
Extractable Total Petroleum Hydrocarbons (mg/kg)													
ETPH	**500**	**2,500**	**500**	ND < 59	ND < 58	ND < 60	ND < 59	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls (PCBs)													
Various PCBs	**1**	**10**	**NE**	ND < 0.12	ND < 0.12	ND < 0.12	ND < 0.12	NA	NA	NA	NA	NA	NA
Total Metals (mg/kg)													
Arsenic	**10**	**10**	**NE**	**6.8**	**7.0**	**8.7**	**13**	**13.7**	**13.4**	**13.9**	**11.0**	**12.0**	**11.2**
Beryllium	**2**	**2**	**NE**	ND < 1.1	ND < 1.2	ND < 1.2	ND < 1.2	NA	NA	NA	NA	NA	NA
Cadmium	**34**	**1,000**	**NE**	ND < 0.55	ND < 0.58	ND < 0.60	ND < 0.60	NA	NA	NA	NA	NA	NA
Chromium	**100**	**100**	**NE**	**21**	**23**	**28**	**27**	NA	NA	NA	NA	NA	NA
Copper	**2,500**	**76,000**	**NE**	**14**	**13**	**17**	**18**	NA	NA	NA	NA	NA	NA
Lead	**400**	**1,000**	**NE**	**38**	**32**	**56**	**50**	NA	NA	NA	NA	NA	NA
Mercury	**20**	**610**	**NE**	ND < 0.14	ND < 0.15	ND < 0.16	ND < 0.15	NA	NA	NA	NA	NA	NA
Nickel	**1,400**	**7,500**	**NE**	**12**	**13**	**14**	**13**	NA	NA	NA	NA	NA	NA
Selenium	**340**	**10,000**	**NE**	**1.5**	**1.9**	**2.2**	**2.0**	NA	NA	NA	NA	NA	NA
Zinc	**20,000**	**610,000**	**NE**	**53**	**52**	**64**	**61**	NA	NA	NA	NA	NA	NA
SPLP Metals (mg/l)													
Arsenic	**NE**	**NE**	**0.05**	NA	NA	NA	NA	NA	NA	**0.005**	NA	NA	NA
Pesticides (µg/kg)													
4,4' -DDD	**1,800***	**17,000***	**3***	ND < 5.9	ND < 5.8	**19**	**35**	**61**	NA	NA	NA	ND < 40	NA
4,4' -DDE	**1,800***	**17,000***	**3***	**11**	**11**	**35**	**66**	**40**	NA	NA	NA	ND < 65	NA
4,4' -DDT	**1,800***	**17,000***	**3***	**13**	**23**	**57**	**61**	**740**	NA	NA	NA	ND < 35	NA
Chlordane	**490**	**2,200**	**66**	ND < 35	ND < 35	ND < 36	ND < 35	**57**	NA	NA	NA	ND < 76	NA
Heptachlor epoxide	**67**	**630**	**20**	ND < 5.9	ND < 5.8	ND < 6.0	ND < 5.9	ND < 7.6	NA	NA	NA	ND < 19	NA
SPLP Pesticides (µg/kg)													
Various	**VARIOUS**	**VARIOUS**	**VARIOUS**	NA	NA	NA	NA	ND < 0.19	NA	NA	NA	NA	NA
Aromatic Volative Organic Compounds (µg/kg)													
Toluene	**500,000**	**1,000,000**	**20,000**	ND < 3.2	ND < 3.2	**6.2**	**33**	NA	NA	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Benzo(a)anthracene	**1,000**	**7,800**	**1,000**	ND < 350	ND < 350	**430**	ND < 350	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	**1,000**	**1,000**	**1,000**	ND < 350	ND < 350	**390**	ND < 350	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	**1,000**	**7,800**	**1,000**	ND < 350	ND < 350	**470**	ND < 350	NA	NA	NA	NA	NA	NA
Chrysene	**84,000***	**780,000***	**1,000***	ND < 350	ND < 350	**400**	ND < 350	NA	NA	NA	NA	NA	NA
Fluoranthene	**1,000,000**	**2,500,000**	**5,600**	ND < 350	**450**	**840**	**700**	NA	NA	NA	NA	NA	NA
Pyrene	**1,000,000**	**2,500,000**	**4,000**	ND < 350	**480**	**730**	**630**	NA	NA	NA	NA	NA	NA

Notes:

1. RES DEC = Residential Direct Exposure Criteria
2. I/C DEC = Industrial/Commercial Direct Exposure Criteria
3. GA PMC = GA Pollutant Mobility Criteria
4. mg/kg = milligrams per kilogram, µg/kg = micrograms per kilogram, per liter, mg/l = milligrams per liter
5. NA = Not Analyzed
6. NE = No Established Criteria
7. ND = Not Detected above Laboratory Reporting Limit
8. Bolded values indicate parameter detected at concentration above the Laboratory Reporting Limit (RL)
9. Shaded values indicate exceedance of applicable RSR Criteria
10. * = CTDEEP approval required for use of Additional Polluting Substance (APS) Criteria

Table 1
Summary of Soil Analytical Results
Westport Center for Senior Activities
21 Imperial Avenue
Westport, CT

Parameter	RES DEC	I/C DEC	GA PMC									
Sample I.D.				TP-6C	TP-6D	TP-7A	TP-7B	TP-7C	TP-7D	TP-8A	TP-8B	TP-8C	TP-8D
Sampling Date				12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019	12/13/2019
Sample Depth (feet)				(0-4)	(0-4)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)
Extractable Total Petroleum Hydrocarbons (mg/kg)													
ETPH	**500**	**2,500**	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls (PCBs)													
Various PCBs	**1**	**10**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (mg/kg)													
Arsenic	**10**	**10**	**NE**	**12.0**	**11.0**	**6.12**	**7.75**	**7.68**	**7.60**	**7.86**	**10.0**	**9.34**	**8.88**
Beryllium	**2**	**2**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	**34**	**1,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	**100**	**100**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	**2,500**	**76,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	**400**	**1,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	**20**	**610**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	**1,400**	**7,500**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	**340**	**10,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	**20,000**	**610,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Metals (mg/l)													
Arsenic	**NE**	**NE**	**0.05**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (µg/kg)													
4,4' -DDD	**1,800***	**17,000***	**3***	NA	NA	**15**	NA	NA	NA	ND < 1.5	NA	NA	NA
4,4' -DDE	**1,800***	**17,000***	**3***	NA	NA	**29**	NA	NA	NA	ND < 11	NA	NA	NA
4,4' -DDT	**1,800***	**17,000***	**3***	NA	NA	**14**	NA	NA	NA	ND < 8	NA	NA	NA
Chlordane	**490**	**2,200**	**66**	NA	NA	**60**	NA	NA	NA	ND < 37	NA	NA	NA
Heptachlor epoxide	**67**	**630**	**20**	NA	NA	ND < 7.1	NA	NA	NA	ND < 7.5	NA	NA	NA
SPLP Pesticides (µg/kg)													
Various	**VARIOUS**	**VARIOUS**	**VARIOUS**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Volative Organic Compounds (µg/kg)													
Toluene	**500,000**	**1,000,000**	**20,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Benzo(a)anthracene	**1,000**	**7,800**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	**1,000**	**1,000**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	**1,000**	**7,800**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	**84,000***	**780,000***	**1,000***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	**1,000,000**	**2,500,000**	**5,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	**1,000,000**	**2,500,000**	**4,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. RES DEC = Residential Direct Exposure Criteria
2. I/C DEC = Industrial/Commercial Direct Exposure Criteria
3. GA PMC = GA Pollutant Mobility Criteria
4. mg/kg = milligrams per kilogram, µg/kg = micrograms per kilogram, per liter, mg/l = milligrams per liter
5. NA = Not Analyzed
6. NE = No Established Criteria
7. ND = Not Detected above Laboratory Reporting Limit
8. Bolded values indicate parameter detected at concentration above the Laboratory Reporting Limit (RL)
9. Shaded values indicate exceedance of applicable RSR Criteria
10. * = CTDEEP approval required for use of Additional Polluting Substance (APS) Criteria

Table 1
Summary of Soil Analytical Results
Westport Center for Senior Activities
21 Imperial Avenue
Westport, CT

Parameter	RES DEC	I/C DEC	GA PMC									
Sample I.D.				TP-9A	TP-9B	TP-9C	TP-9D	TP-9E	TP-10A	TP-10B	TP-10C	TP-10D	TP-10E
Sampling Date				1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020	1/3/2020
Sample Depth (feet)				(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)	(0-5)
Extractable Total Petroleum Hydrocarbons (mg/kg)													
ETPH	**500**	**2,500**	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls (PCBs)													
Various PCBs	**1**	**10**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (mg/kg)													
Arsenic	**10**	**10**	**NE**	**17.5**	**14.1**	**14.1**	**13.9**	**9.54**	**8.09**	**10.6**	**8.67**	**8.96**	**7.7**
Beryllium	**2**	**2**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	**34**	**1,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	**100**	**100**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	**2,500**	**76,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	**400**	**1,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	**20**	**610**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	**1,400**	**7,500**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	**340**	**10,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	**20,000**	**610,000**	**NE**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Metals (mg/l)													
Arsenic	**NE**	**NE**	**0.05**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (µg/kg)													
4,4' -DDD	**1,800***	**17,000***	**3***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4' -DDE	**1,800***	**17,000***	**3***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4' -DDT	**1,800***	**17,000***	**3***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	**490**	**2,200**	**66**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	**67**	**630**	**20**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Pesticides (µg/kg)													
Various	**VARIOUS**	**VARIOUS**	**VARIOUS**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Volative Organic Compounds (µg/kg)													
Toluene	**500,000**	**1,000,000**	**20,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Benzo(a)anthracene	**1,000**	**7,800**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	**1,000**	**1,000**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	**1,000**	**7,800**	**1,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	**84,000***	**780,000***	**1,000***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	**1,000,000**	**2,500,000**	**5,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	**1,000,000**	**2,500,000**	**4,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. RES DEC = Residential Direct Exposure Criteria
2. I/C DEC = Industrial/Commercial Direct Exposure Criteria
3. GA PMC = GA Pollutant Mobility Criteria
4. mg/kg = milligrams per kilogram, µg/kg = micrograms per kilogram, per liter, mg/l = milligrams per liter
5. NA = Not Analyzed
6. NE = No Established Criteria
7. ND = Not Detected above Laboratory Reporting Limit
8. Bolded values indicate parameter detected at concentration above the Laboratory Reporting Limit (RL)
9. Shaded values indicate exceedance of applicable RSR Criteria
10. * = CTDEEP approval required for use of Additional Polluting Substance (APS) Criteria

Table 2 Background Assessment Arsenic in Soil Dataset
Former Baron's Estate Site

Sample		XRF Data				Laboratory Analysis	
ID #	Interval (ft)	Arsenic Detection	Arsenic Detection #2	Arsenic Detection #3	Average	Lab Id	Arsenic (mg/kg)
TB-1	0.0–0.25	7.7			7.7		
	0.25–0.5	8.5			8.5	CF70433	5.34
	0.5–1.0	5.6			5.6		
	1.0–2.0	7.4			7.4		
	2.0–3.0	6.7			6.7		
TB-2	0.0–0.25	6.6			6.6		
	0.25–0.5	6.6			6.6		
	0.5–1.0	3.5			3.5		
	1.0–2.0	165	185	196	182	CF70434	182.00
	2.0–3.0	51.8	90.0	41.2	61	CF70435	11.00
TB-3	0.0–0.25	14.6	20.6		17.6	CF70436	12.80
	0.25–0.5	16.0	19.7		17.9		
	0.5–1.0	10.7	9.3		10		
	1.0–2.0	10.2	10.1		10.2		
	2.0–3.0	11	11.5		11.3		
TB-4	0.0–0.25	12.0	9.7		10.9		
	0.25–0.5	4.4			4.4		
	0.5–1.0	4.6			4.6		
	1.0–2.0	3.2			3.2		
	2.0–3.0	7.8			7.8		
TB-5	0.0–0.25	19	13		16		
	0.25–0.5	9.3			9.3		
	0.5–1.0	13.9	9.8		11.9	CF70437	8.86
	1.0–2.0	6.5			6.5		
	2.0–3.0	8.1			8.1		
Dup-1	2.0–3.0	7.0			7		
TB-6	0.0–0.25	2.0			2		
	0.25–0.5	2.0			2		
	0.5–1.0	5.9			5.9		
	1.0–2.0	9.2			9.2		
	2.0–3.0	9.0			9		
TB-7	0.0–0.25	8.3			8.3		
	0.25–0.5	10.0	7.0		8.5		
	0.5–1.0	7.2			7.2		
	1.0–2.0	6.9			6.9		
	2.0–3.0	5.0			5		
TB-8	0.0–0.25	4.1			4.1	CF70438	4.63
	0.25–0.5	5.1			5.1		
	0.5–1.0	7.3			7.3		
	1.0–2.0	13.2	16.4		14.8		
	2.0–3.0	12.0	10.0		11		
TB-9	0.0–0.25	10.8	18.4		14.6		
	0.25–0.5	8.6			8.6		
	0.5–1.0	12.2	10.6		11.4		
	1.0–2.0	12.7	16.4		14.6		
	2.0–3.0	12.9	15.8		14.4		
Dup-2	0.5–1.0	11.8	8.6		10.2		

Table 2 Background Assessment Arsenic in Soil Dataset
Former Baron's Estate Site

Sample		XRF Data				Laboratory Analysis	
ID #	Interval (ft)	Arsenic Detection	Arsenic Detection #2	Arsenic Detection #3	Average	Lab Id	Arsenic (mg/kg)
TB-10	0.0–0.25	29.2	27.0		28.1		
	0.25–0.5	3.6			3.6		
	0.5–1.0	3.3			3.3		
	1.0–2.0	16.3	4.3		10.3		
	2.0–3.0	4.6			4.6		
TB-11	0.0–0.25	10.2	12.3		11.3		
	0.25–0.5	13.5	13.3		13.4		
	0.5–1.0	8.6			8.6		
	1.0–2.0	7.5			7.5		
	2.0–3.0	11.1	8.9		10	CF70439	9.34
Dup-3	1.0–2.0	7.2			7.2		
TB-12	0.0–0.25	10.8	12.9		11.9		
	0.25–0.5	9.7			9.7		
	0.5–1.0	10.4	8.0		9.2		
	1.0–2.0	7.4			7.4		
	2.0–3.0	5.3			5.3		
TB-13	0.0–0.25	35.0	31.0	38.0	34.7		
	0.25–0.5	7.6			7.6		
	0.5–1.0	6.9			6.9		
	1.0–2.0	6.1			6.1		
	2.0–3.0	7.5			7.5		
Dup-4	2.0–3.0	7.9			7.9		
TB-14	0.0–0.25	8.7			8.7		
	0.25–0.5	9.9			9.9		
	0.5–1.0	13.3	11.3		12.3		
	1.0–2.0	11.2	10.5		10.9		
	2.0–3.0	6.3			6.3	CF70440	4.66
TB-15	0.0–0.25	17.9	17.4		17.7		
	0.25–0.5	13.8	13.1		13.5		
	0.5–1.0	10.8	7.7		9.3		
	1.0–2.0	5.5			5.5		
	2.0–3.0	3.7			3.7		
TB-16	0.0–0.25	12.4	7.1		9.8		
	0.25–0.5	6.2			6.2		
	0.5–1.0	17.5	5.5		11.5		
	1.0–2.0	3.6			3.6		
	2.0–3.0	3.9			3.9		
TB-17	0.0–0.25	13.0	14.0		13.5		
	0.25–0.5	7.8			7.8		
	0.5–1.0	10.1	8.8		9.5	CF70441	7.39
	1.0–2.0	3.9			3.9		
	2.0–3.0	4.8			4.8		
Dup-5	0.5–1.0	7.5			7.5		
TB-18	0.0–0.25	17.7	21.8		19.8		
	0.25–0.5	11.5	11.8		11.7		
	0.5–1.0	13.0	8.4		10.7	CF70442	7.86
	1.0–2.0	9.3			9.3		
	2.0–3.0	8.4			8.4		

Table 2 Background Assessment Arsenic in Soil Dataset
Former Baron's Estate Site

Sample		XRF Data				Laboratory Analysis	
ID #	Interval (ft)	Arsenic Detection	Arsenic Detection #2	Arsenic Detection #3	Average	Lab Id	Arsenic (mg/kg)
TB-19	0.0–0.25	23.0	22.8		22.9		
	0.25–0.5	11.7	7.7		9.7		
	0.5–1.0	6.2			6.2		
	1.0–2.0	5.3			5.3		
	2.0–3.0	3.8			3.8		
TB-20	0.0–0.25	40.1	51.0	43.0	44.7	CF70443	42.80
	0.25–0.5	17.6	25.6		21.6		
	0.5–1.0	6.6			6.6		
	1.0–2.0	8.4			8.4		
	2.0–3.0	4.5			4.5		
TB-21	0.0–0.25	34.0	30.0	70.0	44.7		
	0.25–0.5	3.4			3.4		
	0.5–1.0	5.8			5.8		
	1.0–2.0	8.0			8.0		
	2.0–3.0	6.8			6.8		
Dup-6	1.0–2.0	5.3			5.3		
TB-22	0.0–0.25	33.1	28.0	31.0	30.7	CF70444	28.60
	0.25–0.5	21.2	15.4		18.3		
	0.5–1.0	23.9	21.0		22.5		
	1.0–2.0	12.5	11.4		12.0		
	2.0–3.0	9.6			9.6		
TB-23	0.0–0.25	6.2			6.2		
	0.25–0.5	7.2			7.2		
	0.5–1.0	4.3			4.3		
	1.0–2.0	5.2			5.2		
	2.0–3.0	5.2			5.2		
TB-24	0.0–0.25	7.8			7.8		
	0.25–0.5	6.6			6.6	CF70445	5.46
	0.5–1.0	5.7			5.7	CF70446	5.88
	1.0–2.0	6.9			6.9		
	2.0–3.0	7.8			7.8		
TB-25	0.0–0.25	52.0	33.5	38.0	41.2		
	0.25–0.5	24.3	29.7		27.0		
	0.5–1.0	26	19.6		22.8		
	1.0–2.0	10.3	11.4		10.9		
	2.0–3.0	10.0	7.5		8.8		
Dup-7	2.0–3.0	8			8.0		
TB-26	0.0–0.25	16.1	18.5		17.3		
	0.25–0.5	10.7	8		9.4		
	0.5–1.0	13.9	16.3		15.1		
	1.0–2.0	14.2	17.2		15.7		
	2.0–3.0	14.1	12.6		13.4		
TB-27	0.0–0.25	21	22		21.5		
	0.25–0.5	27	21		24.0		
	0.5–1.0	22	23		22.5		
	1.0–2.0	22	18		20.0	CF70447	14.60
	2.0–3.0	15.9	12.3		14.1		

Table 2 Background Assessment Arsenic in Soil Dataset
Former Baron's Estate Site

Sample		XRF Data				Laboratory Analysis	
ID #	Interval (ft)	Arsenic Detection	Arsenic Detection #2	Arsenic Detection #3	Average	Lab Id	Arsenic (mg/kg)
TB-28	0.0–0.25	8.3			8.3		
	0.25–0.5	12.0	14.0		13.0		
	0.5–1.0	12.0	9.0		10.5	CF70448	9.58
	1.0–2.0	8.3			8.3		
	2.0–3.0	7.9			7.9		
TB-29	0.0–0.25	23.5	31.0	25.2	26.6	CF70449	24.20
	0.25–0.5	14.1	24.2		19.2		
	0.5–1.0	14.9	15.1		15.0		
	1.0–2.0	15.3	18.2		16.8		
	2.0–3.0	13.8	13.5		13.7		
TB-30	0.0–0.25	14.6	16.2		15.4		
	0.25–0.5	12.5	5.5		9.0	CF70450	11.10
	0.5–1.0	6.8			6.8		
	1.0–2.0	10.9	12.4		11.7		
	2.0–3.0	13.1	11.9		12.5		
Dup-8	0.25–0.5	6.5			6.5		
TB-31	0.0–0.25	30.0	23.1	22.3	25.1		
	0.25–0.5	26.5	6.7		16.6	CF70451	22.20
	0.5–1.0	7.2			7.2		
	1.0–2.0	6.7			6.7		
	2.0–3.0	5.6			5.6		
TB-32	0.0–0.25	26.0	18.9		22.5		
	0.25–0.5	29.0	21.0		25.0		
	0.5–1.0	4.0			4.0		
	1.0–2.0	3.1			3.1	CF70452	3.58
	2.0–3.0	4.1			4.1		

Source: Thunderbird Environmental, LLC Data, 2020

Note: Yellow highlight indicates values removed from Raw Dataset to produce Trimmed Dataset

Table 3 Sample Ranking by Arsenic Concentration
Former Baron's Estate Site

Rank	ID	Arsenic
1	TB-2	182
2	TB-2	61.0
3	TB-20	44.7
4	TB-21	44.7
5	TB-25	41.2
6	TB-13	34.7
7	TB-22	30.7
8	TB-10	28.1
9	TB-25	27.0
10	TB-29	26.6
11	TB-31	25.1
12	TB-32	25.0
13	TB-27	24.0
14	TB-19	22.9
15	TB-25	22.8
16	TB-27	22.5
17	TB-32	22.5
18	TB-22	22.5
19	TB-20	21.6
20	TB-27	21.5
21	TB-27	20.0
22	TB-18	19.8
23	TB-29	19.2
24	TB-22	18.3
25	TB-3	17.9
26	TB-15	17.7
27	TB-3	17.6
28	TB-26	17.3
29	TB-29	16.8
30	TB-31	16.6
31	TB-5	16
32	TB-26	15.7
33	TB-30	15.4
34	TB-26	15.1
35	TB-29	15.0
36	TB-8	14.8
37	TB-9	14.6
38	TB-9	14.6
39	TB-9	14.4
40	TB-27	14.1
41	TB-29	13.7
42	TB-17	13.5
43	TB-15	13.5
44	TB-11	13.4
45	TB-26	13.4
46	TB-28	13.0
47	TB-30	12.5
48	TB-14	12.3
49	TB-22	12.0
50	TB-12	11.9
51	TB-5	11.9
52	TB-18	11.7
53	TB-30	11.7
54	TB-16	11.5
55	TB-9	11.4
56	TB-11	11.3
57	TB-3	11.3
58	TB-8	11.0
59	TB-25	10.9
60	TB-4	10.9
61	TB-14	10.9
62	TB-18	10.7
63	TB-28	10.5
64	TB-10	10.3
65	TB-3	10.2
66	TB-3	10
67	TB-11	10.0
68	TB-14	9.9
69	TB-16	9.8
70	TB-12	9.7
71	TB-19	9.7
72	TB-22	9.6
73	TB-17	9.5
74	TB-26	9.4
75	TB-5	9.3
76	TB-18	9.3
77	TB-15	9.3
78	TB-12	9.2
79	TB-6	9.2
80	TB-30	9.0
81	TB-6	9.0
82	TB-25	8.8
83	TB-14	8.7
84	TB-9	8.6
85	TB-11	8.6
86	TB-1	8.5
87	TB-7	8.5
88	TB-20	8.4
89	TB-18	8.4
90	TB-7	8.3
91	TB-28	8.3
92	TB-28	8.3
93	TB-5	8.1
94	TB-21	8.0
95	TB-28	7.9
96	TB-24	7.8
97	TB-17	7.8
98	TB-4	7.8
99	TB-24	7.8
100	TB-1	7.7
101	TB-13	7.6
102	TB-11	7.5
103	TB-13	7.5
104	TB-1	7.4
105	TB-12	7.4
106	TB-8	7.3
107	TB-23	7.2
108	TB-7	7.2
109	TB-31	7.2
110	TB-13	6.9
111	TB-7	6.9
112	TB-24	6.9
113	TB-30	6.8
114	TB-21	6.8
115	TB-31	6.7
116	TB-1	6.7
117	TB-2	6.6
118	TB-2	6.6
119	TB-24	6.6
120	TB-20	6.6
121	TB-5	6.5
122	TB-14	6.3
123	TB-23	6.2
124	TB-16	6.2
125	TB-19	6.2
126	TB-13	6.1
127	TB-6	5.9
128	TB-21	5.8
129	TB-24	5.7
130	TB-1	5.6
131	TB-31	5.6
132	TB-15	5.5
133	TB-19	5.3
134	TB-12	5.3
135	TB-23	5.2
136	TB-23	5.2
137	TB-8	5.1
138	TB-7	5.0
139	TB-17	4.8
140	TB-4	4.6
141	TB-10	4.6
142	TB-20	4.5
143	TB-4	4.4
144	TB-23	4.3
145	TB-8	4.1
146	TB-32	4.1
147	TB-32	4.0
148	TB-17	3.9
149	TB-16	3.9
150	TB-19	3.8
151	TB-15	3.7
152	TB-10	3.6
153	TB-16	3.6
154	TB-2	3.5
155	TB-21	3.4
156	TB-10	3.3
157	TB-4	3.2
158	TB-32	3.1
159	TB-6	2.0
160	TB-6	2.0

Key: Depth Interval (feet)

0.0–0.25
0.25–0.5
0.5–1.0
1.0–2.0
2.0–3.0

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

February 18, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
29C	Agawam fine sandy loam, 8 to 15 percent slopes	1.7	3.4%
38C	Hinckley loamy sand, 3 to 15 percent slopes	12.3	24.9%
38E	Hinckley loamy sand, 15 to 45 percent slopes	15.5	31.2%
229B	Agawam-Urban land complex, 0 to 8 percent slopes	11.9	24.1%
306	Udorthents-Urban land complex	0.8	1.6%
307	Urban land	7.3	14.8%
Totals for Area of Interest		**49.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

29C—Agawam fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqy
Elevation: 0 to 360 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Agawam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Moraines, outwash plains, kame terraces, kames, outwash terraces
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Crest, side slope, tread, riser, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Moraines, outwash plains, kames, outwash terraces, eskers
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ninigret

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

38C—Hinckley loamy sand, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svmb
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Footslope, toeslope, shoulder, backslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread

Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, linear, convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Moraines, outwash terraces, eskers, kames, kame terraces, outwash plains, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear, convex, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, kames, moraines, outwash plains, eskers
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, toeslope, summit, footslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: No

38E—Hinckley loamy sand, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 2svmj
Elevation: 0 to 1,280 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, eskers, kames, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, concave, convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Eskers, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash deltas, moraines, outwash terraces, eskers, kames, kame terraces, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Convex, linear, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, eskers, kames, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Kame terraces, outwash plains, outwash deltas, outwash terraces, eskers, kames, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: No

229B—Agawam-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lkd
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Agawam and similar soils: 40 percent
Urban land: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 14 inches: fine sandy loam
Bw2 - 14 to 24 inches: fine sandy loam
2C - 24 to 60 inches: stratified very gravelly coarse sand to fine sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile
H - 0 to 6 inches: material

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Walpole
Percent of map unit: 5 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Hinckley
Percent of map unit: 5 percent
Landform: Terraces, outwash plains, kames, eskers
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Udorthents
Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Merrimac
Percent of map unit: 5 percent
Landform: Terraces, outwash plains, kames
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scarboro
Percent of map unit: 3 percent
Landform: Terraces, depressions, drainageways
Down-slope shape: Concave

Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, red parent material
Percent of map unit: 2 percent
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting
National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile
A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities
Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile
H - 0 to 6 inches: material

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils
Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum
Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop
Percent of map unit: 2 percent
Hydric soil rating: No

307—Urban land

Map Unit Setting
National map unit symbol: 9lmh
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile
H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 10 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 10 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Distribution: Interval: 0.0–0.25

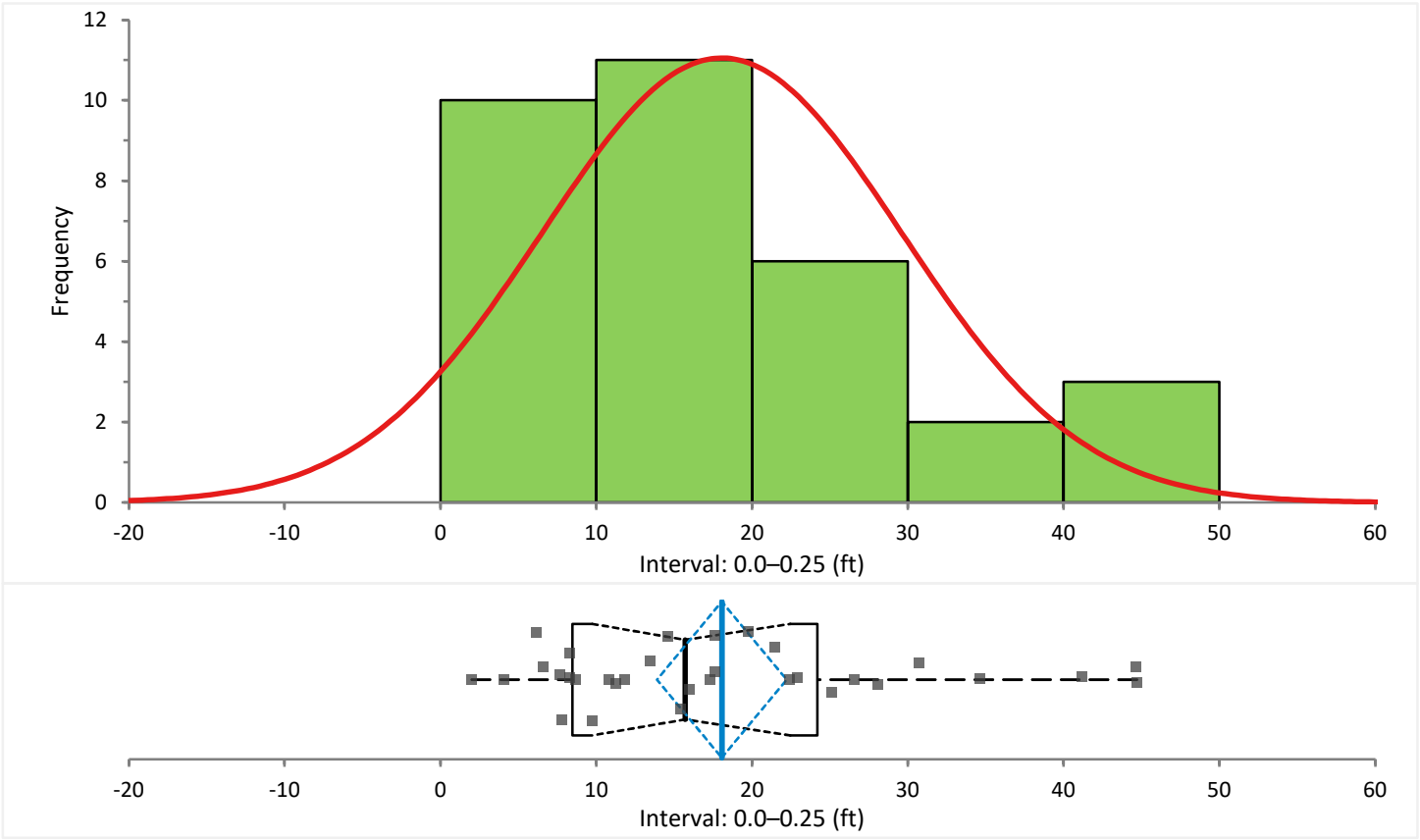
Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:20 by Kurt Frantzen

Descriptives



N	32

Distribution: Interval: 0.0–0.25

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:20 by Kurt Frantzen

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
Interval: 0.0–0.25 (ft)	18.05	13.89 22.22	2.04	11.55	0.9	0.24

	Minimum	1st quartile	Median	97.99% CI	3rd quartile	Maximum
Interval: 0.0–0.25 (ft)	2.00	8.47	15.70	9.75 22.45	24.20	44.7

	Mode
Interval: 0.0–0.25 (ft)	8.30

Quantile	Interval: 0.0–0.25 (ft)
0.100	6.43
0.200	8.20
0.300	9.79
0.400	12.29
0.500	15.70
0.600	17.64
0.700	22.42
0.800	26.87
0.900	37.48

Distribution: Interval: 0.0–0.25

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:20 by Kurt Frantzen

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <10	10	0.313	0.0313	10	0.313
≥10 to <20	11	0.344	0.0344	21	0.656
≥20 to <30	6	0.188	0.0188	27	0.844
≥30 to <40	2	0.063	0.0063	29	0.906
≥40 to ≤50	3	0.094	0.0094	32	1.000

Distribution: 0.25–0.5

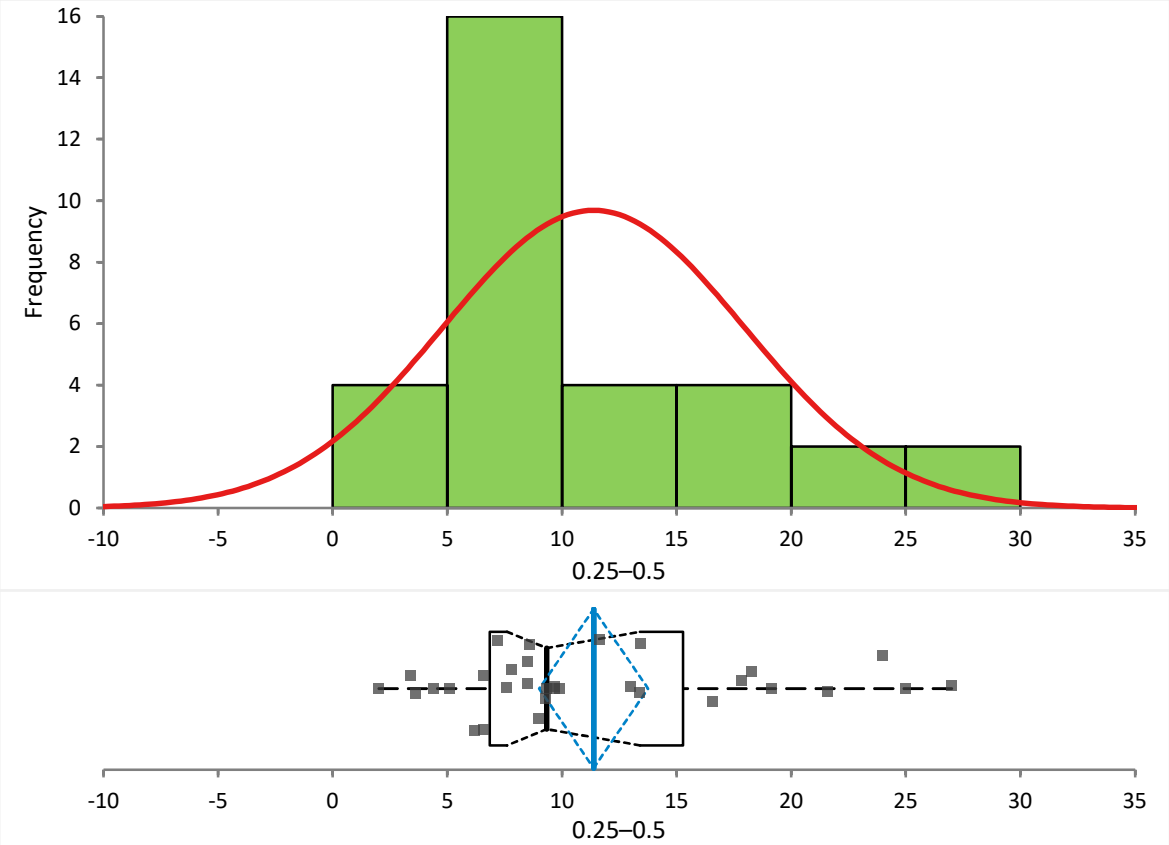
Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:21 by Kurt Frantzen

Descriptives



	N
	32

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
0.25–0.5	11.38	9.00 to 13.75	1.165	6.59	0.9	0.03

Distribution: 0.25–0.5

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:21 by Kurt Frantzen

	Minimum	1st quartile	Median	97.99% CI	3rd quartile	Maximum
0.25–0.5	2.0	6.85	9.33	7.60 to 13.40	15.29	27.0

	Mode
0.25–0.5	9.7

Quantile	0.25–0.5
0.100	4.05
0.200	6.52
0.300	7.61
0.400	8.53
0.500	9.33
0.600	9.85
0.700	13.39
0.800	17.94
0.900	22.64

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	4	0.125	0.0250	4	0.125
≥5 to <10	16	0.500	0.1000	20	0.625
≥10 to <15	4	0.125	0.0250	24	0.750
≥15 to <20	4	0.125	0.0250	28	0.875
≥20 to <25	2	0.063	0.0125	30	0.938
≥25 to ≤30	2	0.063	0.0125	32	1.000

Distribution: 0.5–1.0

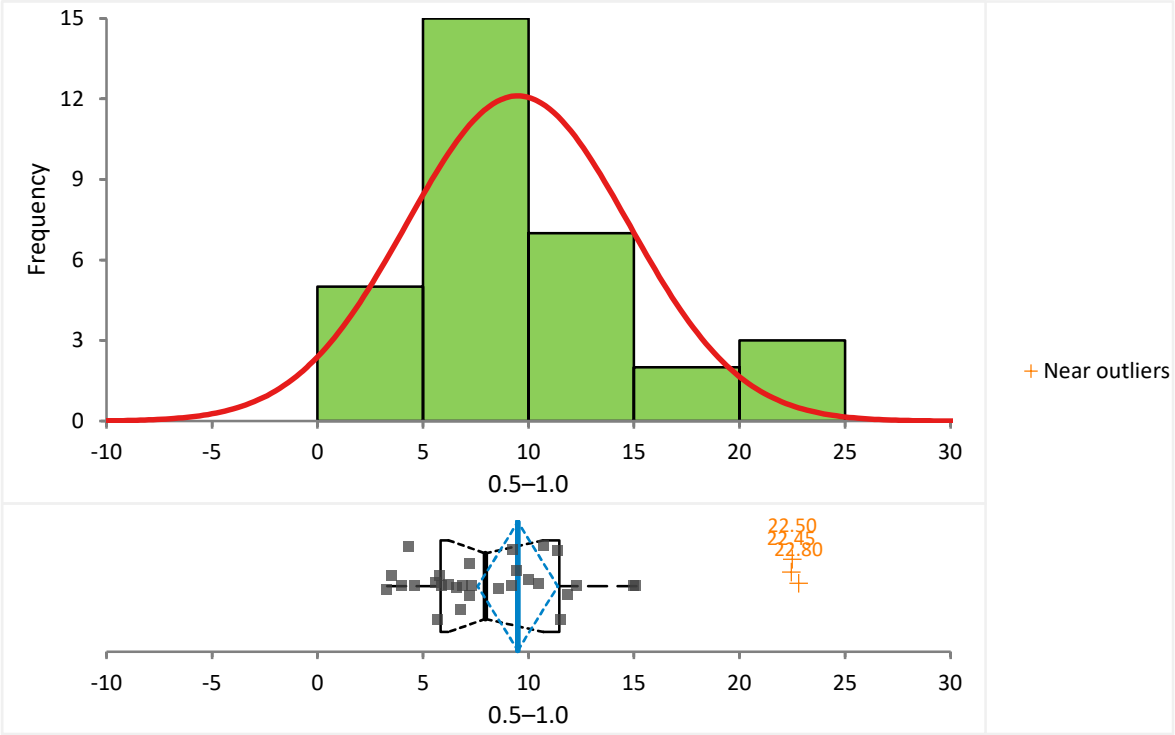
Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:22 by Kurt Frantzen

Descriptives



	N	32

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
0.5–1.0	9.484	7.585 to 11.384	0.9314	5.269	1.4	1.59

Distribution: 0.5–1.0

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:22 by Kurt Frantzen

	Minimum	1st quartile	Median	97.99% CI	3rd quartile	Maximum
0.5–1.0	3.30	5.842	7.950	6.200 to 10.700	11.458	22.80

	Mode
0.5–1.0	7.20

Quantile	0.5–1.0
0.100	4.170
0.200	5.680
0.300	6.213
0.400	6.980
0.500	7.950
0.600	9.397
0.700	10.693
0.800	11.940
0.900	18.285

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	5	0.156	0.0313	5	0.156
≥5 to <10	15	0.469	0.0938	20	0.625
≥10 to <15	7	0.219	0.0438	27	0.844
≥15 to <20	2	0.063	0.0125	29	0.906
≥20 to ≤25	3	0.094	0.0188	32	1.000

Distribution: Interval: 0.5–1.0

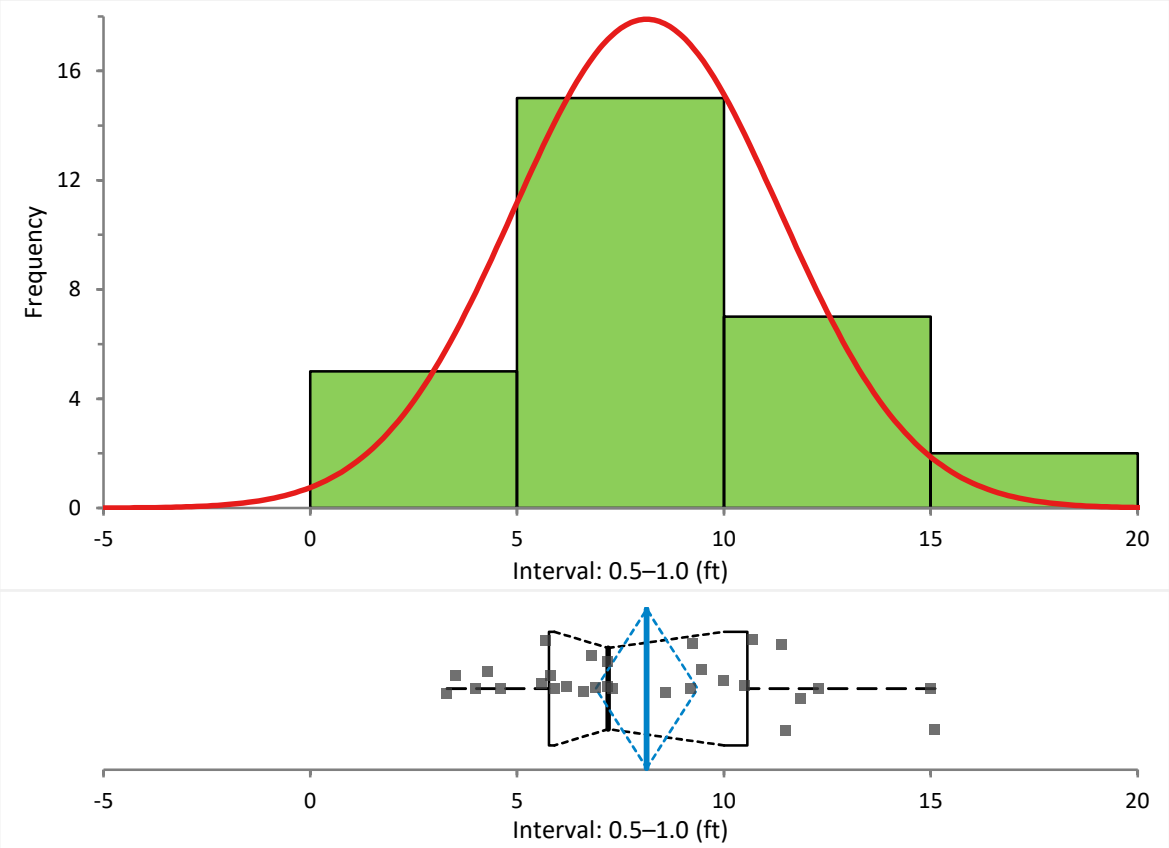
Analyse-it v5.50

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:52 by Kurt Frantzen

Descriptives



	N	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
Interval: 0.5–1.0 (ft)	29	8.129	6.900 to 9.359	0.6002	3.232	0.5	-0.41

Distribution: Interval: 0.5–1.0

Analyse-it v5.50

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:52 by Kurt Frantzen

	Minimum	1st quartile	Median	97.59% CI	3rd quartile	Maximum
Interval: 0.5–1.0 (ft)	3.30	5.767	7.200	5.900 to 10.000	10.567	15.10

	Mode
Interval: 0.5–1.0 (ft)	7.20

Quantile	Interval: 0.5–1.0 (ft)
0.100	4.080
0.200	5.620
0.300	5.940
0.400	6.807
0.500	7.200
0.600	9.160
0.700	9.927
0.800	11.260
0.900	12.180

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	5	0.172	0.0345	5	0.172
≥5 to <10	15	0.517	0.1034	20	0.690
≥10 to <15	7	0.241	0.0483	27	0.931
≥15 to ≤20	2	0.069	0.0138	29	1.000

Distribution: 1.0–2.0

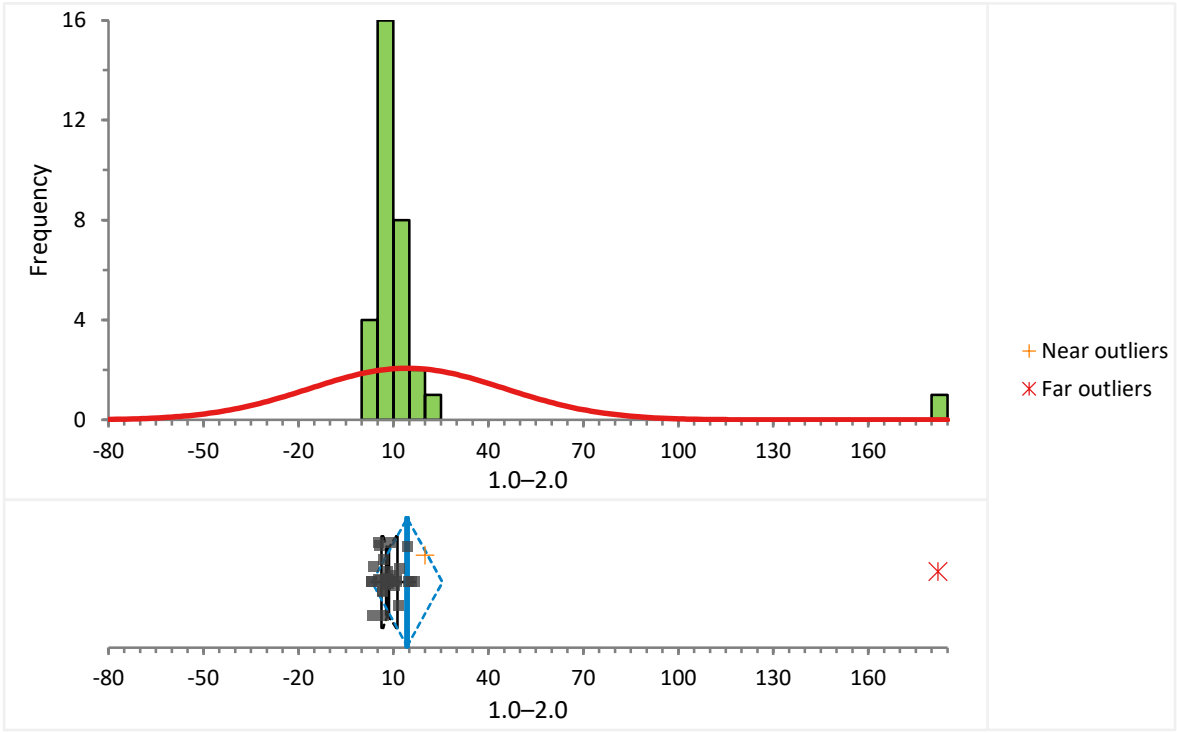
Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:22 by Kurt Frantzen

Descriptives



	N	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
1.0–2.0	32	14.311	3.181 to 25.441	5.4574	30.871	5.5	30.78

Distribution: 1.0–2.0

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:22 by Kurt Frantzen

	Minimum	1st quartile	Median	97.99% CI	3rd quartile	Maximum
1.0–2.0	3.10	6.267	8.150	6.700 to 10.850	11.317	182.00

	Mode
1.0–2.0	7.40

Quantile	1.0–2.0
0.100	3.770
0.200	5.460
0.300	6.707
0.400	7.400
0.500	8.150
0.600	9.273
0.700	10.832
0.800	12.470
0.900	16.155

Distribution: 1.0–2.0

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:22 by Kurt Frantzen

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	4	0.125	0.0250	4	0.125
≥5 to <10	16	0.500	0.1000	20	0.625
≥10 to <15	8	0.250	0.0500	28	0.875
≥15 to <20	2	0.063	0.0125	30	0.938
≥20 to <25	1	0.031	0.0063	31	0.969
≥25 to <30	0	0.000	0.0000	31	0.969
≥30 to <35	0	0.000	0.0000	31	0.969
≥35 to <40	0	0.000	0.0000	31	0.969
≥40 to <45	0	0.000	0.0000	31	0.969
≥45 to <50	0	0.000	0.0000	31	0.969
≥50 to <55	0	0.000	0.0000	31	0.969
≥55 to <60	0	0.000	0.0000	31	0.969
≥60 to <65	0	0.000	0.0000	31	0.969
≥65 to <70	0	0.000	0.0000	31	0.969
≥70 to <75	0	0.000	0.0000	31	0.969
≥75 to <80	0	0.000	0.0000	31	0.969
≥80 to <85	0	0.000	0.0000	31	0.969
≥85 to <90	0	0.000	0.0000	31	0.969
≥90 to <95	0	0.000	0.0000	31	0.969
≥95 to <100	0	0.000	0.0000	31	0.969
≥100 to <105	0	0.000	0.0000	31	0.969
≥105 to <110	0	0.000	0.0000	31	0.969
≥110 to <115	0	0.000	0.0000	31	0.969
≥115 to <120	0	0.000	0.0000	31	0.969
≥120 to <125	0	0.000	0.0000	31	0.969
≥125 to <130	0	0.000	0.0000	31	0.969
≥130 to <135	0	0.000	0.0000	31	0.969
≥135 to <140	0	0.000	0.0000	31	0.969
≥140 to <145	0	0.000	0.0000	31	0.969
≥145 to <150	0	0.000	0.0000	31	0.969
≥150 to <155	0	0.000	0.0000	31	0.969
≥155 to <160	0	0.000	0.0000	31	0.969
≥160 to <165	0	0.000	0.0000	31	0.969
≥165 to <170	0	0.000	0.0000	31	0.969
≥170 to <175	0	0.000	0.0000	31	0.969
≥175 to <180	0	0.000	0.0000	31	0.969
≥180 to ≤185	1	0.031	0.0063	32	1.000

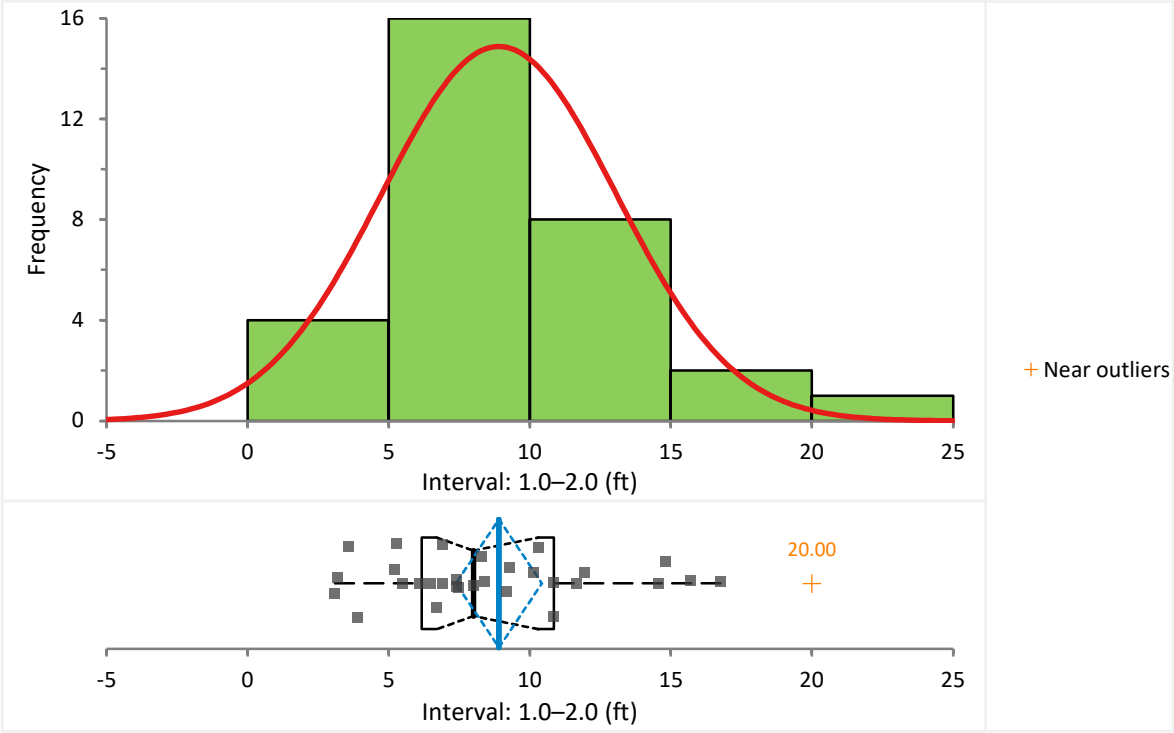
Distribution: Interval: 1.0–2.0

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:50 by Kurt Frantzen

Descriptives



N	31

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
Interval: 1.0–2.0 (ft)	8.902	7.378 to 10.425	0.7462	4.155	0.9	0.47

Distribution: Interval: 1.0–2.0

Analyse-it v5.50

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:50 by Kurt Frantzen

	Minimum	1st quartile	Median	97.06% CI	3rd quartile	Maximum
Interval: 1.0–2.0 (ft)	3.10	6.167	8.000	6.700 to 10.300	10.850	20.00

	Mode
Interval: 1.0–2.0 (ft)	7.40

Quantile	Interval: 1.0–2.0 (ft)
0.100	3.740
0.200	5.420
0.300	6.647
0.400	7.333
0.500	8.000
0.600	9.213
0.700	10.447
0.800	11.770
0.900	15.280

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	4	0.129	0.0258	4	0.129
≥5 to <10	16	0.516	0.1032	20	0.645
≥10 to <15	8	0.258	0.0516	28	0.903
≥15 to <20	2	0.065	0.0129	30	0.968
≥20 to ≤25	1	0.032	0.0065	31	1.000

Distribution: 2.0–3.0

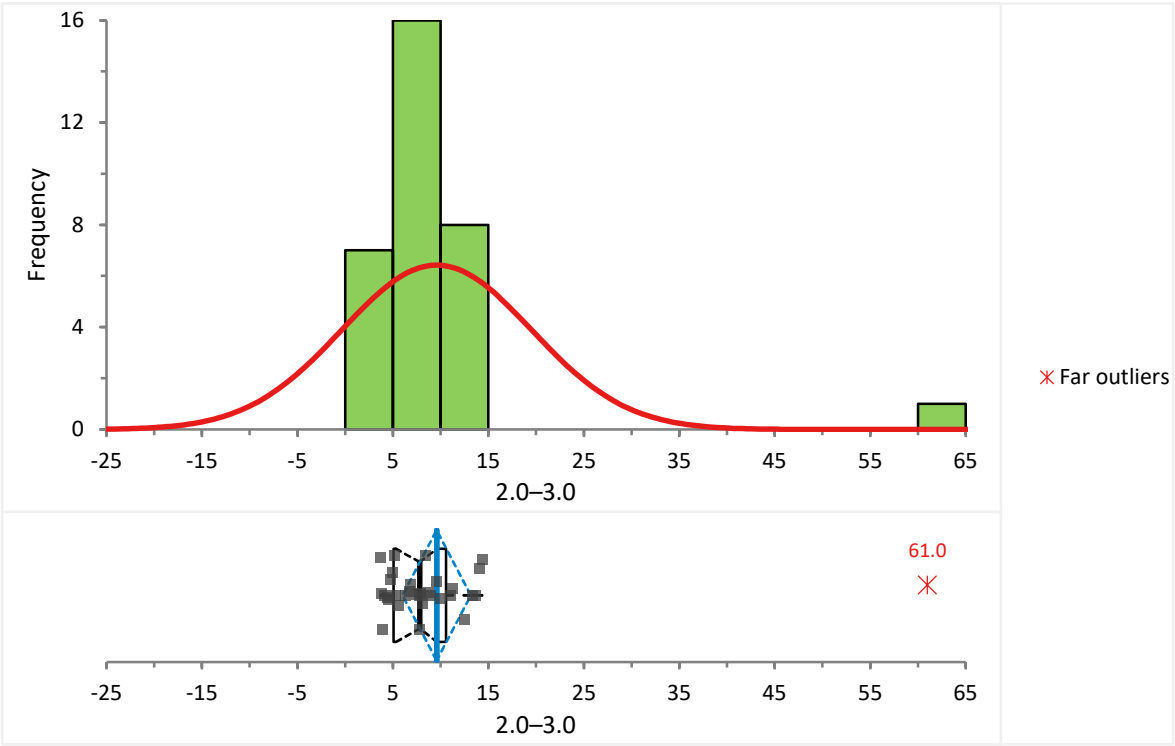
Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:24 by Kurt Frantzen

Descriptives



	N
2.0–3.0	32

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
2.0–3.0	9.57	5.99 to 13.15	1.755	9.93	4.7	24.93

Distribution: 2.0–3.0

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:24 by Kurt Frantzen

	Minimum	1st quartile	Median	97.99% CI	3rd quartile	Maximum
2.0–3.0	3.7	5.08	7.80	5.30 to 9.60	10.58	61.0

	Mode
2.0–3.0	7.8

Quantile	2.0–3.0
0.100	4.01
0.200	4.76
0.300	5.31
0.400	6.73
0.500	7.80
0.600	8.32
0.700	9.58
0.800	11.50
0.900	13.85

Distribution: 2.0–3.0

Analyse-it v5.50

Raw XRF Database M1:R34

Filter: No filter

Last updated 25 March 2020 at 13:24 by Kurt Frantzen

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	7	0.219	0.0438	7	0.219
≥5 to <10	16	0.500	0.1000	23	0.719
≥10 to <15	8	0.250	0.0500	31	0.969
≥15 to <20	0	0.000	0.0000	31	0.969
≥20 to <25	0	0.000	0.0000	31	0.969
≥25 to <30	0	0.000	0.0000	31	0.969
≥30 to <35	0	0.000	0.0000	31	0.969
≥35 to <40	0	0.000	0.0000	31	0.969
≥40 to <45	0	0.000	0.0000	31	0.969
≥45 to <50	0	0.000	0.0000	31	0.969
≥50 to <55	0	0.000	0.0000	31	0.969
≥55 to <60	0	0.000	0.0000	31	0.969
≥60 to ≤65	1	0.031	0.0063	32	1.000

Distribution: Interval: 2.0–3.0

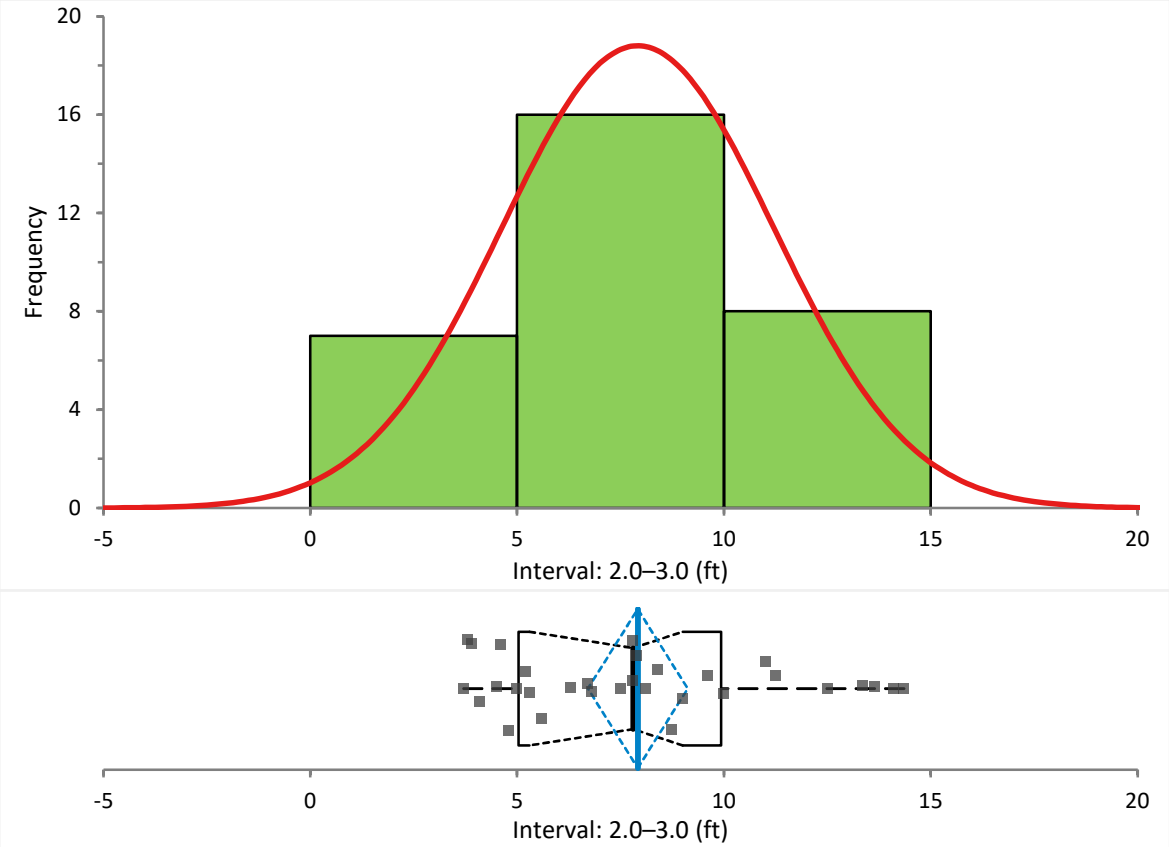
Analyse-it v5.50

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:56 by Kurt Frantzen

Descriptives



	N
	31

	Mean	95% CI	Mean SE	SD	Skewness	Kurtosis
Interval: 2.0–3.0 (ft)	7.91	6.71 to 9.12	0.591	3.29	0.6	-0.73

Distribution: Interval: 2.0–3.0

Analyse-it v5.50

Trimmed XRF dBase A1:F34

Filter: No filter

Last updated 26 March 2020 at 9:56 by Kurt Frantzen

	Minimum	1st quartile	Median	97.06% CI	3rd quartile	Maximum
Interval: 2.0–3.0 (ft)	3.7	5.03	7.80	5.30 to 9.00	9.93	14.4

	Mode
Interval: 2.0–3.0 (ft)	7.8

Quantile	Interval: 2.0–3.0 (ft)
0.100	3.99
0.200	4.72
0.300	5.27
0.400	6.65
0.500	7.80
0.600	8.14
0.700	9.16
0.800	11.10
0.900	13.51

Frequency Distribution

Class	Frequency	Relative frequency	Density	Cumulative frequency	Cumulative relative frequency
≥0 to <5	7	0.226	0.0452	7	0.226
≥5 to <10	16	0.516	0.1032	23	0.742
≥10 to ≤15	8	0.258	0.0516	31	1.000

ATTACHMENT C

Significant Environmental Hazard Abatement Documentation

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 10, 2020

FOR: Attn: Ms. Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		02/27/20	
Location Code:	THUNDER	Received by:	B	04/08/20	14:52
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	2019-096				

Laboratory Data

SDG ID: GCF70433
Phoenix ID: CF70434

Project ID: 2019-096 WESTPORT
Client ID: TB-2 (1-2`)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	182	7.0	mg/Kg	10	04/10/20	TH	SW6010D
Percent Solid	92		%		04/08/20	VT	SW846-%Solid
Total Metals Digest	Completed				04/08/20	F/AG	SW3050B

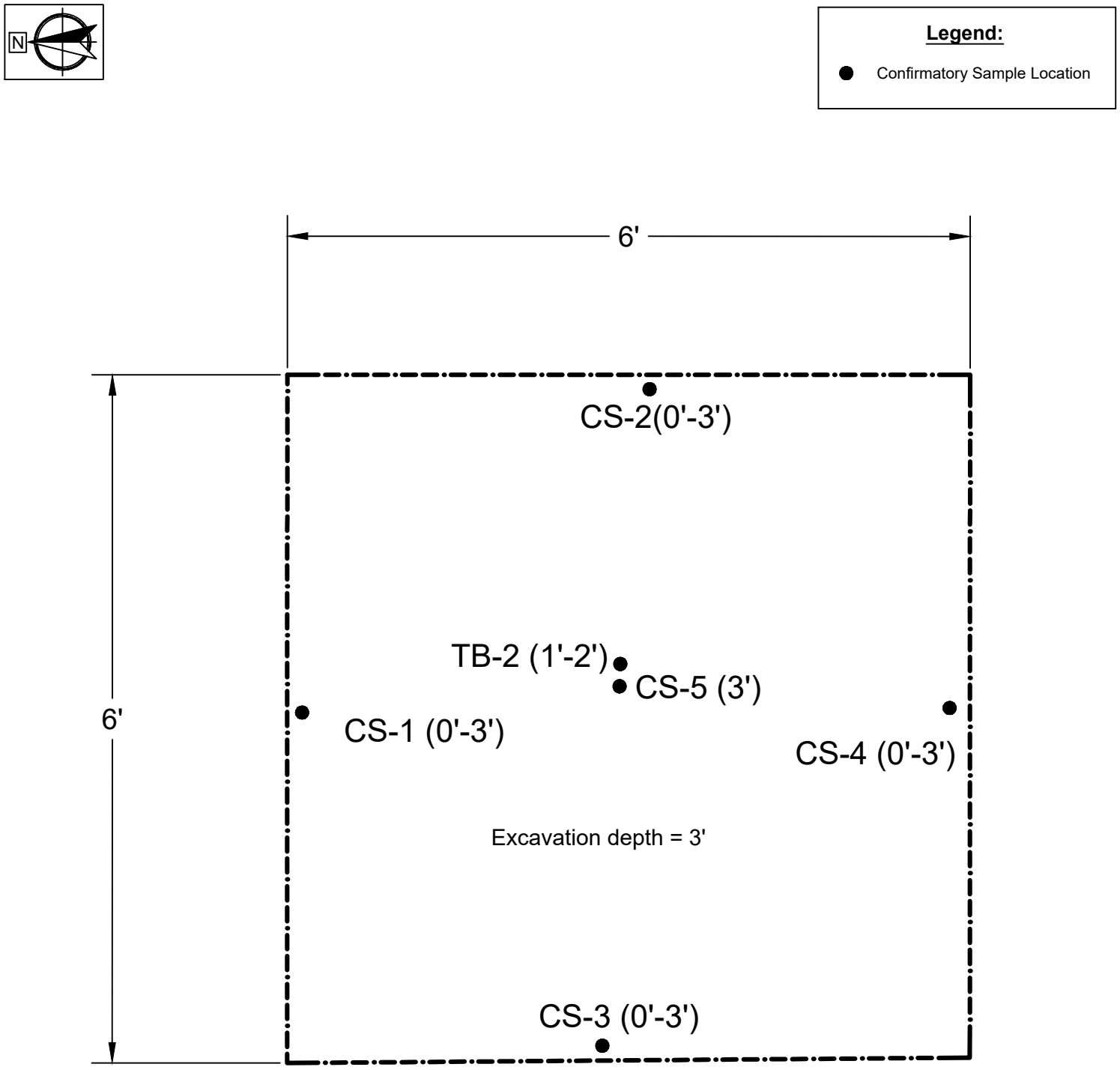
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
April 10, 2020
Reviewed and Released by: Greg Lawrence, Assistant Lab Director



THUNDERBIRD ENVIRONMENTAL

14 Leffingwell Road
Clinton, Connecticut 06413
ph: (860) 227-4714
web: tbirdenv.com

SEH Excavation Limits

Site Location:

Baron's South Property
62 Compo Road South
Westport, CT 06880

Project Number:

2020_096

Attachment C

PHOENIX
Environmental Laboratories, Inc.

Thursday, May 28, 2020

Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Project ID: 2019-096
SDG ID: GCF99424
Sample ID#s: CF99424 - CF99428

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

May 28, 2020

SDG I.D.: GCF99424

Project ID: 2019-096

Client Id	Lab Id	Matrix
CS-1	CF99424	SOIL
CS-2	CF99425	SOIL
CS-3	CF99426	SOIL
CS-4	CF99427	SOIL
CS-5	CF99428	SOIL

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	8:25
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99424
Phoenix ID: CF99424

Project ID: 2019-096
Client ID: CS-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	37.7	0.78	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	86		%		05/21/20	HB	SW846-%Solid
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	8:30
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99424
Phoenix ID: CF99425

Project ID: 2019-096
Client ID: CS-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	15.8	0.76	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	88		%		05/21/20	HB	SW846-%Solid
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	8:36
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99424
Phoenix ID: CF99426

Project ID: 2019-096
Client ID: CS-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	37.6	0.72	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	87		%		05/21/20	HB	SW846-%Solid
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	8:48
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99424
Phoenix ID: CF99427

Project ID: 2019-096
Client ID: CS-4

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	14.2	0.75	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	89		%		05/21/20	HB	SW846-%Solid
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	8:56
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99424
Phoenix ID: CF99428

Project ID: 2019-096
Client ID: CS-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Arsenic	17.9	0.71	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	87		%		05/21/20	HB	SW846-%Solid
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 28, 2020

QA/QC Data

SDG I.D.: GCF99424

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 530896 (mg/kg), QC Sample No: CF99424 (CF99424, CF99425, CF99426, CF99427, CF99428)													
ICP Metals - Soil													
Arsenic	BRL	0.67	37.7	37.4	0.80	124	119	4.1	110			75 - 125	35

Comment:

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
May 28, 2020

Thursday, May 28, 2020

Criteria: CT: GAM, I/C, RC

State: CT

Sample Criteria Exceedances Report

GCF99424 - THUNDER

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CF99424	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	37.7	0.78	10	10	mg/Kg
CF99424	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	37.7	0.78	10	10	mg/Kg
CF99425	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	15.8	0.76	10	10	mg/Kg
CF99425	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	15.8	0.76	10	10	mg/Kg
CF99426	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	37.6	0.72	10	10	mg/Kg
CF99426	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	37.6	0.72	10	10	mg/Kg
CF99427	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	14.2	0.75	10	10	mg/Kg
CF99427	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	14.2	0.75	10	10	mg/Kg
CF99428	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	17.9	0.71	10	10	mg/Kg
CF99428	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	17.9	0.71	10	10	mg/Kg

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Thunderbird Environmental

Project Location: 2019-096 ***Project Number:***

Laboratory Sample ID(s): CF99424-CF99428 ***Sampling Date(s):*** 5/20/2020

List RCP Methods Used (e.g., 8260, 8270, et cetera) 6010

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☑ Yes ☐ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?**	☑ Yes ☐ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☑ Yes ☐ No ☑ Yes ☐ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☐ Yes ☑ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☑ Yes ☐ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature: Rashmi Makol **Position:** Project Manager

Printed Name: Rashmi Makol **Date:** Thursday, May 28, 2020

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

May 28, 2020

SDG I.D.: GCF99424

SDG Comments

Metals Analysis:
The client requested a shorter list of elements than the 6010 RCP list. Only Arsenic is reported as requested on the chain of custody.

ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ARCOS-2 05/26/20 07:56 Cindy Pearce, Chemist 05/26/20

CF99424, CF99425, CF99426, CF99427, CF99428

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

QC (Site Specific):

Batch 530896 (CF99424)

CF99424, CF99425, CF99426, CF99427, CF99428

All LCS recoveries were within 75 - 125 with the following exceptions: None.
All LCSD recoveries were within 75 - 125 with the following exceptions: None.
All LCS/LCSD RPDs were less than 35% with the following exceptions: None.
All MS recoveries were within 75 - 125 with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

Temperature Narration

The samples were received at 2.8C with cooling initiated.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

Cooler: Yes [X] No [ ]
Coolant: IPK [ ] ICE [X] No [ ]
Temp 2.8 °C Pg 1 of 1

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery/Contact Options:
[ ] Fax:
[ ] Phone:
[X] Email: Lauren@thirdenv.com

Customer: Thunderbird Environmental
Address: 14 Leffingwell RD.
Clinton, CT 06413

Project: 2019-096
Report to: Lauren Lunat
Invoice to: Dawn Hittle
QUOTE #

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 5/20/20

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Total Arsenic	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container (4) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
99424	CS-1	S	5/20/20	825	X			1									
99425	CS-2	S	5/20/20	830	X			1									
99426	CS-3	S	5/20/20	836	X			1									
99427	CS-4	S	5/20/20	848	X			1									
99428	CS-5	S	5/20/20	856	X			1									
																	5

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	5-21-20	1221
[signature]	[signature]	5/21/20	16:16

Comments, Special Requirements or Regulations:

Turnaround Time:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] (Residential) Direct Exposure
[ ] (Comm/Industrial) Direct Exposure
[ ] GA Leachability
[ ] GB Leachability
[ ] GA-GW Objectives
[ ] GB-GW Objectives

CT
[X] RCP Cert
[ ] GW Protection
[ ] SW Protection
[X] GA Mobility
[ ] GB Mobility
[X] Residential DEC
[X] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1 [ ] MWRA eSMART
[ ] GW-2
[ ] GW-3
[ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
[ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
[ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
[ ] SW Protection

State where samples were collected: CT

Data Format
[X] Excel
[X] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[X] Phoenix Std Report
[ ] Other
* SURCHARGE APPLIES

PHOENIX
Environmental Laboratories, Inc.

Thursday, May 28, 2020

Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Project ID: 2019-096
SDG ID: GCF99429
Sample ID#s: CF99429

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

May 28, 2020

SDG I.D.: GCF99429

Project ID: 2019-096

Client Id	Lab Id	Matrix
WC-1	CF99429	SOIL

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 28, 2020

FOR: Attn: Lauren Lomax
Thunderbird Environmental
14 Leffingwell Rd
Clinton, CT 06413

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		05/20/20	10:15
Location Code:	THUNDER	Received by:	SW	05/21/20	16:16
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCF99429
Phoenix ID: CF99429

Project ID: 2019-096
Client ID: WC-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	1	05/26/20	CPP	SW6010D
Arsenic	21.0	0.78	mg/Kg	1	05/26/20	CPP	SW6010D
Barium	105	0.39	mg/Kg	1	05/26/20	CPP	SW6010D
Cadmium	1.21	0.39	mg/Kg	1	05/26/20	CPP	SW6010D
Chromium	33.9	0.39	mg/Kg	1	05/26/20	CPP	SW6010D
Mercury	0.05	0.03	mg/Kg	2	05/27/20	RS	SW7471B
Lead	32.6	0.39	mg/Kg	1	05/26/20	CPP	SW6010D
Selenium	< 1.6	1.6	mg/Kg	1	05/26/20	CPP	SW6010D
Percent Solid	88		%		05/21/20	HB	SW846-%Solid
Flash Point	>200	200	Degree F	1	05/22/20	BJA	1010/CH7/ASTMD92
Ignitability	Passed	140	degree F	1	05/22/20	BJA	SW846-Ignit
Soil Extraction for PCB	Completed				05/22/20	KK/LL	SW3545A
Soil Extraction for Pesticide	Completed				05/22/20	KK/LL	SW3545A
Mercury Digestion	Completed				05/26/20	VT/Q/VT	SW7471B
Extraction of CT ETPH	Completed				05/21/20	GG/ML	SW3546
Soil Extraction for SVOA	Completed				05/21/20	RR/ML	SW3546
Paint Filter Test	Passed		PASS/FAIL		05/21/20	K	SW9095B
Total Metals Digest	Completed				05/22/20	TH/AG/BF	SW3050B
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	55	mg/Kg	1	05/22/20	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	05/22/20	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	90		%	1	05/22/20	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1221	ND	380	ug/Kg	10	05/24/20	SC	SW8082A

Ver 1

Project ID: 2019-096
Client ID: WC-1

Phoenix I.D.: CF99429

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1242	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1248	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1254	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1260	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1262	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
PCB-1268	ND	380	ug/Kg	10	05/24/20	SC	SW8082A
QA/QC Surrogates							
% DCBP	69		%	10	05/24/20	SC	30 - 150 %
% DCBP (Confirmation)	79		%	10	05/24/20	SC	30 - 150 %
% TCMX	69		%	10	05/24/20	SC	30 - 150 %
% TCMX (Confirmation)	72		%	10	05/24/20	SC	30 - 150 %
Pesticides							
4,4' -DDD	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
4,4' -DDE	15	7.5	ug/Kg	2	05/26/20	CG	SW8081B
4,4' -DDT	11	7.5	ug/Kg	2	05/26/20	CG	SW8081B
a-BHC	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
Alachlor	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Aldrin	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
b-BHC	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
Chlordane	ND	38	ug/Kg	2	05/26/20	CG	SW8081B
d-BHC	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
Dieldrin	ND	3.8	ug/Kg	2	05/26/20	CG	SW8081B
Endosulfan I	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Endosulfan II	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Endosulfan sulfate	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Endrin	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Endrin aldehyde	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Endrin ketone	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
g-BHC	ND	1.5	ug/Kg	2	05/26/20	CG	SW8081B
Heptachlor	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Heptachlor epoxide	ND	7.5	ug/Kg	2	05/26/20	CG	SW8081B
Methoxychlor	ND	38	ug/Kg	2	05/26/20	CG	SW8081B
Toxaphene	ND	150	ug/Kg	2	05/26/20	CG	SW8081B
QA/QC Surrogates							
% DCBP	77		%	2	05/26/20	CG	30 - 150 %
% DCBP (Confirmation)	64		%	2	05/26/20	CG	30 - 150 %
% TCMX	53		%	2	05/26/20	CG	30 - 150 %
% TCMX (Confirmation)	54		%	2	05/26/20	CG	30 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,1,1-Trichloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	2.4	ug/Kg	1	05/22/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,1-Dichloropropene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C

Project ID: 2019-096
Client ID: WC-1

Phoenix I.D.: CF99429

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,2,3-Trichloropropane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,3-Dichloropropane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
2,2-Dichloropropane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
2-Chlorotoluene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
2-Hexanone	ND	20	ug/Kg	1	05/22/20	JLI	SW8260C
2-Isopropyltoluene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
4-Chlorotoluene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	20	ug/Kg	1	05/22/20	JLI	SW8260C
Acetone	ND	200	ug/Kg	1	05/22/20	JLI	SW8260C
Acrylonitrile	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Benzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Bromobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Bromochloromethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Bromodichloromethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Bromoform	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Bromomethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Carbon Disulfide	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Carbon tetrachloride	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Chlorobenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Chloroethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Chloroform	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Chloromethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
cis-1,2-Dichloroethene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
cis-1,3-Dichloropropene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Dibromochloromethane	ND	2.4	ug/Kg	1	05/22/20	JLI	SW8260C
Dibromomethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Dichlorodifluoromethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Ethylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Hexachlorobutadiene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Isopropylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
m&p-Xylene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Methyl Ethyl Ketone	ND	24	ug/Kg	1	05/22/20	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	8.1	ug/Kg	1	05/22/20	JLI	SW8260C
Methylene chloride	ND	8.1	ug/Kg	1	05/22/20	JLI	SW8260C
Naphthalene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
n-Butylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
n-Propylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
o-Xylene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
p-Isopropyltoluene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C

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Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
sec-Butylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Styrene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
tert-Butylbenzene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Tetrachloroethene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Tetrahydrofuran (THF)	ND	8.1	ug/Kg	1	05/22/20	JLI	SW8260C
Toluene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Total Xylenes	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
trans-1,2-Dichloroethene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
trans-1,3-Dichloropropene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	8.1	ug/Kg	1	05/22/20	JLI	SW8260C
Trichloroethene	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Trichlorofluoromethane	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
Trichlorotrifluoroethane	ND	8.1	ug/Kg	1	05/22/20	JLI	SW8260C
Vinyl chloride	ND	4.0	ug/Kg	1	05/22/20	JLI	SW8260C
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	99		%	1	05/22/20	JLI	70 - 130 %
% Bromofluorobenzene	100		%	1	05/22/20	JLI	70 - 130 %
% Dibromofluoromethane	100		%	1	05/22/20	JLI	70 - 130 %
% Toluene-d8	101		%	1	05/22/20	JLI	70 - 130 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	05/22/20	AW	SW8270D
1,2,4-Trichlorobenzene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
1,2-Dichlorobenzene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
1,3-Dichlorobenzene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
1,4-Dichlorobenzene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2,4,5-Trichlorophenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
2,4-Dichlorophenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2,4-Dimethylphenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	05/22/20	AW	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
2-Chloronaphthalene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2-Chlorophenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2-Methylnaphthalene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2-Methylphenol (o-cresol)	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	05/22/20	AW	SW8270D
2-Nitrophenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	370	ug/Kg	1	05/22/20	AW	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	05/22/20	AW	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	05/22/20	AW	SW8270D
4-Bromophenyl phenyl ether	ND	370	ug/Kg	1	05/22/20	AW	SW8270D
4-Chloro-3-methylphenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
4-Chlorophenyl phenyl ether	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	05/22/20	AW	SW8270D
4-Nitrophenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D

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Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acenaphthene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Acenaphthylene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Acetophenone	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Aniline	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Anthracene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benz(a)anthracene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benzidine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Benzo(a)pyrene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benzo(b)fluoranthene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benzo(ghi)perylene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benzo(k)fluoranthene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Benzoic acid	ND	740	ug/Kg	1	05/22/20	AW	SW8270D
Benzyl butyl phthalate	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Bis(2-chloroethoxy)methane	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Bis(2-chloroethyl)ether	ND	370	ug/Kg	1	05/22/20	AW	SW8270D
Bis(2-chloroisopropyl)ether	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Bis(2-ethylhexyl)phthalate	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Carbazole	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Chrysene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Dibenz(a,h)anthracene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Diethyl phthalate	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Dimethylphthalate	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Di-n-butylphthalate	ND	370	ug/Kg	1	05/22/20	AW	SW8270D
Di-n-octylphthalate	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Fluoranthene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Fluorene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Hexachlorobenzene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Hexachlorocyclopentadiene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Hexachloroethane	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Indeno(1,2,3-cd)pyrene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Isophorone	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Naphthalene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	05/22/20	AW	SW8270D
Pentachlorophenol	ND	370	ug/Kg	1	05/22/20	AW	SW8270D
Phenanthrene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Phenol	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Pyrene	ND	260	ug/Kg	1	05/22/20	AW	SW8270D
Pyridine	ND	200	ug/Kg	1	05/22/20	AW	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	83		%	1	05/22/20	AW	30 - 130 %
% 2-Fluorobiphenyl	62		%	1	05/22/20	AW	30 - 130 %
% 2-Fluorophenol	54		%	1	05/22/20	AW	30 - 130 %
% Nitrobenzene-d5	61		%	1	05/22/20	AW	30 - 130 %

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Phoenix I.D.: CF99429

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Phenol-d5	62		%	1	05/22/20	AW	30 - 130 %
% Terphenyl-d14	84		%	1	05/22/20	AW	30 - 130 %
Field Extraction	Completed				05/20/20		SW5035A

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

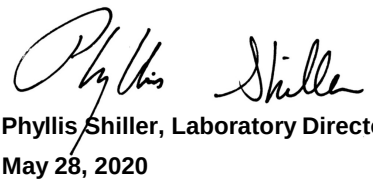
Comments:

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
May 28, 2020
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 28, 2020

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 531068 (mg/kg), QC Sample No: CF99298 2X (CF99429)														
Mercury - Soil	BRL	0.03	<0.03	<0.03	NC	115	104	10.0	87.4	91.8	4.9	70 - 130	30	
Comment:														
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.														
QA/QC Batch 530896 (mg/kg), QC Sample No: CF99424 (CF99429)														
ICP Metals - Soil														
Arsenic	BRL	0.67	37.7	37.4	0.80	124	119	4.1	110			75 - 125	35	
Barium	BRL	0.33	110	97.8	11.7	119	125	4.9	128			75 - 125	35	m
Cadmium	BRL	0.33	1.13	1.13	NC	116	109	6.2	107			75 - 125	35	
Chromium	BRL	0.33	33.6	32.7	2.70	121	115	5.1	112			75 - 125	35	
Lead	BRL	0.33	30.5	27.3	11.1	118	115	2.6	112			75 - 125	35	
Selenium	BRL	1.3	<1.6	<1.6	NC	124	120	3.3	110			75 - 125	35	
Silver	BRL	0.33	<0.39	<0.39	NC	119	116	2.6	110			75 - 125	35	
Comment:														
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.														

m = This parameter is outside laboratory MS/MSD specified recovery limits.

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QA/QC Report

May 28, 2020

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 530899 (Degree F), QC Sample No: CF98818 (CF99429)													
Flash Point			>200	>200	NC	101						75 - 125	30
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

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QA/QC Report

May 28, 2020

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 530717 (mg/Kg), QC Sample No: CF99217 (CF99429)										
TPH by GC (Extractable Products) - Soil										
Ext. Petroleum H.C. (C9-C36)	ND	50	99	113	13.2	95	113	17.3	60 - 120	30
% n-Pentacosane	86	%	90	100	10.5	82	93	12.6	50 - 150	30
Comment:										
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.										
QA/QC Batch 530883 (ug/Kg), QC Sample No: CG00291 2X (CF99429)										
Polychlorinated Biphenyls - Soil										
PCB-1016	ND	33	82	76	7.6	57	65	13.1	40 - 140	30
PCB-1221	ND	33							40 - 140	30
PCB-1232	ND	33							40 - 140	30
PCB-1242	ND	33							40 - 140	30
PCB-1248	ND	33							40 - 140	30
PCB-1254	ND	33							40 - 140	30
PCB-1260	ND	33	89	85	4.6	62	74	17.6	40 - 140	30
PCB-1262	ND	33							40 - 140	30
PCB-1268	ND	33							40 - 140	30
% DCBP (Surrogate Rec)	87	%	104	100	3.9	72	83	14.2	30 - 150	30
% DCBP (Surrogate Rec) (Confirm	82	%	92	88	4.4	57	71	21.9	30 - 150	30
% TCMX (Surrogate Rec)	80	%	92	83	10.3	62	72	14.9	30 - 150	30
% TCMX (Surrogate Rec) (Confirm	76	%	88	79	10.8	59	67	12.7	30 - 150	30
QA/QC Batch 530884 (ug/Kg), QC Sample No: CG00291 2X (CF99429)										
Pesticides - Soil										
4,4' -DDD	ND	1.7	79	86	8.5	77			40 - 140	30
4,4' -DDE	ND	1.7	74	82	10.3	74			40 - 140	30
4,4' -DDT	ND	1.7	72	82	13.0	75			40 - 140	30
a-BHC	ND	1.0	63	69	9.1	58			40 - 140	30
Alachlor	ND	3.3	NA	NA	NC	NA			40 - 140	30
Aldrin	ND	1.0	66	73	10.1	64			40 - 140	30
b-BHC	ND	1.0	70	77	9.5	71			40 - 140	30
Chlordane	ND	33	69	76	9.7	67			40 - 140	30
d-BHC	ND	3.3	69	77	11.0	59			40 - 140	30
Dieldrin	ND	1.0	71	79	10.7	66			40 - 140	30
Endosulfan I	ND	3.3	73	80	9.2	39			40 - 140	30
Endosulfan II	ND	3.3	77	86	11.0	41			40 - 140	30
Endosulfan sulfate	ND	3.3	83	91	9.2	75			40 - 140	30
Endrin	ND	3.3	73	80	9.2	73			40 - 140	30
Endrin aldehyde	ND	3.3	72	76	5.4	59			40 - 140	30
Endrin ketone	ND	3.3	78	88	12.0	76			40 - 140	30
g-BHC	ND	1.0	67	73	8.6	61			40 - 140	30
Heptachlor	ND	3.3	67	73	8.6	54			40 - 140	30

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Heptachlor epoxide	ND	3.3	69	76	9.7	67			40 - 140	30	
Methoxychlor	ND	3.3	93	102	9.2	91			40 - 140	30	
Toxaphene	ND	130	NA	NA	NC	NA			40 - 140	30	
% DCBP	91	%	89	90	1.1	83			30 - 150	30	
% DCBP (Confirmation)	78	%	78	79	1.3	73			30 - 150	30	
% TCMX	63	%	63	62	1.6	59			30 - 150	30	
% TCMX (Confirmation)	67	%	66	65	1.5	59			30 - 150	30	

Comment:

This Batch consists of Blank, LCS, LCSD and MS.

QA/QC Batch 530775 (ug/kg), QC Sample No: CF99216 (CF99429)

Semivolatiles - Soil

1,2,4,5-Tetrachlorobenzene	ND	230	57	54	5.4	71			40 - 140	30	
1,2,4-Trichlorobenzene	ND	230	57	53	7.3	70			40 - 140	30	
1,2-Dichlorobenzene	ND	180	49	46	6.3	59			40 - 140	30	
1,2-Diphenylhydrazine	ND	230	65	61	6.3	71			40 - 140	30	
1,3-Dichlorobenzene	ND	230	47	43	8.9	56			40 - 140	30	
1,4-Dichlorobenzene	ND	230	47	43	8.9	55			40 - 140	30	
2,4,5-Trichlorophenol	ND	230	79	76	3.9	91			40 - 140	30	
2,4,6-Trichlorophenol	ND	130	78	75	3.9	91			30 - 130	30	
2,4-Dichlorophenol	ND	130	70	64	9.0	83			30 - 130	30	
2,4-Dimethylphenol	ND	230	74	67	9.9	85			30 - 130	30	
2,4-Dinitrophenol	ND	230	101	110	8.5	105			30 - 130	30	
2,4-Dinitrotoluene	ND	130	81	81	0.0	96			30 - 130	30	
2,6-Dinitrotoluene	ND	130	78	77	1.3	92			40 - 140	30	
2-Chloronaphthalene	ND	230	64	60	6.5	78			40 - 140	30	
2-Chlorophenol	ND	230	60	56	6.9	73			30 - 130	30	
2-Methylnaphthalene	ND	230	62	57	8.4	75			40 - 140	30	
2-Methylphenol (o-cresol)	ND	230	62	56	10.2	74			40 - 140	30	
2-Nitroaniline	ND	330	43	55	24.5	121			40 - 140	30	
2-Nitrophenol	ND	230	76	72	5.4	95			40 - 140	30	
3&4-Methylphenol (m&p-cresol)	ND	230	67	62	7.8	79			30 - 130	30	
3,3'-Dichlorobenzidine	ND	130	<10	<10	NC	74			40 - 140	30	I
3-Nitroaniline	ND	330	35	46	27.2	120			40 - 140	30	I
4,6-Dinitro-2-methylphenol	ND	230	90	95	5.4	97			30 - 130	30	
4-Bromophenyl phenyl ether	ND	230	73	70	4.2	81			40 - 140	30	
4-Chloro-3-methylphenol	ND	230	79	75	5.2	89			30 - 130	30	
4-Chloroaniline	ND	230	20	22	9.5	62			40 - 140	30	I
4-Chlorophenyl phenyl ether	ND	230	69	66	4.4	79			40 - 140	30	
4-Nitroaniline	ND	230	92	91	1.1	109			40 - 140	30	
4-Nitrophenol	ND	230	80	79	1.3	94			30 - 130	30	
Acenaphthene	ND	230	68	64	6.1	79			30 - 130	30	
Acenaphthylene	ND	130	69	65	6.0	80			40 - 140	30	
Acetophenone	ND	230	55	51	7.5	63			40 - 140	30	
Aniline	ND	330	43	43	0.0	55			40 - 140	30	
Anthracene	ND	230	73	71	2.8	80			40 - 140	30	
Benz(a)anthracene	ND	230	73	72	1.4	84			40 - 140	30	
Benzidine	ND	330	<10	<10	NC	36			40 - 140	30	I,m
Benzo(a)pyrene	ND	130	78	77	1.3	87			40 - 140	30	
Benzo(b)fluoranthene	ND	160	87	87	0.0	101			40 - 140	30	
Benzo(ghi)perylene	ND	230	65	59	9.7	73			40 - 140	30	
Benzo(k)fluoranthene	ND	230	58	59	1.7	66			40 - 140	30	
Benzoic Acid	ND	670	107	105	1.9	78			30 - 130	30	

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Benzyl butyl phthalate	ND	230	80	79	1.3	89			40 - 140	30	
Bis(2-chloroethoxy)methane	ND	230	58	54	7.1	71			40 - 140	30	
Bis(2-chloroethyl)ether	ND	130	46	42	9.1	58			40 - 140	30	
Bis(2-chloroisopropyl)ether	ND	230	47	44	6.6	57			40 - 140	30	
Bis(2-ethylhexyl)phthalate	ND	230	83	82	1.2	93			40 - 140	30	
Carbazole	ND	230	73	73	0.0	84			40 - 140	30	
Chrysene	ND	230	72	72	0.0	85			40 - 140	30	
Dibenz(a,h)anthracene	ND	130	69	63	9.1	76			40 - 140	30	
Dibenzofuran	ND	230	69	65	6.0	78			40 - 140	30	
Diethyl phthalate	ND	230	74	70	5.6	81			40 - 140	30	
Dimethylphthalate	ND	230	72	68	5.7	80			40 - 140	30	
Di-n-butylphthalate	ND	670	81	79	2.5	88			40 - 140	30	
Di-n-octylphthalate	ND	230	83	78	6.2	89			40 - 140	30	
Fluoranthene	ND	230	76	73	4.0	82			40 - 140	30	
Fluorene	ND	230	70	66	5.9	78			40 - 140	30	
Hexachlorobenzene	ND	130	69	66	4.4	77			40 - 140	30	
Hexachlorobutadiene	ND	230	55	51	7.5	67			40 - 140	30	
Hexachlorocyclopentadiene	ND	230	14	<10	NC	11			40 - 140	30	l,m
Hexachloroethane	ND	130	40	34	16.2	45			40 - 140	30	l
Indeno(1,2,3-cd)pyrene	ND	230	68	61	10.9	74			40 - 140	30	
Isophorone	ND	130	57	52	9.2	67			40 - 140	30	
Naphthalene	ND	230	56	52	7.4	68			40 - 140	30	
Nitrobenzene	ND	130	63	57	10.0	75			40 - 140	30	
N-Nitrosodimethylamine	ND	230	34	31	9.2	36			40 - 140	30	l,m
N-Nitrosodi-n-propylamine	ND	130	55	50	9.5	66			40 - 140	30	
N-Nitrosodiphenylamine	ND	130	78	75	3.9	87			40 - 140	30	
Pentachloronitrobenzene	ND	230	80	80	0.0	89			40 - 140	30	
Pentachlorophenol	ND	230	90	90	0.0	91			30 - 130	30	
Phenanthrene	ND	130	71	69	2.9	80			40 - 140	30	
Phenol	ND	230	63	56	11.8	74			30 - 130	30	
Pyrene	ND	230	80	77	3.8	86			30 - 130	30	
Pyridine	ND	230	27	27	0.0	35			40 - 140	30	l,m
% 2,4,6-Tribromophenol	59	%	79	77	2.6	87			30 - 130	30	
% 2-Fluorobiphenyl	41	%	56	52	7.4	67			30 - 130	30	
% 2-Fluorophenol	31	%	54	49	9.7	62			30 - 130	30	
% Nitrobenzene-d5	31	%	59	56	5.2	74			30 - 130	30	
% Phenol-d5	39	%	60	54	10.5	70			30 - 130	30	
% Terphenyl-d14	54	%	79	78	1.3	85			30 - 130	30	

Comment:

This batch consists of a Blank, LCS, LCSD and MS.

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 531087 (ug/kg), QC Sample No: CF99299 (CF99429)

Volatiles - Soil (Low Level)

1,1,1,2-Tetrachloroethane	ND	5.0	105	107	1.9	86	87	1.2	70 - 130	30	
1,1,1-Trichloroethane	ND	5.0	100	99	1.0	103	105	1.9	70 - 130	30	
1,1,2,2-Tetrachloroethane	ND	3.0	112	114	1.8	<10	<10	NC	70 - 130	30	m
1,1,2-Trichloroethane	ND	5.0	98	100	2.0	25	21	17.4	70 - 130	30	m
1,1-Dichloroethane	ND	5.0	106	105	0.9	107	111	3.7	70 - 130	30	
1,1-Dichloroethene	ND	5.0	106	105	0.9	166	174	4.7	70 - 130	30	m
1,1-Dichloropropene	ND	5.0	103	103	0.0	107	109	1.9	70 - 130	30	
1,2,3-Trichlorobenzene	ND	5.0	120	121	0.8	110	111	0.9	70 - 130	30	

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
1,2,3-Trichloropropane	ND	5.0	107	110	2.8	90	92	2.2	70 - 130	30	
1,2,4-Trichlorobenzene	ND	5.0	117	119	1.7	103	106	2.9	70 - 130	30	
1,2,4-Trimethylbenzene	ND	1.0	108	108	0.0	104	107	2.8	70 - 130	30	
1,2-Dibromo-3-chloropropane	ND	5.0	105	110	4.7	17	15	12.5	70 - 130	30	m
1,2-Dibromoethane	ND	5.0	102	104	1.9	94	96	2.1	70 - 130	30	
1,2-Dichlorobenzene	ND	5.0	103	104	1.0	94	96	2.1	70 - 130	30	
1,2-Dichloroethane	ND	5.0	103	105	1.9	99	99	0.0	70 - 130	30	
1,2-Dichloropropane	ND	5.0	104	105	1.0	104	104	0.0	70 - 130	30	
1,3,5-Trimethylbenzene	ND	1.0	109	110	0.9	107	111	3.7	70 - 130	30	
1,3-Dichlorobenzene	ND	5.0	103	104	1.0	95	97	2.1	70 - 130	30	
1,3-Dichloropropane	ND	5.0	106	107	0.9	100	102	2.0	70 - 130	30	
1,4-Dichlorobenzene	ND	5.0	104	104	0.0	93	95	2.1	70 - 130	30	
2,2-Dichloropropane	ND	5.0	104	104	0.0	106	109	2.8	70 - 130	30	
2-Chlorotoluene	ND	5.0	103	104	1.0	99	101	2.0	70 - 130	30	
2-Hexanone	ND	25	99	105	5.9	101	110	8.5	70 - 130	30	
2-Isopropyltoluene	ND	5.0	106	105	0.9	104	107	2.8	70 - 130	30	
4-Chlorotoluene	ND	5.0	103	104	1.0	96	98	2.1	70 - 130	30	
4-Methyl-2-pentanone	ND	25	102	107	4.8	106	111	4.6	70 - 130	30	
Acetone	ND	10	98	102	4.0	>200	>200	NC	70 - 130	30	m
Acrylonitrile	ND	5.0	105	107	1.9	>200	>200	NC	70 - 130	30	m
Benzene	ND	1.0	106	107	0.9	106	108	1.9	70 - 130	30	
Bromobenzene	ND	5.0	104	104	0.0	95	98	3.1	70 - 130	30	
Bromochloromethane	ND	5.0	101	101	0.0	96	98	2.1	70 - 130	30	
Bromodichloromethane	ND	5.0	106	106	0.0	70	68	2.9	70 - 130	30	m
Bromoform	ND	5.0	100	102	2.0	72	71	1.4	70 - 130	30	
Bromomethane	ND	5.0	106	104	1.9	95	94	1.1	70 - 130	30	
Carbon Disulfide	ND	5.0	105	104	1.0	91	95	4.3	70 - 130	30	
Carbon tetrachloride	ND	5.0	99	99	0.0	102	106	3.8	70 - 130	30	
Chlorobenzene	ND	5.0	104	104	0.0	99	101	2.0	70 - 130	30	
Chloroethane	ND	5.0	90	88	2.2	80	87	8.4	70 - 130	30	
Chloroform	ND	5.0	102	102	0.0	102	104	1.9	70 - 130	30	
Chloromethane	ND	5.0	102	101	1.0	99	93	6.3	70 - 130	30	
cis-1,2-Dichloroethene	ND	5.0	101	100	1.0	98	104	5.9	70 - 130	30	
cis-1,3-Dichloropropene	ND	5.0	103	104	1.0	81	77	5.1	70 - 130	30	
Dibromochloromethane	ND	3.0	108	108	0.0	69	68	1.5	70 - 130	30	m
Dibromomethane	ND	5.0	99	99	0.0	94	95	1.1	70 - 130	30	
Dichlorodifluoromethane	ND	5.0	95	95	0.0	99	102	3.0	70 - 130	30	
Ethylbenzene	ND	1.0	108	107	0.9	106	108	1.9	70 - 130	30	
Hexachlorobutadiene	ND	5.0	106	104	1.9	108	112	3.6	70 - 130	30	
Isopropylbenzene	ND	1.0	105	106	0.9	105	107	1.9	70 - 130	30	
m&p-Xylene	ND	2.0	105	106	0.9	102	104	1.9	70 - 130	30	
Methyl ethyl ketone	ND	5.0	98	97	1.0	91	99	8.4	70 - 130	30	
Methyl t-butyl ether (MTBE)	ND	1.0	98	99	1.0	91	91	0.0	70 - 130	30	
Methylene chloride	ND	5.0	95	94	1.1	82	81	1.2	70 - 130	30	
Naphthalene	ND	5.0	126	130	3.1	126	130	3.1	70 - 130	30	
n-Butylbenzene	ND	1.0	114	114	0.0	112	116	3.5	70 - 130	30	
n-Propylbenzene	ND	1.0	105	105	0.0	104	106	1.9	70 - 130	30	
o-Xylene	ND	2.0	106	107	0.9	104	106	1.9	70 - 130	30	
p-Isopropyltoluene	ND	1.0	110	111	0.9	109	113	3.6	70 - 130	30	
sec-Butylbenzene	ND	1.0	114	114	0.0	116	120	3.4	70 - 130	30	
Styrene	ND	5.0	108	108	0.0	103	104	1.0	70 - 130	30	
tert-Butylbenzene	ND	1.0	106	105	0.9	106	108	1.9	70 - 130	30	
Tetrachloroethene	ND	5.0	96	98	2.1	100	102	2.0	70 - 130	30	

QA/QC Data

SDG I.D.: GCF99429

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Tetrahydrofuran (THF)	ND	5.0	103	106	2.9	106	112	5.5	70 - 130	30	
Toluene	ND	1.0	105	105	0.0	107	108	0.9	70 - 130	30	
trans-1,2-Dichloroethene	ND	5.0	105	103	1.9	102	104	1.9	70 - 130	30	
trans-1,3-Dichloropropene	ND	5.0	102	106	3.8	81	77	5.1	70 - 130	30	
trans-1,4-dichloro-2-butene	ND	5.0	110	114	3.6	77	70	9.5	70 - 130	30	
Trichloroethene	ND	5.0	99	99	0.0	187	191	2.1	70 - 130	30	m
Trichlorofluoromethane	ND	5.0	96	94	2.1	97	102	5.0	70 - 130	30	
Trichlorotrifluoroethane	ND	5.0	102	100	2.0	106	112	5.5	70 - 130	30	
Vinyl chloride	ND	5.0	108	107	0.9	111	114	2.7	70 - 130	30	
% 1,2-dichlorobenzene-d4	100	%	99	99	0.0	102	103	1.0	70 - 130	30	
% Bromofluorobenzene	102	%	103	103	0.0	105	106	0.9	70 - 130	30	
% Dibromofluoromethane	98	%	101	101	0.0	59	58	1.7	70 - 130	30	m
% Toluene-d8	102	%	102	102	0.0	102	102	0.0	70 - 130	30	

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
m = This parameter is outside laboratory MS/MSD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
May 28, 2020

Thursday, May 28, 2020

Criteria: CT: GAM, I/C, RC

State: CT

Sample Criteria Exceedances Report

GCF99429 - THUNDER

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CF99429	$PEST_SMR	4,4' -DDT	CT / RSR GA,GAA (mg/kg) / APS Organics	11	7.5	3	3	ug/Kg
CF99429	$PEST_SMR	4,4' -DDE	CT / RSR GA,GAA (mg/kg) / APS Organics	15	7.5	3	3	ug/Kg
CF99429	AS-SM	Arsenic	CT / RSR DEC I/C (mg/kg) / Inorganics	21.0	0.78	10	10	mg/Kg
CF99429	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	21.0	0.78	10	10	mg/Kg

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Thunderbird Environmental

Project Location: 2019-096 ***Project Number:***

Laboratory Sample ID(s): CF99429 ***Sampling Date(s):*** 5/20/2020

List RCP Methods Used (e.g., 8260, 8270, et cetera) 6010, 7470/7471, 8081, 8082, 8260, 8270, ETPH

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☑ Yes ☐ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents acheived? See Section: SVOA Narration.**	☐ Yes ☑ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☑ Yes ☐ No ☑ Yes ☐ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☐ Yes ☑ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☐ Yes ☑ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature: Rashmi Makol **Position:** Project Manager

Printed Name: Rashmi Makol **Date:** Thursday, May 28, 2020

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

RCP Certification Report

May 28, 2020

SDG I.D.: GCF99429

SDG Comments

Metals Analysis:
The client requested a shorter list of elements than the 6010 RCP list. Only the RCRA 8 Metals are reported as requested on the chain of custody.

ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

AU-XL2 05/21/20-1 Jeff Bucko, Chemist 05/21/20

CF99429 (1X)

The initial calibration (ETPH211I) RSD for the compound list was less than 30% except for the following compounds: None.
As per section 7.2.3, a discrimination check standard was run (521A003_1) and contained the following outliers: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

QC (Batch Specific):

Batch 530717 (CF99217)

CF99429

All LCS recoveries were within 60 - 120 with the following exceptions: None.
All LCSD recoveries were within 60 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

MERLIN 05/27/20 07:29 Rick Schweitzer, Chemist 05/27/20

CF99429

The method preparation blank, ICB, and CCBs contain all of the acids and reagents as the samples.
The initial calibration met all criteria including a standard run at or below the reporting level.
All calibration verification standards (ICV, CCV) met criteria.
All calibration blank verification standards (ICB, CCB) met criteria.
The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 531068 (CF99298)

CF99429

All LCS recoveries were within 70 - 130 with the following exceptions: None.
All LCSD recoveries were within 70 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-

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NY # 11301

Certification Report

May 28, 2020

SDG I.D.: GCF99429

Mercury Narration

125%.

ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ARCOS-2 05/26/20 07:56 Cindy Pearce, Chemist 05/26/20

CF99429

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 530896 (CF99424)

CF99429

All LCS recoveries were within 75 - 125 with the following exceptions: None.
All LCSD recoveries were within 75 - 125 with the following exceptions: None.
All LCS/LCSD RPDs were less than 35% with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PCB Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

AU-ECD8 05/24/20-1 Saadia Chudary, Chemist 05/24/20

CF99429 (10X)

The initial calibration (PC519AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PC519BI) RSD for the compound list was less than 20% except for the following compounds: None.
The continuing calibration %D for the compound list was less than 15% except for the following compounds:
Samples: CF99429
Preceding CC 524B003 - PCB 1260 -18%L (%)
Succeeding CC 524B017 - None.

QC (Batch Specific):

Batch 530883 (CG00291)

CF99429

All LCS recoveries were within 40 - 140 with the following exceptions: None.
All LCSD recoveries were within 40 - 140 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

PEST Narration

Environmental Laboratories, Inc.
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ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

May 28, 2020

SDG I.D.: GCF99429

PEST Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

AU-ECD35 05/26/20-1 Chelsey Guerette, Chemist 05/26/20

CF99429 (2X)

The initial calibration (PS0522AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PS0522BI) RSD for the compound list was less than 20% except for the following compounds: None.
The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.
The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.
The continuing calibration %D for the compound list was less than 20% except for the following compounds:None.

QC (Batch Specific):

Batch 530884 (CG00291)

CF99429

All LCS recoveries were within 40 - 140 with the following exceptions: None.
All LCSD recoveries were within 40 - 140 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
This Batch consists of Blank, LCS, LCSD and MS.

SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 530775 (Samples: CF99429): -----

One or more analytes is below the method criteria. A low bias for these analytes is possible. (Benzidine, Hexachlorocyclopentadiene, N-Nitrosodimethylamine, Pyridine, 3,3''-Dichlorobenzidine, 4-Chloroaniline)

The LCS and/or the LCSD recovery is below the method criteria. All of the other QC is acceptable, therefore no significant bias is suspected. (3-Nitroaniline, Hexachloroethane)

Instrument:

CHEM19 05/21/20-1 Wes Bryon, Chemist 05/21/20

CF99429 (1X)

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.
For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM19/19_SPLIT_0519):
99% of target compounds met criteria.
The following compounds had %RSDs >20%: 3-Nitroaniline 21% (20%)
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.043 (0.1), Hexachlorobenzene 0.094 (0.1)
The following compounds did not meet a minimum response factors: 2-Nitrophenol 0.043 (0.05)

Continuing Calibration Verification (CHEM19/0521_07-19_SPLIT_0519):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

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SVOA Narration

The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.046 (0.1), Hexachlorobenzene 0.096 (0.1)
The following compounds did not meet minimum response factors: None.

QC (Batch Specific):

Batch 530775 (CF99216)

CF99429

All LCS recoveries were within 40 - 140 with the following exceptions: 3,3'-Dichlorobenzidine(<10%), 3-Nitroaniline(35%), 4-Chloroaniline(20%), Benzidine(<10%), Hexachlorocyclopentadiene(14%), N-Nitrosodimethylamine(34%), Pyridine(27%)
All LCSD recoveries were within 40 - 140 with the following exceptions: 3,3'-Dichlorobenzidine(<10%), 4-Chloroaniline(22%), Benzidine(<10%), Hexachlorocyclopentadiene(<10%), Hexachloroethane(34%), N-Nitrosodimethylamine(31%), Pyridine(27%)
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
This batch consists of a Blank, LCS, LCSD and MS.
Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

CHEM31 05/22/20-1 Jane Li, Chemist 05/22/20

CF99429 (1X)

Initial Calibration Evaluation (CHEM31/VT-L051520):
95% of target compounds met criteria.
The following compounds had %RSDs >20%: 1,2-Dibromo-3-chloropropane 25% (20%), Bromoform 27% (20%), Methyl Ethyl Ketone 24% (20%), Naphthalene 35% (20%)
The following compounds did not meet Table 4 recommended minimum response factors: Acetone 0.084 (0.1), Bromoform 0.081 (0.1), Tetrachloroethene 0.169 (0.2)
The following compounds did not meet the minimum response factor of 0.05: None.

Continuing Calibration Verification (CHEM31/0522_02-VT-L051520):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet Table 4 recommended minimum response factors: None.

QC (Batch Specific):

Batch 531087 (CF99299) CHEM31 5/22/2020-1

CF99429(1X)

All LCS recoveries were within 70 - 130 with the following exceptions: None.
All LCSD recoveries were within 70 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-

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VOA Narration

160% for Chloroethane-HL and Trichlorofluoromethane-HL.

Temperature Narration

The samples were received at 2.8C with cooling initiated.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

Cooler: Yes [X] No [ ]
Coolant: IPK [ ] ICE [X] No [ ]
Temp 2.8 °C Pg 1 of 1

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery/Contact Options:
[ ] Fax:
[ ] Phone:
[X] Email: Lauren@tbirdenv.com

Customer: Thunderbird Environmental
Address: 14 Leffingwell Rd.
Clinton, CT 06413

Project: 2019-096
Report to: Lauren Lomax
Invoice to: Dawn Hittle
QUOTE #

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 5/20/20

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	ETPH	VOCs 8260	SVOCs 8270	PCBs 8082	RCRA 8 Metals	Ignitability	PGim Filter	Pesticides	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [1] methanol [2] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
99429	WC-1	S	5/20/20	1015	X	X	X	X	X	X	X	X		3	3									6

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	5-21-20	12:21
	[signature]	5/21/20	10:16

Comments, Special Requirements or Regulations:

Turnaround Time:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] (Residential) Direct Exposure
[ ] (Comm/Industrial) Direct Exposure
[ ] GA Leachability
[ ] GB Leachability
[ ] GA-GW Objectives
[ ] GB-GW Objectives

CT
[X] RCP Cert
[ ] GW Protection
[ ] SW Protection
[X] GA Mobility
[ ] GB Mobility
[X] Residential DEC
[X] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1 [ ] MWRA eSMART
[ ] GW-2
[ ] GW-3
[ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
[ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
[ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
[ ] SW Protection

State where samples were collected: CT

Data Format
[X] Excel
[X] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[X] Phoenix Std Report
[ ] Other
* SURCHARGE APPLIES

CLEANEARTH

NON-RCRA HAZARDOUS WASTE MANIFEST

1871225

1. GENERATOR'S NAME AND MAILING ADDRESS Town of Westport 110 Myrtle Avenue Westport, CT 06880 2. GENERATOR'S PHONE (203) 341-1125			GENERATOR'S SITE ADDRESS Baron S South Property 52 Compo Road South Westport, CT 06880 (Approval # - 204071072)
3. TRANSPORTER 1 COMPANY NAME Herbert Recovery	4. US EPA ID NUMBER NOT APPLICABLE	A. TRANSPORTER 1'S PHONE (203) 938 7066	TRANSPORTER'S PLATE NUMBER K76898
5. TRANSPORTER 2 COMPANY NAME	6. US EPA ID NUMBER NOT APPLICABLE	B. TRANSPORTER 2'S PHONE ( )	TRANSPORTER'S PLATE NUMBER
7. DESIGNATED FACILITY NAME AND SITE ADDRESS CLEAN EARTH OF CONNECTICUT 58 NORTH WASHINGTON STREET PLAINVILLE, CT 06062	8. MAILING ADDRESS CLEAN EARTH OF CONNECTICUT 58 NORTH WASHINGTON STREET PLAINVILLE, CT 06062	C. FACILITY'S PHONE (860) 747-8888	

9. US DOT DESCRIPTION (INCLUDING PROPER SHIPPING NAME, HAZARD CLASS, AND ID NUMBER	10. CONTAINERS NO.	10. CONTAINERS TYPE	11. TOTAL QUANTITY	12. UNIT WT/VOL
a. CONNECTICUT REGULATED WASTE SOLID, NONE, NONE	001	DT	00020	T
b.				
c.				

D. ADDITIONAL DESCRIPTIONS FOR MATERIALS LISTED ABOVE	E. HANDLING CODES FOR WASTES LISTED ABOVE	
	INTERIM	FINAL
SOIL CONTAMINATED WITH PETROLEUM HYDROCARBONS	SO2	T57

13. SPECIAL HANDLING INSTRUCTIONS AND ADDITIONAL INFORMATION

14. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport by highway according to applicable national governmental regulations, and all applicable State of Connecticut laws and regulation. I certify that this material neither contains polychlorinated biphenyls (PCB's) in concentrations greater than 25 ppm, nor has been mixed in anyway with PCB's in concentrations greater than or equal to 50 ppm. I certify that the material listed above contained no free liquids at the time of loading.

PRINTED/TYPED NAME	SIGNATURE	MONTH	DAY	YEAR
Angelo Signore as agent for Town of Westport		6	16	20

15. TRANSPORTER 1 ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS

PRINTED/TYPED NAME	SIGNATURE	MONTH	DAY	YEAR
Gary Herbert	Gary Herbert	6	16	20

16. TRANSPORTER 2 ACKNOWLEDGEMENT OF RECEIPT OF MATERIALS

PRINTED/TYPED NAME	SIGNATURE	MONTH	DAY	YEAR

17. DISCREPANCY INDICATION SPACE

11(a) CORRECTED WEIGHT AS SCALED 7.58 TON'S

18. FACILITY OWNER OR OPERATOR: CERTIFICATION OF RECEIPT OF WASTE MATERIALS COVERED BY THIS MANIFEST EXCEPT AS NOTED IN ITEM 13.

PRINTED/TYPED NAME	SIGNATURE	MONTH	DAY	YEAR
		6	16	20

FACILITY TO GENERATOR

Clean Earth of Connecticut
58 North Washington Street
Plainville, CT
Ph: Fax:

Manifest: 1871225
Vehicle: K76898CT
Decal:

Customer: THUNDERBIRD ENVIRONMENTAL
Generator: Town of Westport
Address: 110 Myrtle Avenue
Westport 06880

Material: Recyclable soil/rock/material
Comment:
Driver:

Ticket: 2244463

	Date	Time	Scale
In:	06/16/2020	10:10:08	CECT
Out:	06/16/2020	10:10:08	CECT
	Lbs	Tn	
Gross:	42340.00	21.17	
Tare:	27180.00	13.59	
Net:	15160.00	7.58	

Carrier:
Profile #: 204071072
Job: Baron's South Property
Address: 52 Compo Road South
Westport, CT 06880

Facility: Clean Earth of Connecticut
Nora Euvrard

Clean Earth of Connecticut
58 North Washington Street
Plainville, CT
Ph: Fax:

Manifest: 1871225
Vehicle: K76898CT
Decal:

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