Village Creek Salt Marsh Restoration Demonstration

Technical Report

Norwalk Land Trust &
Village Creek Harbor Corporation
Norwalk, Connecticut

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Executive Summary

A combined field assessment and feasibility study was conducted by Fuss & O'Neill on behalf of The Norwalk Land Trust, in conjunction with the Village Creek Harbor Corporation. The Norwalk Land Trust and the Village Creek Harbor Corporation., seeks to develop planning and conceptual design necessary to implement the restoration of degraded salt marshes associated with Village Creek in Norwalk, Connecticut.

Fuss & O'Neill conducted field assessments at the project site to evaluate dominant vegetative communities on the site and to collect soil/sediment core samples for laboratory analysis in support of restoration design. Through review of the site and data, a preliminary assessment conceptual approach to restoration design for the Village Creek salt marsh project area using deposition of dredged sediment ("elevation enhancement" or "thin layer deposition," TLD).

To advance toward a salt marsh restoration plan, a phased approach to survey the site, evaluate the sediment, design the project, model the behavior of the components, consider the environmental impact, and put a monitoring system in place was implemented. The specific objectives of this study were to develop a preliminary site assessment; survey topographic and bathymetric conditions; characterize soil /sediment conditions; evaluate soil settling and compaction properties; develop conceptual design options; and establish baseline site monitoring conditions.

The Village Creek salt marsh was evaluated in the context of its historical and existing position in the landscape. The salt marsh has been subject to development pressure since the early 1900's. 1934 aerial photographs show some limited development adjacent to the salt marsh – then over 87 acres in size. This development expanded against and into the salt marsh until present where the salt marsh area has been reduced to 29.5 acre

While physical alteration and encroachment on the Village Creek salt marsh ecosystem has stopped, the ecosystem is still subject to land use pressures, notably pollution from historical releases and ongoing non-point sources. The Village Creek salt marsh ecosystem exhibits typical conditions of a moderately degraded salt marsh located in a developed area including: dominance of low-marsh species and a lack of high-marsh vegetation species; persistent mosquito ditches resulting in expanded areas of vegetation dieback; and development of stands of *Phragmites australis* along the perimeter of the salt marsh.

To evaluate overall condition of the Village Creek salt marsh ecosystem, a vegetation community survey was conducted. This vegetation survey was conducted in concert with a detailed elevation survey (bathymetric and topographic) to develop biobenchmarks for this specific salt marsh ecosystem. Biobenchmarks are detailed inventory of vegetation species across a ecological landscape (i.e., salt marsh). Species are statistically correlated with elevations to establish zones (ranges of elevations) where salt marsh species are likely to thrive. The zones are then compared to tidal benchmark datum to establish the current relationship between tidal cycles and vegetation communities.

To support the vegetation community survey, a detailed elevation survey was completed using aerial photogrammetric equipment on an unmanned aerial vehicle (UAV a.k.a. drone). Elevations were collected at centimeter accuracy across the Village Creek salt marsh and estuary. Vegetation survey sampling occurred along the seven transects and accounted the dominant vegetative species at regular intervals along each transect. These seven vegetation transects will serve as a baseline and long term monitoring stations for future assessment s of the salt marsh.

Biobenchmarking of the Village Creek salt marsh reveals a traditional distribution of low-marsh to high marsh ecotones across elevations. *Spartina alterniflora* (smooth cordgrass) dominates a wide range of elevations (0.00 ft and 4.67 ft NAVD88[1] which is typical of this low salt marsh species. At the upper limits of the elevation range (3.27 to 4.67 ft NAVD88), *S. alterniflora* becomes stunted. Stunted *S. alterniflora* becomes interspersed with *Spartina patens* (salt marsh hay) and *Disticlis spicata* (salt grass). *S. patens* and *D. spicata* are considered high marsh species and occupy an elevation range between 3.67 and 4.42 ft NAVD88. Considerable areas of bare soil were observed in many locations where stunted *S. alterniflora*, *S. patens* and *D. spicata* were documented as the principal species. *Iva frutescens* (high tide bush) and *P. australis* (common reed) occupy elevations above 4.42 ft NAVD88.

In order to maximize future succession and establishment of high marsh plant communities and thereby increase future resiliency of this salt marsh due to sea level rise, it is recommended that the restoration approach should, at the very least target, the high end of the elevation ranges inhabited by desired vegetative species: 3.95 to 4.42 ft NAVD88 for *S. patens* and *D. spicata* and 4.50 to 5.85 ft NAVD88 for *I. frutescens*.

In addition to assessing the restoration area's salt marsh elevations and plant communities, six soil cores were collected to evaluate soil strata. In each core, the upper organic soil layer can be clearly distinguished from the reduced (gleyed) mineral sandy layer of the core. It was observed during the soil sampling process that the integrity of the peat has been significantly reduced, which should be considered as restoration options are evaluated.

The soil data was assessed to estimate the amount of compaction that will occur as a result of placing dredged soil over the existing marsh surface. The thickness of the peat layer through the vegetated marshes along Village Creek and underlying sandy material is likely to provide a stable base upon which additional material may be placed. Based on strata (peat and mineral) thicknesses it is estimated that the potential compaction will be less than 0.5 inch from sediment placement depths of 6 inches or less, and up to approximately 1.5 inches of compaction for sediment placements depths equal to 12 inches.

Soil samples were collected and submitted for analysis of chemical constituents including metals, polycyclic aromatic hydrocarbons (PAHs), Polycyclic biphenyls (PCBs) and Extractable Petroleum Hydrocarbons (ETPH). Results were compared to upland disposal standards. Results were also compared to concentrations of test parameter for the proposed dredge area. A review of the data indicated that there are elevated concentrations of metals in the salt marsh soils. These elevated concentrations were observed in the northern reaches of the Village Creek salt marsh. Concentrations were consistent with samples collected for dredging of the Harbor and channel. In contrast, concentrations of parameters at the southern reaches of the Village Creek salt marsh were consistently lower than samples collected for dredging of the Harbor and channel. Consequently, plans for use of harbor dredge sediments for TLD should focus on the northern reaches of the Village Creek salt marsh in an effort to be consistent with CT DEEP beneficial reuse and anti-degradation policies.

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[1] All elevations reference the 1988 North America Vertical Datum (NAVD88)

There are numerous considerations when creating a salt marsh restoration plan. This preliminary assessment considers current and target marsh vegetation communities' requirements, existing soils and potential compaction, existing tidal data, future sea level rise, and the restoration construction methodology. In addition, regulatory constraints and stakeholder concerns (e.g., residential and commercial community impacts) are considered.

Fuss & O'Neill has also evaluated the projected rates of global sea level rise and updated them for the local area based on the documented eustatic changes that are occurring in New England to develop an expected range of sea level rise. Given the uncertainties inherent in projecting future sea levels, for the purposes of this project, the most appropriate projection and out-year would be the total increase in sea level rise by 2040 for the intermediate scenario. This projects an increase of 1.25 feet by the year 2040 (model start year of 2000). By 2040, proposed areas with elevations up to 5.85 ft NAVD88, which are currently suitable for only *I. frutescens*, will become ideal habitat for high marsh species, such as *S. patens*, *D. spicata and J. gerardii*. The proposed plan balances the elevation requirements of the marsh vegetation to current conditions with those of increased resiliency for the future

Through a review of field conditions, aerial photogrammetry, elevation mapping and vegetative data, several targeted sub-areas were identified for restoration within the salt marsh project area. The primary driver for this decision of placement area is sediment and soil quality. Therefore, areas in the northern reaches of the Village Creek salt marsh were identified as ideal candidate for TLD salt marsh restoration. This selection is based on the similarity between pollutants in marsh soil and in dredge sediment. Other factors that make these areas preferable are level of habitat degradation (i.e. areas of stressed vegetation, areas of shallow impounded water, bare sections, etc.), accessibility, and the presence of enough contiguous area that would make restoration activities more feasible and economical.

Ultimately, the targeted placement elevation for TLD in the northern reaches of the Village Creek salt marsh would be 5.09 ft NAVD88 with a settled elevation of 4.97 ft NAVD88. The targeted placement elevation accounts for both vegetation and soil quality properties. With regard to the latter, to account for the minor compaction that will likely occur during and following placement of dredged material, the overall estimate of final elevation incorporates up to 1.5 inches of compaction and settling. Once material has been placed and is allowed to settle, the anticipated final elevation is 4.97 ft NAVD88. By targeting 4.97 ft NAVD88 as a settled fill elevation the resulting marsh platform elevations will provide increased resiliency for this system into the future.

Salt marsh restoration, and thin layer deposition as one method, is a viable strategy for protecting and preserving existing or historical resources in coastal and estuarine systems. The salt marsh restoration options proposed in this assessment represent an economical and ecologically efficient means of disposing dredge material from the nearby harbor. Salt marsh restoration through thin layer deposition maintains or improves the biological and ecological functions and enhances the social and economic values of resources otherwise threatened by encroachment from upland areas and loss due to sea level rise. Salt marshes play an integral role in supporting and protecting not only Village Creek but Long Island Sound as well. The final design and implementation of the proposed salt marsh restoration will, understandably, require the endorsement of stakeholders including adjacent property and home owners, and local, state and federal regulatory agencies.

1 Introduction

This technical report presents the combined field assessment and feasibility study conducted by Fuss & O'Neill on behalf of The Norwalk Land Trust, in conjunction with the Village Creek Harbor Corporation. The Norwalk Land Trust and the Village Creek Homeowners Association., sought to develop planning and conceptual design necessary to implement the restoration of degraded salt marshes associated with Village Creek in Norwalk, Connecticut.

Fuss & O'Neill conducted field assessments at the project site to evaluate dominant vegetative communities on the site and to collect soil/sediment core samples for laboratory analysis in support of restoration design. Through review of the site and data, a preliminary assessment conceptual approach to restoration design for the Village Creek salt marsh project area using deposition of dredged sediment ("elevation enhancement" or "thin layer deposition," TLD). This report outlines the goals of the project, reviews the existing conditions data (elevation and vegetation surveys, soil cores and laboratory analyses, and surrounding resources areas), discusses primary restoration design considerations, and outlines principal adaptive management considerations.

1.1 Project Goals

With any restoration project, it is critical to identify the general goals, as these will guide the overall restoration design and the decisions made during the adaptive management process. These goals need to be defined, parameterized, and quantified, but must be flexible enough for adjustments to be made during project implementation by review of field conditions and for nature to run its course once direct manipulation of the site is initially complete.

For this Village Creek salt marsh restoration demonstration project, the principal goal is to ascertain the feasibility of using sediment dredged from the Village Creek Harbor and channel to increase the resiliency of the marsh to sea level rise by increasing its elevation in targeted areas. Secondary goals include increasing the area of the marsh dominated by high marsh species, such as *Spartina patens*, *Distichlis spicata*, and *Juncus gerardii*; create a mosaic of marsh habitat types; and improve marsh drainage to avoid ponding of freshwater that may degrade stands of these coastal plant species.

To advance toward a salt marsh restoration plan, this report is a summary of a phased approach to survey the site, evaluate the sediment, design the project, model the behavior of the components, consider the environmental impact, and put a monitoring system in place. The objectives of this study are summarized below:

1. Preliminary Site Assessment - An analysis of existing vegetation in the surrounding marsh compared to historical photos of the site.
2. Topographic and Bathymetric Survey - A topographic and bathymetric survey will be performed on the subject areas to determine the plant communities, the topography and likely areas for restoration.
3. Soil Characterization - The characteristics of the soil for particle size and contaminants will be determined.
4. Soil Settling and Compaction Properties - Conceptual modeling will be performed to determine area and volume calculations.
5. Design - The design of a saltmarsh restoration approach for the proposed target areas.

6. Site Monitoring Baseline - A monitoring program baseline will be established to track the changes in the affected area.

The information generated from this work will provide the foundation to implement a salt marsh restoration program with a focused project plan that increases the likelihood of success and yields a measureable improvement in the environmental health and quality of the habitat of the area.

2 Preliminary Site Assessments

2.1 Data Resources

An understanding of the existing conditions at the site as well as historical changes is necessary to develop an accurate restoration design. The project team utilized the following data to evaluate the existing conditions at the site in support of planned TLD activities:

- Existing bathymetric elevations were obtained from a hydrographic survey performed by Coastline Consulting & Development (October 2015)
- Existing marsh surface elevation data was obtained from a topographic survey performed in June 2017 by AirShark UAV Services
- Historical aerial mapping available from the Connecticut Department of Energy and Environmental Protection (DEEP) and the University of Connecticut obtained in 1934
- Plant species composition and elevation data from field evaluations by Fuss & O'Neill in June 2017,
- Observation of soil cores taken by Fuss & O'Neill in June 2017, which were subsequently characterized and tested by laboratory physical and chemical analyses

2.2 Existing and Historical Conditions

Village Creek and its associated wetlands are a moderately degraded coastal salt marsh ecosystem. Since the early 1900's the Village Creek salt marsh ecosystem has been subject to increased development pressure and encroachment. Currently, the Village Creek salt marsh ecosystem is bounded on three of its four sides by industrial, commercial, or residential development (*Figure 1*). This is a significant change from the condition of the system as depicted in the 1934 aerial imagery (*Figure 2*).

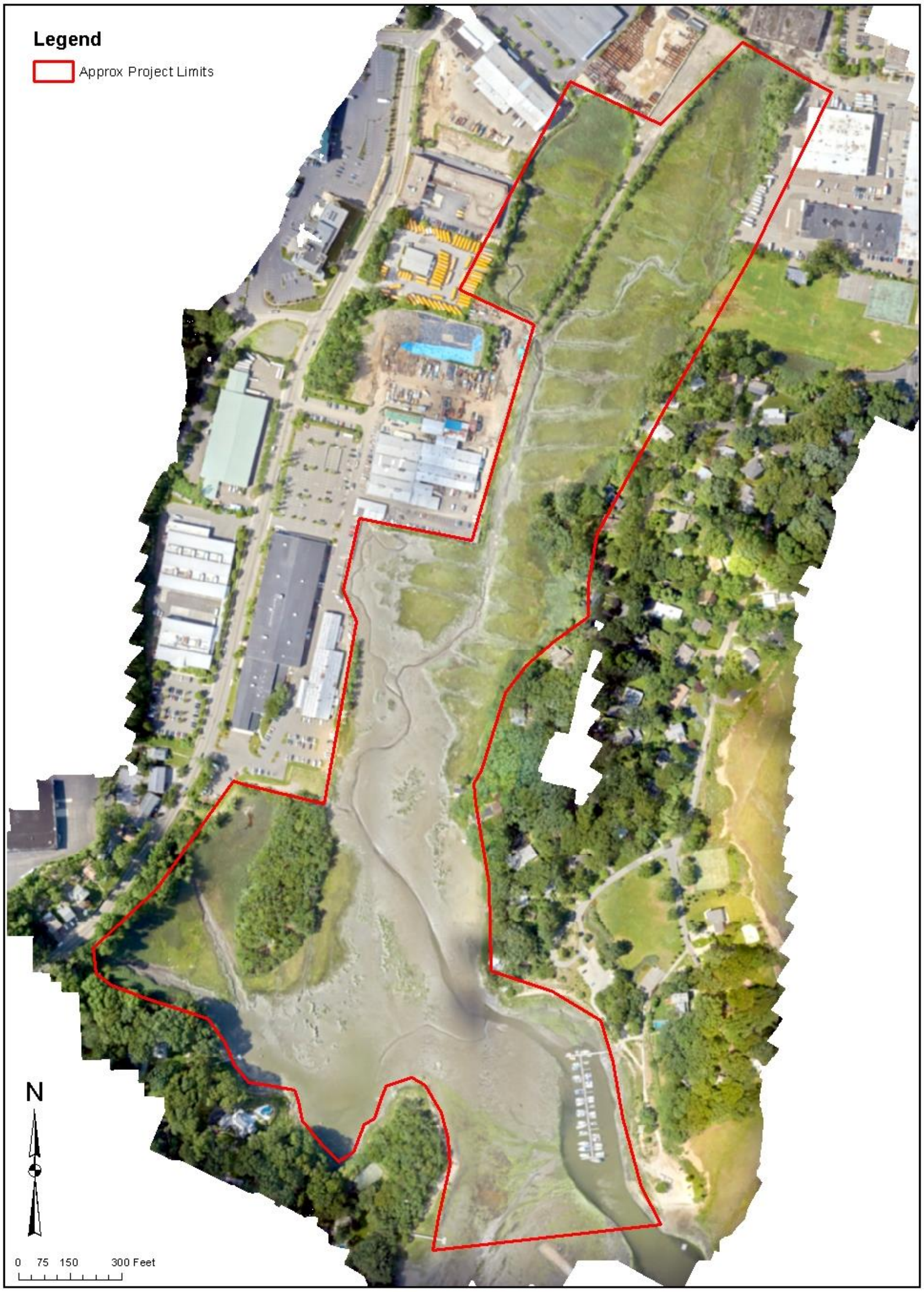

Figure 1. Aerial Image of Village Creek Salt Marsh and Surrounding Area (2017)

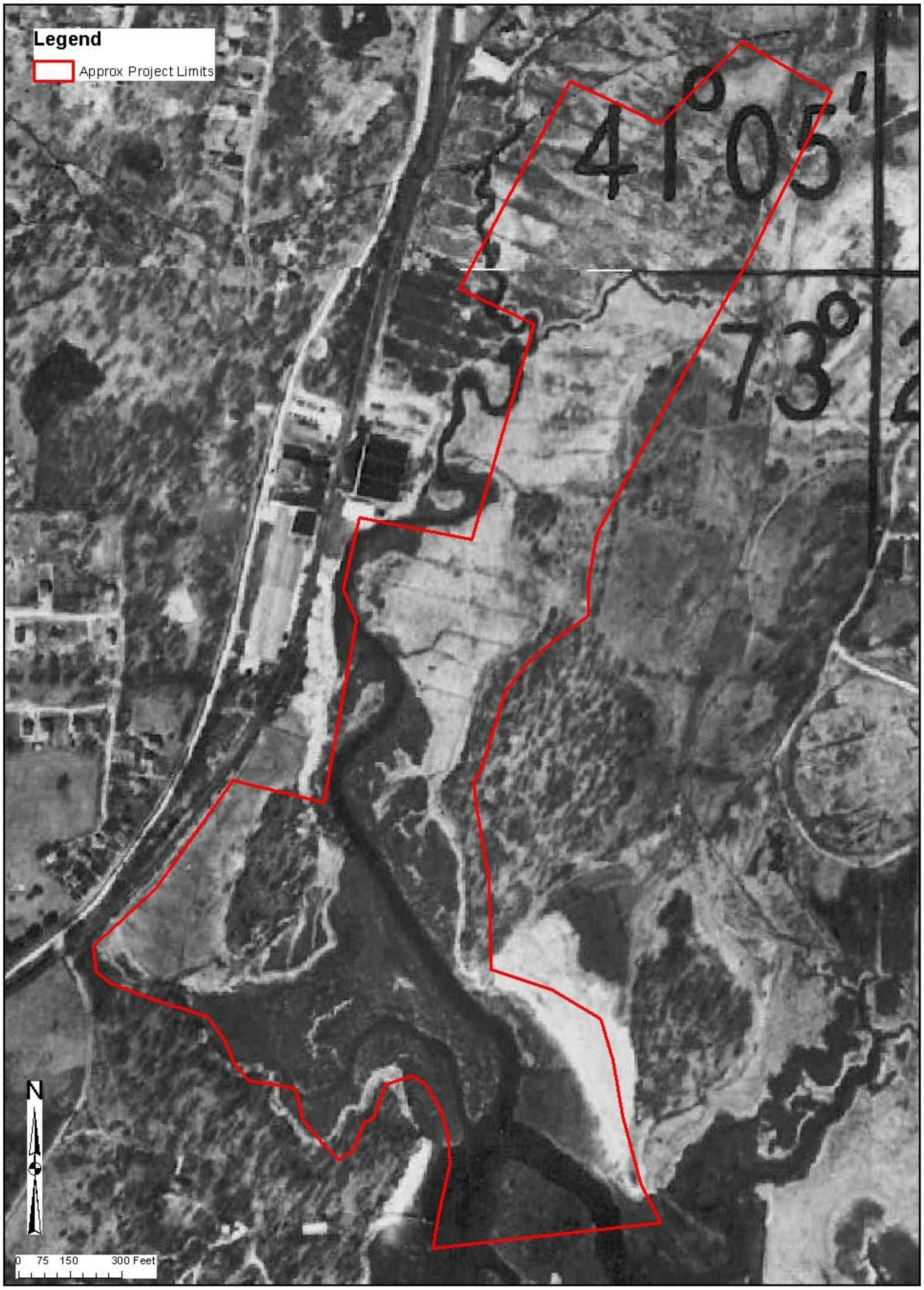

Figure 2. 1934 Aerial Imagery of Village Creek Salt Marsh and Surrounding Area

In 1934 the Village Creek salt marsh ecosystem was fairly extensive expanding well to the north, west and east. At that time the estimated salt marsh area was 87 acres. In 1934 initial evidence of development pressures are evident to the west with railroad and industrial facilities. Another early sign of development pressure are the numerous mosquito ditches that bisect the marsh: a comment alteration of New England salt marshes around this time period. From 1934 to present filling, draining and other methods of "wetland reclamation" progressed until more than two-thirds of the Village Creek salt marsh ecosystem was lost (*Figure 3*). The estimated area of the Village Creek salt marsh ecosystem is 29.5 acres. This includes formerly vegetated areas that have degraded and become unvegetated.

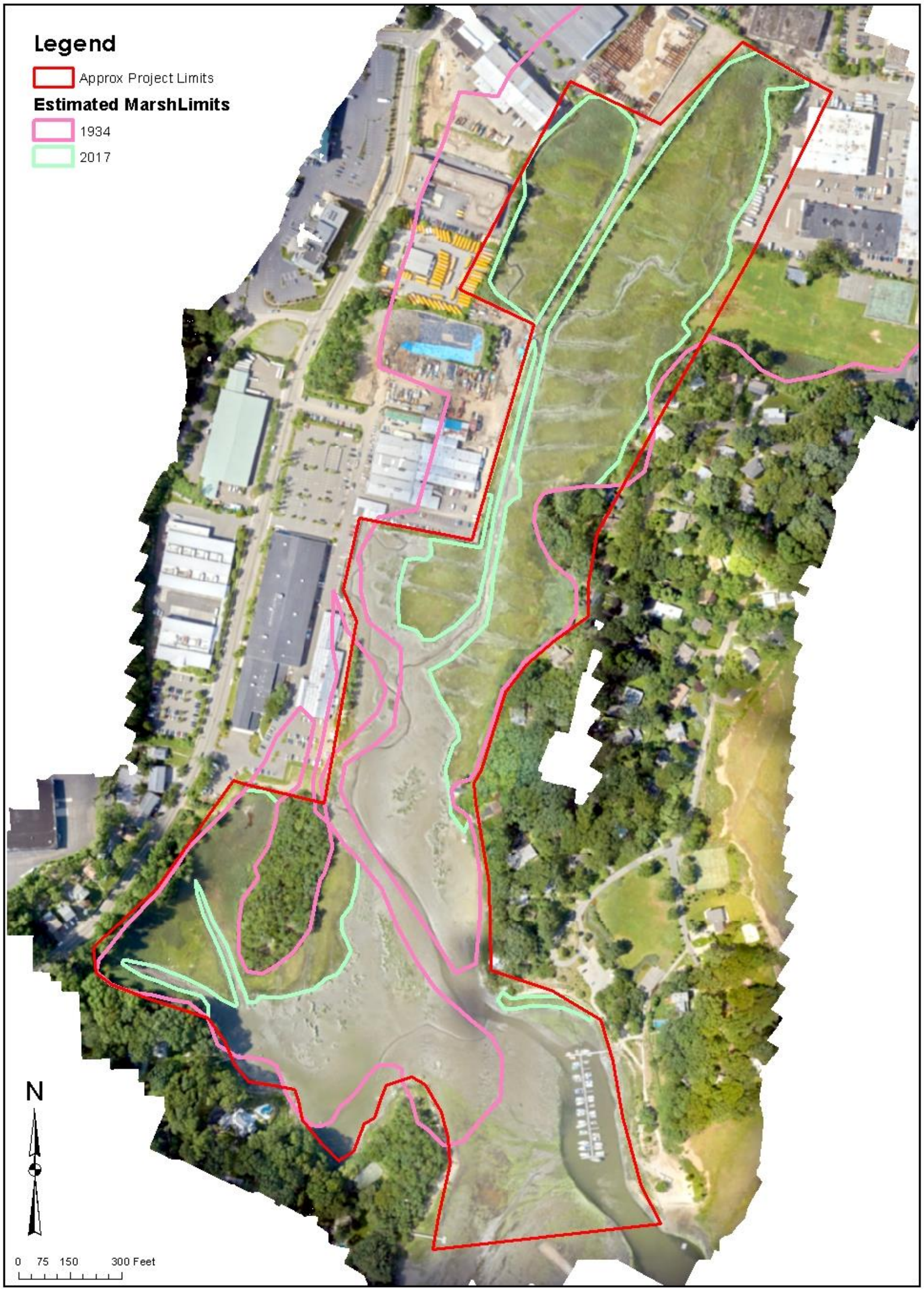

Figure 3. Estimated Limits of Village Creek Salt Marshes from 1934 and 2017

While physical alteration and encroachment on the Village Creek salt marsh ecosystem has stopped, the ecosystem is still subject to land use pressures, notably pollution from historical releases and ongoing non-point sources. The Village Creek salt marsh ecosystem exhibits typical conditions of a moderately degraded salt marsh located in a developed area including:

- Dominated by low-marsh Salt Marsh Cordgrass (*Spartina alterniflora*) and a lack of high-marsh Salt Marsh Hay (*S. patens*), Saltgrass (*Distichlis spicata*) and Blackgrass (*Juncus gerardii*).
- Persistent mosquito ditches that, overtime, have resulted in expanded areas of vegetation dieback due to prolonged inundation
- Development of stands of Common Reed (*Phragmites australis*) along the edges of the typical of modified tidal regimes, reduced salinity, degraded water quality, and low-quality fill

2.3 Topographic, Bathymetric and Vegetation Surveys

To evaluate overall condition of the Village Creek salt marsh ecosystem, a vegetation community survey was conducted. This vegetation survey was conducted in concert with a detailed elevation (bathymetric and topographic) survey to develop biobenchmarks for this specific salt marsh ecosystem. Biobenchmarks allow for the correlation between marsh surface elevation and vegetation communities. Zones (elevation ranges) of existing vegetation communities can be derived from this correlation analysis. This is done by establishing several transect across the marsh surface and inventorying dominant plant communities at regular intervals (plots). Each plot (horizontal) is associated with an elevation (vertical).

2.3.1 Topographic and Bathymetric Survey

Based on a review of the aerial photogrammetry, elevation mapping and a site visit, preliminary targeted restoration areas were identified, designated as Restoration Areas "A" through 'L' on *Figure 4*.

To support the vegetation community survey, a detailed elevation survey was completed in June 2017 by AirShark UAV Services. Using aerial photogrammetric equipment on an unmanned aerial vehicle (UAV), elevation data was collected relative to North American Vertical Datum of 1988 (NAVD88) and is presented in *Figure 4*.

Figure 5 illustrates that, while there are some higher areas around the margins of the marsh, the majority of the marsh platform is below an elevation of 6.00 ft NAVD88, with much of it actually below 4.00 ft NAVD88. Relative to tidal benchmarks for the estuary (*Table 1*), areas below 4.00 ft NAVD88 are most likely to support healthy salt marsh vegetation communities under current conditions. The elevation of 4.00 ft NAVD88 also serves as a reference point for evaluating potential changes in salt march ecosystem as sea level continues to rise (see *Section 3*.0)

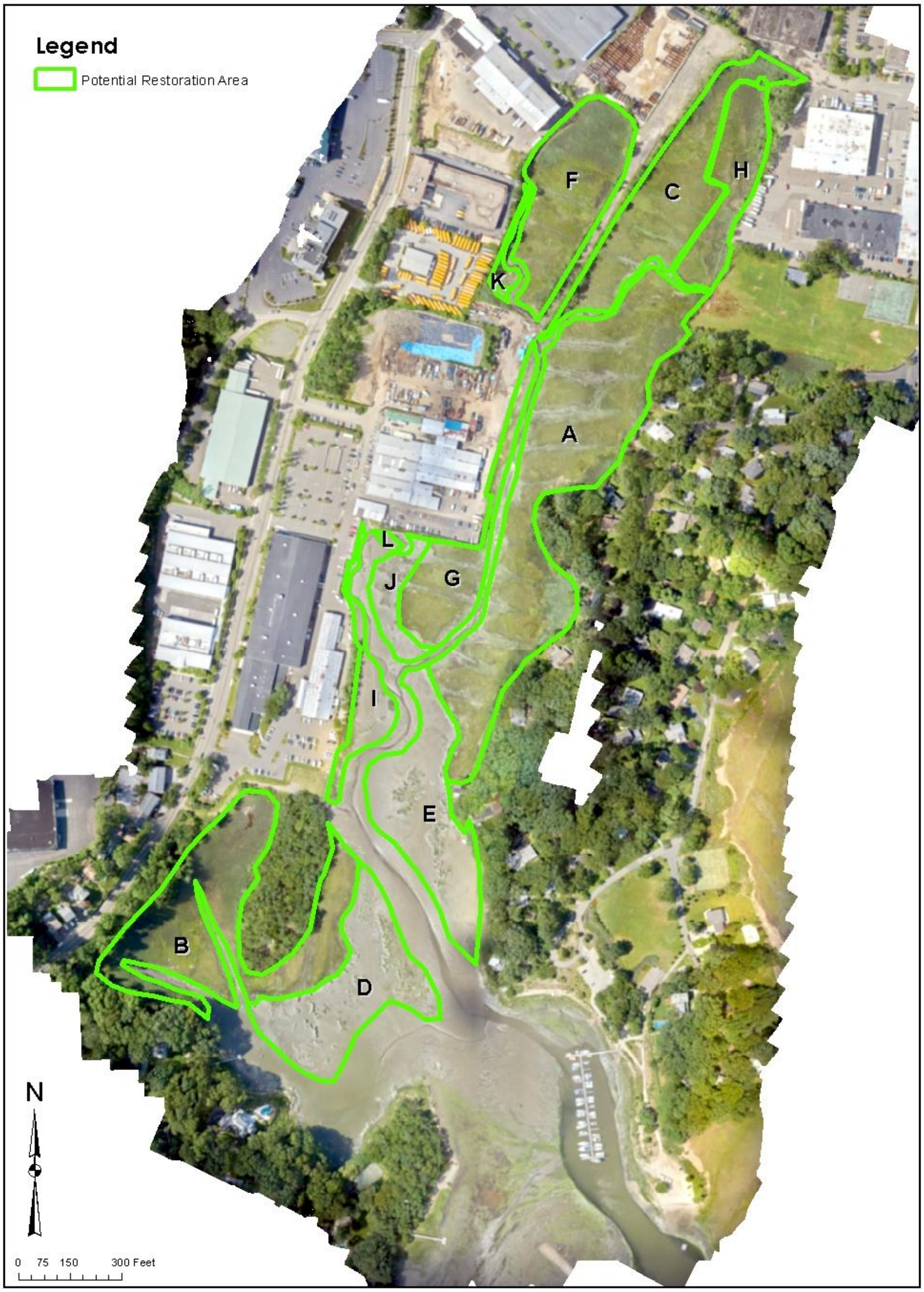

Figure 4. Village Creek Salt Marsh Restoration Areas

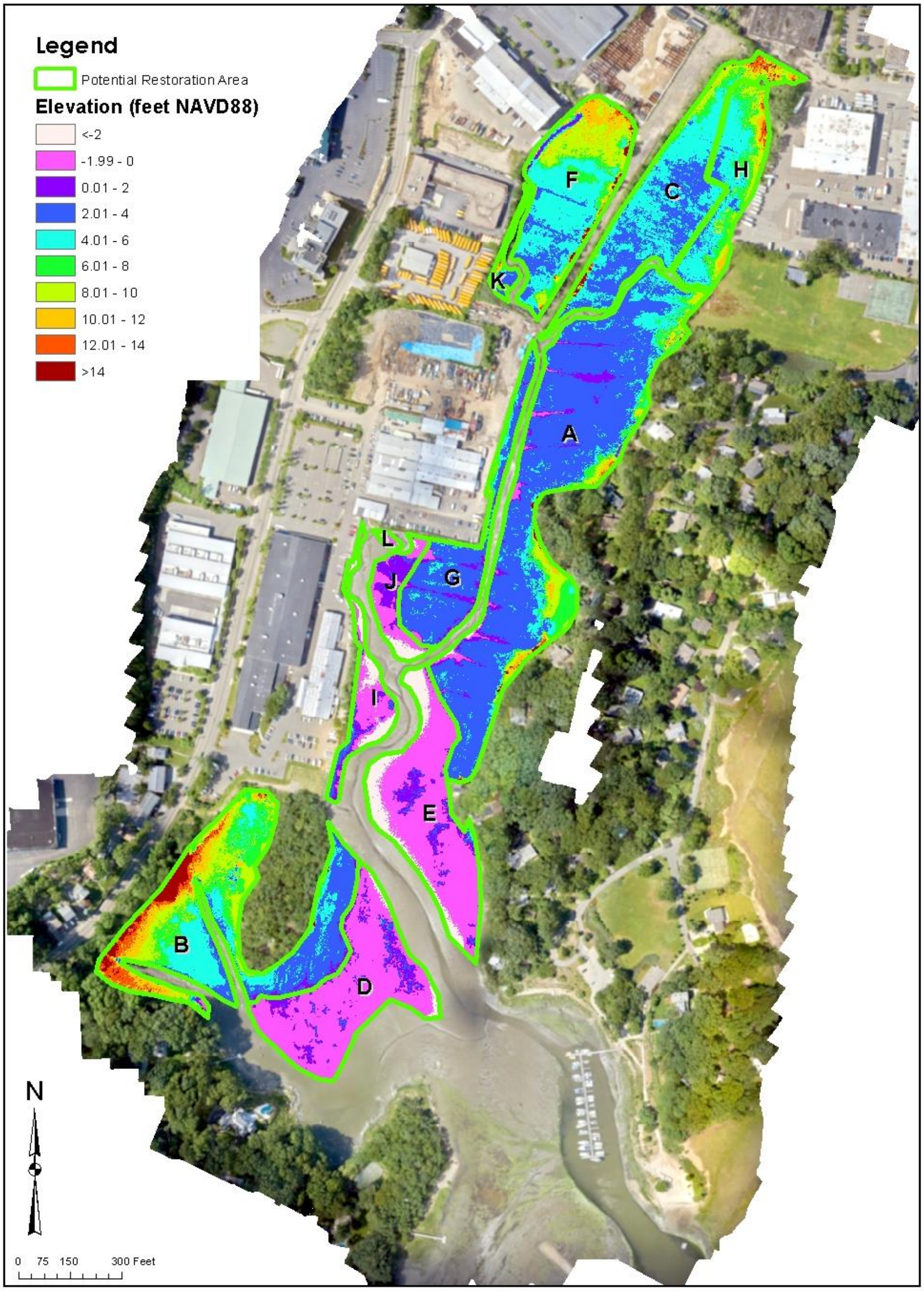

Figure 5. Hypsometric Zones of Village Creek Salt Marsh

Many of these lower elevation areas have transitioned from healthy salt marsh vegetation to sections of stunted and/or stressed *Spartina alterniflora* or to entirely bare areas in recent years. Furthermore, given the sea level rise predictions for this area (see discussion below), the marsh vegetation within these areas of low elevation will be further stressed and become even less likely to support a healthy salt marsh community.

2.3.2 Present Tidal Data

Tidal benchmarks for the area were identified for Village Creek and the salt marsh based on NOAA tidal data station in South Norwalk (Station ID 8468448)[2]. Given its proximity to Village Creek, this tidal station is a suitable surrogate to site-specific data (*Table 1*).

Table 1. South Norwalk (8468448) Tidal Data

Tidal Datum[3]	Elevation (feet NAVD88)
Mean Higher High Water (MHHW)	3.69
Mean High Water (MHW)	3.35
Mean Tide Level (MTL)	-0.19
Mean Low Water (MLW)	-3.72
Mean Lower Low Water (MLLW)	-3.98

2.3.3 Vegetation Survey

Sampling occurred along the seven vegetation sampling transect locations that were developed to assess the dominant vegetative communities within the potential restoration areas at the Site. Permanent vegetation transects were established across the Restoration Areas to obtain a representative sample of community types across various elevations and hydrologic conditions. These seven vegetation transects will also serve as long term monitoring stations (*Figure 7*). The data collected as part of this initial effort will serve as a baseline for future assessment s of the salt marsh under existing conditions or following restoration efforts.

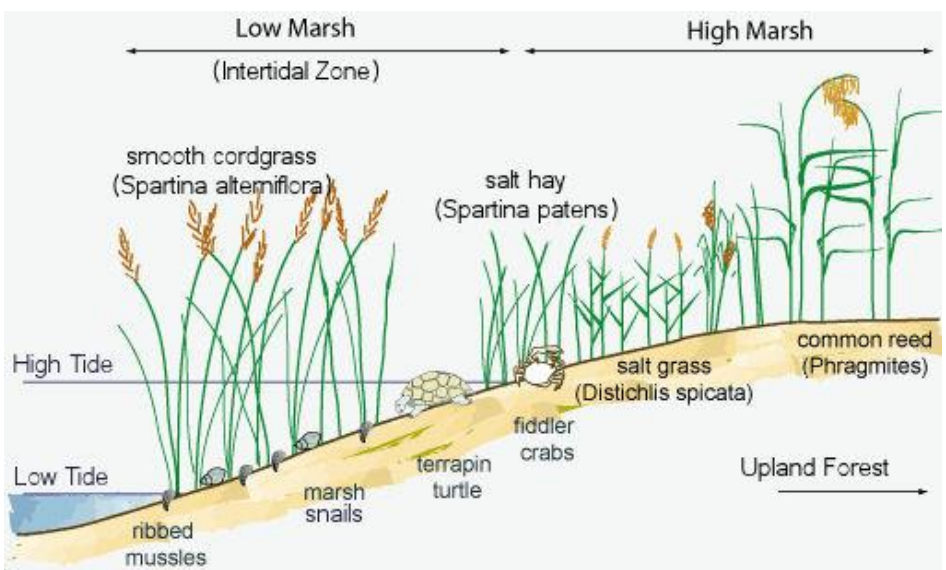

Figure 6. Typical Cross-Section of New England Salt Marsh

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[2] NOAA. 2003. Benchmark Sheet fo4 8468448, South Norwalk, CT (https://tidesandcurrents.noaa.gov/benchmarks.html?id=8468448)

[3] Tidal benchmark datums are defined by NOAA (https://tidesandcurrents.noaa.gov/datum_options.html).

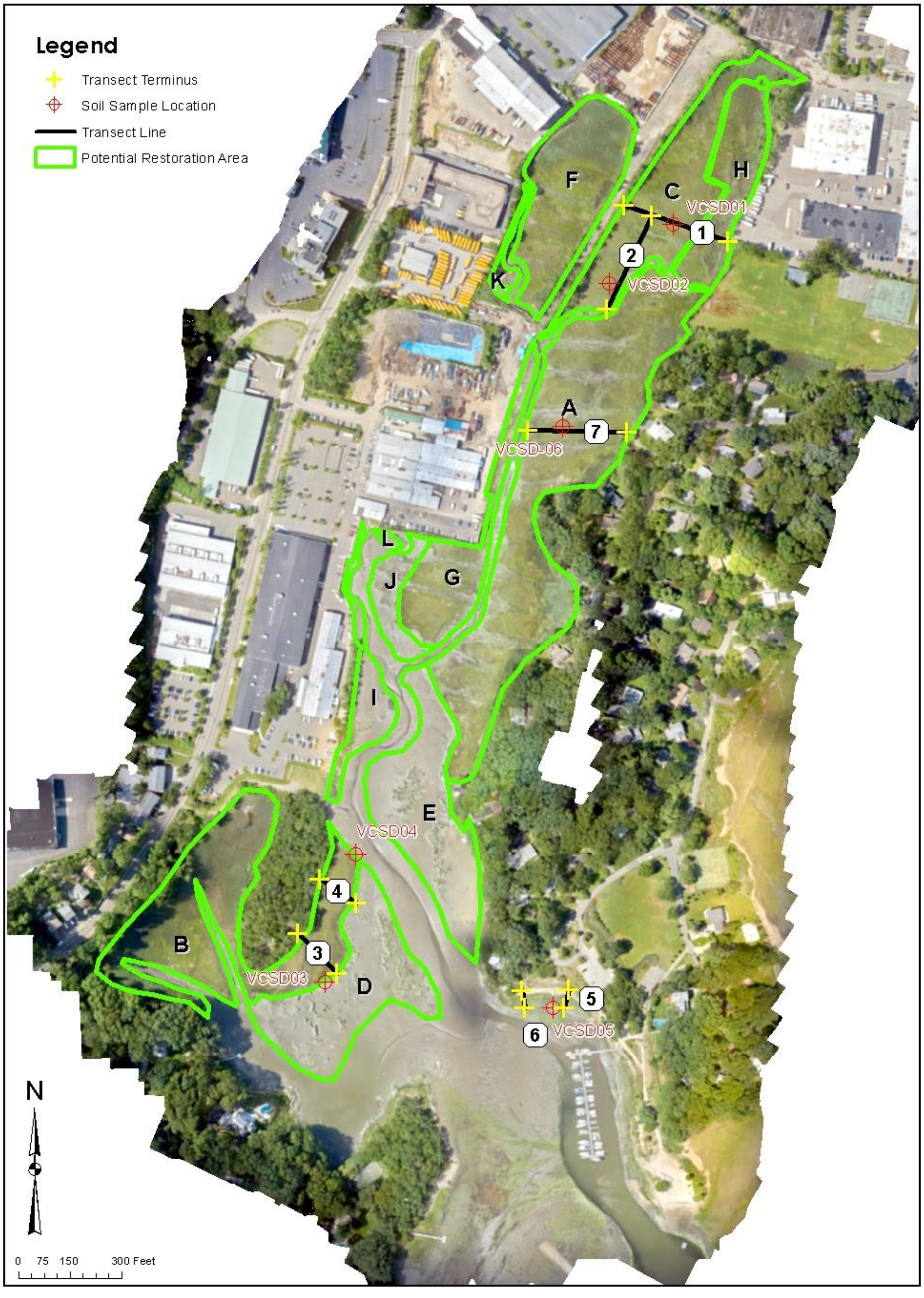

Figure 7. Targeted Restoration Areas and Vegetative Community Field Assessment Transect Locations

Transect lines were walked in a straight line from beginning to end. Data points were recorded with the sub meter GPS approximately every 30 feet or when a change in dominant vegetative community was observed. Vegetative coverages were identified by percent coverage and coded as shown in *Table 2*.

Table 2. Vegetation Inventory Codes and Representative Communities

Vegetation Code	Vegetative Community
Bare	Bare, vegetation dieback
Sa	*Spartina alterniflora*
SSa	Stunted *Spartina alterniflora*
Sp	*Spartina patens*
Ds	*Distichlis spicata*
If	*Iva frutescens*
Pa	*Phragmites australis*

Elevations associated with each of the vegetation point locations were used to develop elevation ranges for the respective dominant vegetative species, as depicted in *Figure 8* below. *Figure 8* illustrates that *Spartina alterniflora* dominates a wide range of elevations (0.00 ft and 4.67 ft (NAVD88)) which is typical of this low salt marsh species. The median elevation of *S. alterniflora* is 3.58 ft, which is above the Mean High Water (MHW) elevation but below the Mean Highest High Water (MHHW) elevation (*Figure 9*). At the upper limits of the elevation range (3.27 ft to 4.67 ft), *S. alterniflora* becomes stunted.

Photo 1. Typical *S. alterniflora* Low Marsh and adjacent unvegetated intertidal bank

Stunted *S. alterniflora* becomes interspersed with *Spartina patens* and *Disticlis spicata*. *S. patens* and *D. spicata* are considered high marsh species and occupy an elevation range between 3.67 ft and 4.42 ft.[4] Anecdotally, much of the high marsh vegetation is not densely vegetated. Rather, considerable areas of bare soil were observed in many locations where stunted *S. alterniflora*, *S. patens* and *D. spicata* were documented as the principal species. The median elevation of *D. spicata* and *S. patens* are 3.80 ft and 3.87 ft, respectively. Given MHHW is 3.69 ft these elevations are consistent with the existing tidal regime that support these high marsh species. However, the interspersion of bare soil and stunted *S. alterniflora* with these high marsh species is indicative of environmental effects that are currently not allowing *S. patens* and *D. spicata* to successfully out-compete *S. alterniflora* or overcome tide-related conditions (e.g., flooding frequency, salinity).

Photo 2. High Marsh with stunted *S. alternifora* (left) and *S. patens/D. spicata* (right) interspersed with active *Uca* sp. burrows

[4] Black grass (*Juncus gerardii*) is also considered a high marsh species. Although not observed in the transects established at Village Creek, *J. gerardii* was observed in several small stands throughout the salt marsh ecosystem.

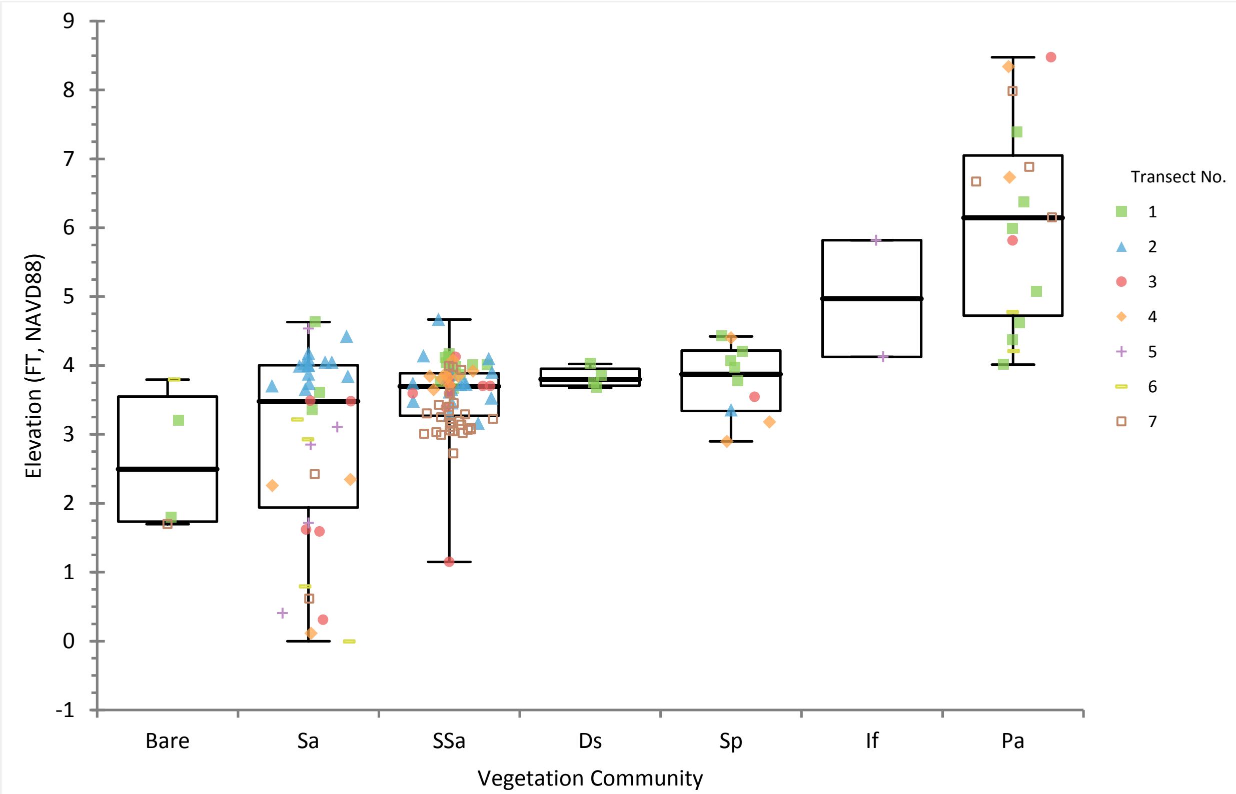

Figure 8. Elevation Ranges of Vegetative Species within All Restoration Project Areas

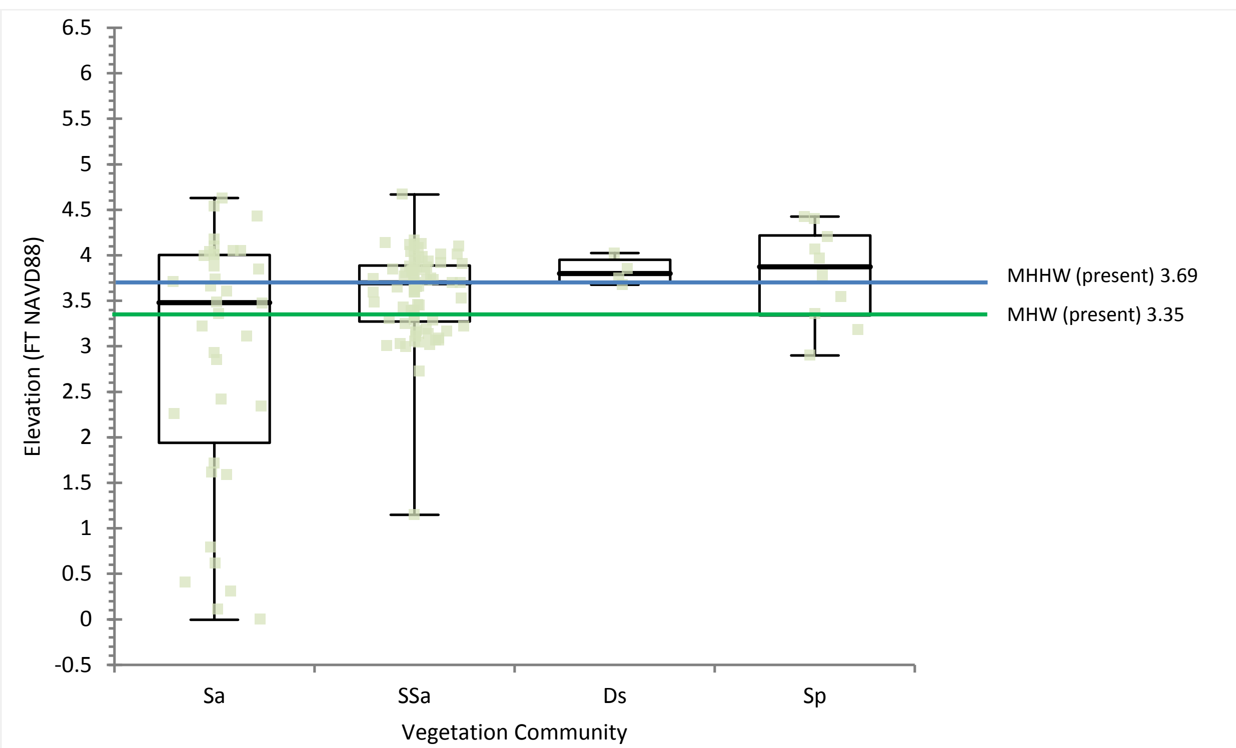

Figure 9. Elevation Ranges of High Marsh & Low Marsh Vegetative Species and Upper Tidal Data within All Restoration Project Areas

In order to maximize future succession and establishment of high marsh plant communities and thereby increase future resiliency of this salt marsh due to sea level rise, it is recommended that the restoration approach should, at the very least target, the high end of the elevation ranges inhabited by desired vegetative species:

- Elev. 3.95 – 4.42 ft NAVD88 for *S. patens* and *D. spicata*
- Elev. 4.5 – 5.85 ft NAVD88 for *I. frutescens*.

Although the proposed restoration project aims to increase the elevation of much of the marsh platform through the placement of sediment to targeted elevations, it is important to consider tidally-connected channels and pools and their importance as marine fisheries habitat. These areas will be left undisturbed and unfilled, and will continue to function as potential Essential Fish Habitat (EFH) for a number of marine and estuarine species that utilize the Village Creek salt marsh ecosystem.

2.4 Salt Marsh Soil Assessment

In addition to assessing the restoration area's salt marsh elevations and plant communities, six soil cores were collected to evaluate soil strata. The six soil cores were collected near transects used for the vegetation survey. Each core was measured and characterized by soil texture and color. Each representative soil cores (designated VCSD01 through VCSD-06) were vertically composited and transmitted for physical and chemical laboratory analyses.

2.4.1 Physical Characteristics and Analysis

In each core, the upper organic soil layer can be clearly distinguished from the reduced (gleyed) mineral sandy layer of the core. A summary of measurements and classifications for each of the soil layers observed at the cores is presented in *Table 3*below. It was observed during the soil sampling process that the integrity of the peat has been significantly reduced.

Table 3. Summary of Observed Soil Core Strata

VCSD01		VCSD02	
0" – 10"	Organic/Peat (Oa/e)	0" – 9"	Organic/Peat (Oa/e)
12" – 48"	Silty Sand (10y3/1)	9" – 36"	Silty Sand (N4/1)
VCSD03		**VCSD04**	
0" – 8"	Organic/Peat (Oa/e)	0" – 8"	Organic/Peat (Oa/e)
12" – 36"	Silty Fine Sand (2.5Y 5/2)	8" – 36"	Silty Fine Sand (2.5Y 5/1)
VCSD05		**VCSD06**	
0" – 10"	Organic/Peat (Oa/e)	0" – 6"	Organic/Peat (Oa/e)
10" – 48"	Silty Fine Sand (5Y 5/1)	6" – 48"	Silty Fine Sand (2.5Y 5/3)

Note: Depths indicated are distances below ground surface at core location.

A summary of physical laboratory analytical test results is provided in *Table 4* below; the complete analytical laboratory test report is provided as *Attachment B*.

Table 4. Summary of Physical Soil Analytical Test Results

Sample Name	% Sand	% Fines (Silt & Clay)
VCSD01	72%	28%
VCSD02	80%	20%
VCSD03	68%	34%
VCSD04	40%	60%
VCSD05	43%	57%
VCSD06	46%	54%

During the soil sampling process it was observed that the integrity of the peat has been noticeably reduced. Specifically, the upper 2 -3 inches of the peat layer consisted of a dense root mat. However, immediately below that upper few inches, the peat was not cohesive and had many small to medium voids. Anecdotally, walking on the marsh surface gave the impression that peat surface was tenuously firm, with the underlying peat structurally less stable. The exact cause and nature of this condition was not explored, However, future assessment of the marsh for TLD should consider this existing condition.

The soil data was assessed to estimate the amount of compaction that will occur as a result of placing dredged soil over the existing marsh surface. The thickness of the peat layer through the vegetated marshes along Village Creek and underlying sandy material is likely to provide a stable base upon which additional material may be placed. This assessment evaluated the potential compaction due to both consolidation of the existing marsh due to the weight of placed dredge material and construction equipment operations over the marsh. Consideration was not given to the structural integrity of the peat as discussed above. This would require a directed bulk density and compaction test, which was not planned for this preliminary assessment.

Based on strata (peat and mineral) thicknesses it is estimated that the potential compaction will be less than 1/2 inch from sediment placement depths of 6 inches or less, and up to approximately 1 ½ inches of compaction for sediment placements depths equal to 12 inches. There is also the potential for compaction from the proposed low-ground pressure construction equipment operations to be transient and minimal with no long-term compaction as a result from construction machinery. More detailed compaction analysis may be conducted through bulk density analysis of the areas most likely to be pursued for actual TLD work.

2.4.2 Chemical Characteristics and Analysis

Soil samples were collected and submitted for analysis of chemical constituents including metals, polycyclic aromatic hydrocarbons (PAHs), Polycyclic biphenyls (PCBs) and Extractable Petroleum Hydrocarbons (ETPH). Results were compared to upland disposal standards. Results were also compared to concentrations of test parameter for the proposed dredge area. This latter comparison allows for the evaluation of whether the dredge spoils would be a viable source of material for potential TLD while meeting anti-degredation requirements of CT DEEP. Repositioning of material from Harbor to salt marsh must be consistent with CT

DEEP beneficial reuse and anti-degradation policies, and would need approval from DEEP Remediation Division.

Table 5 summarizes the sediment/oil analytical data. A review of the data indicated that there are elevated concentrations of metals in the salt marsh soils. These elevated concentrations were observed in the northern Restoration Area (VCSD01, VCSD02, and VCSD06). These elevated concentrations were consistent with samples collected for dredging of the Harbor and channel. Low levels of PAHs in Harbor samples were reported at concentrations consistent with urban runoff.

While concentrations of pollutants in Harbor sample were consistent with the northern Restoration Areas, concentrations of parameters at the Norwalk Land Trust (VCSD03, VCSD04) and the Village Creek Harbor shoreline (VCSD05) were consistently lower.

3 Restoration Design and Implementation Considerations

There are numerous considerations when creating a salt marsh restoration plan. The considerations include current and target marsh vegetation communities' requirements, existing soils and potential compaction, existing tidal data, future sea level rise, and the restoration construction methodology. In addition, salt marsh restoration must also consider regulatory constraints and stakeholder concerns (e.g., residential and commercial community impacts). These various considerations need to be balanced in order to develop a restoration target elevation that will provide for establishment of the desired marsh vegetation while allowing for future sea level changes and adaptive management techniques.

3.1 Assessment of Tidal Data and Sea Level Rise

Tidal benchmarks were identified for Village Creek and the salt marsh based on NOAA tidal data station in South Norwalk (Station ID 8468448) and were provided in Table 1.

Fuss & O'Neill has also evaluated the projected rates of global sea level rise and updated them for the local area based on the documented eustatic changes that are occurring in New England to develop an expected range of sea level rise. This evaluation was based on data available from NOAA's Seal Level Rise Viewer[5] and calculated by NOAA Office of Coastal Management[6]. The results of sea level rise estimates by the years 2040 and 2060 are provided in *Table 6* below. The table presents estimates for an intermediate-low, intermediate, and high projection, resulting in a range of total water level increases expected for the Village Creek area.

[5] NOAA. 2017. Sea Level Rise Viewer. Available at: https://coast.noaa.gov/digitalcoast/tools/slr

[6] NOAA. 2017. "Global and regional sea level rise scenarios for the United States." NOAA Technical Report NOS CO-OPS 083

FUSS & O'NEILL

Table 5. Summary of Sediment Sampling Results

Village Creek Tidal Marsh, Norwalk, CT

July 2017

			Upper Village Creek Tidal Marsh			Norwalk Land Trust (250 Wilson Ave)		Village Creek Harbor (Yacht Basin)	Outer Marina	Inner Channel	Outer Channel	Inner Marina	
	ResDEC	**IC DEC**	**VCSD-01**	**VCSD-02**	**VCSD-06**	**VCSD-03**	**VCSD-04**	**VCSD-05**	**DR-S1S2S4**	**DR-S5S6S7S8**	**DR-S9S10S11**	**DR-S3**	**Average**
			699063017-01	699063017-02	699063017-06	699063017-03	699063017-04	699063017-05	Comp-5988	Comp-5989	Comp-5990	Comp-5991	
Miscellaneous Parameters													
pH	NE	NE	6.79	6.93	6.90	7.05	6.88	7.70					
Total Organic Carbon (mg/kg)	3.00	NE	29,000.00	48,000.00	51,000.00	44,000.00	46,000.00	15000.00	45,100.00	33,300.00	32,000.00	15,300.00	
Particle Size Description	NE	NE	Fine Sanday	Fine Sandy	Fine Sandy	Fine Sandy	Fine Sandy	Fine Sandy	Silt	Silt	Silt	Silt	
Metals (mg/kg)													
Silver	340	10,000	ND	2.0	ND	ND	ND	ND	NA	NA	NA	NA	
Arsenic	10	10	**11.0**	**20.1**	**8.3**	5.5	9.2	1.99	**10.8**	**10.1**	**11.5**	8.5	10.2
Barium	4,700	140,000	67.9	68.7	46.9	44.8	69.0	22.4	NA	NA	NA	NA	
Cadmium	34	1,000	ND	7.7	ND	ND	ND	ND	0.36	ND	ND	ND	0.4
Chromium	100	100	95.8	**141.0**	**53.5**	41.2	67.5	17.5	49.3	46.0	49.3	46.2	47.7
Copper	2,500	76,000	NA	NA	NA	NA	NA	NA	113.0	94.9	108.0	83.6	99.9
Mercury	20	610	0.43	0.81	0.43	ND	ND	ND	0.27	0.19	0.19	0.24	0.2
Nickle	1,400	7,500	NA	NA	NA	NA	NA	NA	26.4	24.1	23.8	19.9	23.6
Lead	400	1,000	177	271	1160	24.1	71.4	12.5	48.3	35.8	35.9	26.8	36.7
Selenium	340	10,000	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	
Zinc	20,000	61,000	NA	NA	NA	NA	NA	NA	134	111	114	111	117.5
Semivolatile Organic Compounds (ug/kg)													
Acenaphthene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	10	ND	9	ND	9.5
Anthracene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	38	26	31	17	28
Benz(a)anthracene	1,000	7,800	ND	ND	ND	ND	ND	ND	118	85	93	57	88
Benzo(a)pyrene	1,000	1,000	ND	ND	ND	ND	ND	ND	146	100	105	72	106
Benzo(b)fluoranthene	1,000	7,800	ND	ND	ND	ND	ND	ND	226	152	151	109	160
Benzo(g,h,i)perylene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	135	102	82	53	93
Benzo(k)fluoranthene	8,400	78,000	ND	ND	ND	ND	ND	ND	97	50	77	44	67
Chrysene	8,400	78,000	ND	ND	ND	ND	ND	ND	208	137	1630	94	517
Dibenz(a,h)anthracene	1,000	1,000	ND	ND	ND	ND	ND	ND	20	ND	13	ND	17
Fluoranthene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	389	251	282	170	273
Fluorene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	16	12	17	7	13
Indeno(1,2,3-cd)pyrene	1,000	7,800	ND	ND	ND	ND	ND	ND	110	76	88	45	80
Phenanthrene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	126	93	105	44	92
Pyrene	1,000,000	2,500,000	ND	ND	ND	ND	ND	ND	347	233	259	166	251
CT ETPH (mg/kg)	500	2,500	ND	190	ND	ND	ND	ND	NA	NA	NA	NA	
Polychlorinated Biphenyls (ug/kg)	1,000	10,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Notes:

NE = No Established criteria

NA = Not Analyzed

ND = Not Detected

Bolded values exceed ResDEC

Bolded and highlighted values exceed ResDEC and IC DEC

Table 6. Sea Level Rise Projections for Village Creek[7]

Year	Intermediate-Low Projection (total SLR in feet)	Intermediate Projection (total SLR in feet)	High Projection (total SLR in feet)
2020	0.39	0.59	0.95
2040	0.79	1.25	2.20
2060	1.18	2.03	3.97

Given the uncertainties inherent in projecting future sea levels, for the purposes of this project, the most appropriate projection and out-year would be the total increase in sea level rise by 2040 for the intermediate scenario. This projects an increase of 1.25 ft by the year 2040 (model start year of 2000). Based on this and the planned elevation increases discussed below, it is expected that the restoration project will succeed in meeting the design goals with little probability for adaptive management measures within the intervening period.

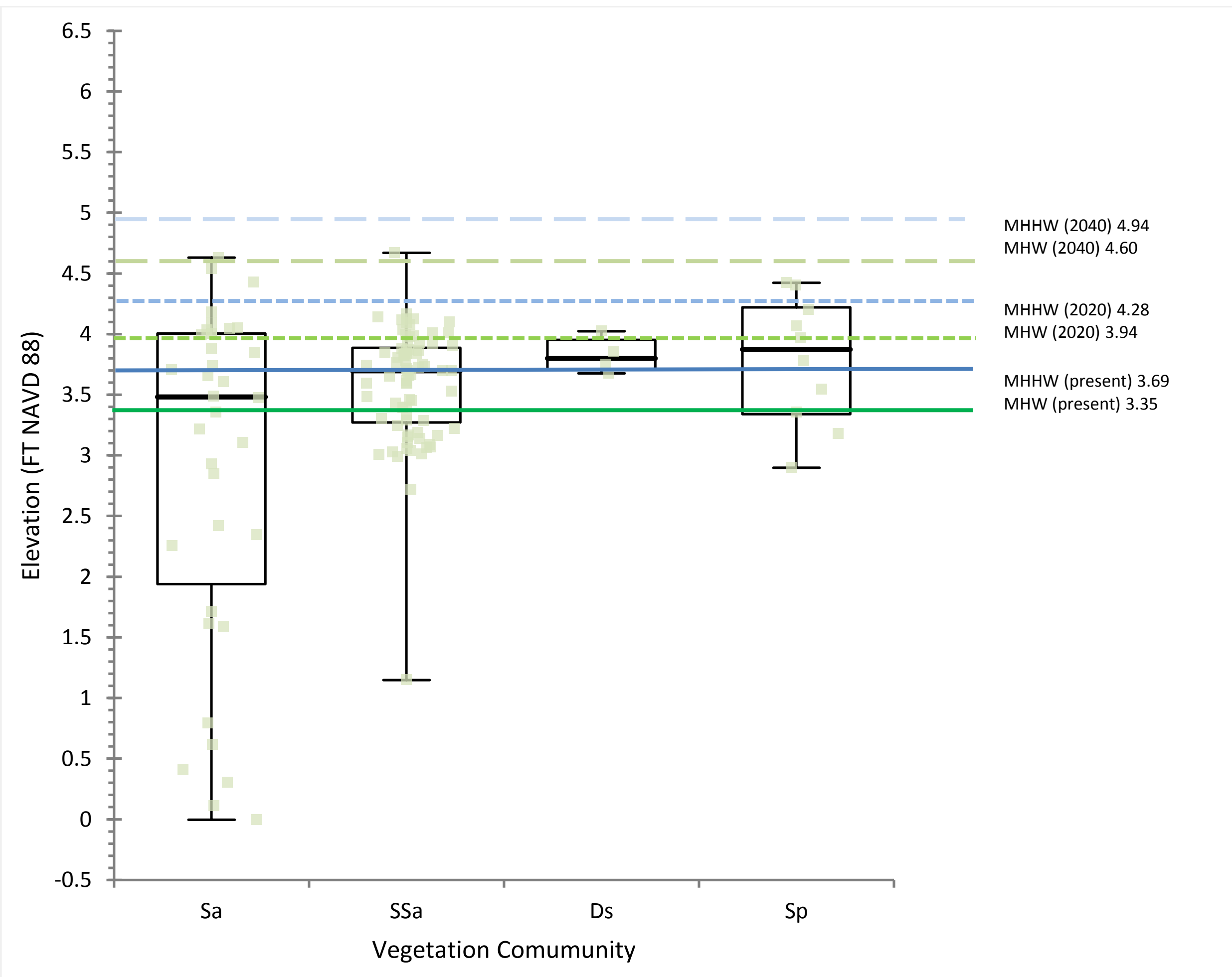

Figure 10. Elevation Ranges of High Marsh & Low Marsh Vegetative Species and Upper Tidal Data for Present and Predicted Sea Levels

[7] Elevations were calculated for the Bridgport tidal station

Figure 10 illustrates the present, 2020 and 2040 sea level rise elevations relative to present vegetation community distributions. By 2040, proposed areas filled to the highest elevations (5.85 ft NAVD88), which are currently suitable for only *I. frutescens*, will become ideal habitat for high marsh grasses, such as *S. patens*, *D. spicata and J. gerardii*. Additionally, the proposed restoration plan will allow the continuance of a predominately salt marsh community in the interim; constructing higher target elevations might provide additional high marsh area well into the future, but it would remove the project area entirely from a marsh community in the interim. The proposed plan successfully balances the elevation requirements of the marsh vegetation to current conditions with those of increased resiliency for the future.

With the knowledge of the elevation ranges that plant species are currently utilizing, the project restoration approach is to identify target elevations that will favor desired salt marsh species now as well as in the future as the sea level rise continues. By targeting the high end of the growing range of these species, and sloping the placed dredge material down to tie into the lower elevations near the existing channels and pools, additional habitat for low marsh species (*S. alterniflora*) and high marsh species (*S. patens, D. spicata,* and *Juncus gerardii*) is provided today, while also creating pockets with higher elevations that will provide areas for the marsh to transition to in the future.

3.2 Thin Layer Deposition Methodology Considerations

Additional considerations for the restoration approach include potential construction impacts and drainage conditions for the final topography established within the targeted restoration areas. Construction impacts may include compaction of the marsh sediment, vegetation disturbance, or permanent impacts to the tidal channels. Based on the sediment core characterization and bulk density results discussed above, compaction caused by the placement of a thin layer of sediment or the use of small low-ground pressure equipment (e.g., skid-steer bobcat loaders) will be minimal.

While compaction may be caused by large stockpiles of sediment temporarily placed on the marsh when discharged from dredging and allowed to dewater, these areas will experience accelerated compaction that would otherwise result from placement of the thin sand layer over a longer period of time and will likely experience some degree of rebound soon after the stockpile is removed when all material is distributed over target areas within the marsh. In addition, while compaction of the fill material itself is also a factor, based on the composition and grain size of the material to be dredged and previous experience with dredged material from the Village Creek Harbor and channel, it is expected that compaction of placed material will not be a concern as the dredged material is understood to be fine sand and silt. As project design and construction methodologies become more apparent, additional consideration will be given to the placement methodology, target elevations, potential placement and consolidation after construction and/or the likelihood of suspension and migration of placed material.

Vegetation will be disturbed in a variety of ways during this project. First, the project involves active burying of marsh vegetation due to the placement of thin layers of sand across the marsh, however most marsh species can recover completely within one or two growing seasons if the added layer of sediment is less than approximately 12 to 16 inches thick. Second, the main point of construction access and placement of dredge pipes may impact upland vegetation along the marsh. Disturbance of the upland vegetation during construction should be minimal because the vegetation in these areas dominated by scrub shrub species and will naturally recover.

Finally, in order to for transport and placement equipment to access parts of the marsh, a temporary crossing will need to be constructed by filling one or more of the tidal channels with sand. This will have little impact on the marsh or on fisheries since work will be completed within specified time of year restrictions, and upon completion of the sediment grading activities and the removal of the equipment from that area of the marsh, these channels with be promptly restored to pre-construction conditions.

Finally, careful consideration must be given to the resulting drainage patterns at the site. Incorrectly grading the sediment could result in ponding in isolated low areas, while large even surfaces could be impacted by significant sheet flow, and the associated erosion such flow could cause to the newly placed material, particularly prior to the re-establishment of vegetation. While the newly created marsh will establish its own channels, consideration should be given to creating several small channels within each restored area to minimize sheet flow and ponding. These small channels can be created with a "ditch witch" or other small excavating machine that can create a small channel/ditch that connects the tidal creeks across the lower areas to the higher elevations within the restored areas.

3.3 Targeted Restoration Area Elevations and Volumes

As noted above, through review of field conditions, aerial photogrammetry, elevation mapping and vegetative data, several targeted sub-areas were identified for restoration within the salt marsh project area. The primary driver for this decision of placement area is sediment and soil quality. Therefore, Restoration Areas A, C, F, G, H & K (see *Figure 6*), were selected based on the similarity between pollutants in marsh soil and in dredge sediment. Other factors that make these Restoration Areas preferable are level of habitat degradation (i.e. areas of stressed vegetation, areas of shallow impounded water, bare sections, etc.), accessibility, and the size of the areas with enough contiguous area that would make restoration activities more feasible and economical.

As noted above, the upper ends of the elevation ranges inhabited by various high marsh species are 3.95 to 4.42 ft NAVD88 for *S. patens* and *D. spicata*, with a median elevation of 3.80 and 3.87 ft NAVD88, respectively. The upper ends of the elevation ranges inhabited by *Iva frutescens* is 4.5 to 5.85 ft NAVD88 with a median elevation of 4.97 (*Figure 7)*. By targeting 4.97 ft NAVD88 as a maximum fill elevation and grading the elevations down to approximately 4.5 ft NAVD88 near the existing tidal channels, the resulting marsh platform elevations will provide increased resiliency for this system into the future.

To estimate the volume of material necessary to implement this restoration approach, each restoration area was conceptually graded to the target elevation of 4.97 ft NAVD88. A depiction of the restoration areas with the fill volumes required to achieve the target elevation is provided in *Figure 10* below. The volumes displayed in each of the Restoration Areas in *Figure 10* provides estimated fill volumes required to achieve the targeted elevation in each of the six restoration areas, prior to adjustments for compaction.

To account for the minor compaction that will likely occur during and following placement of dredged material, the overall estimate for the total volume of sediment necessary to complete the project was adjusted based on the previous estimate of between 0.5 and 1.5 inches of compaction likely where is 6 - 12 inches of material is to be placed on the marsh. While most areas will receive a layer approximately 6 inches thick or slightly less, to be conservative an additional inch of material was added to the volume for much of the restoration area. This adjustment brings the targeted elevations for construction up to 5.09 ft NAVD88, rather than the previously stated of 4.97 ft NAVD88.

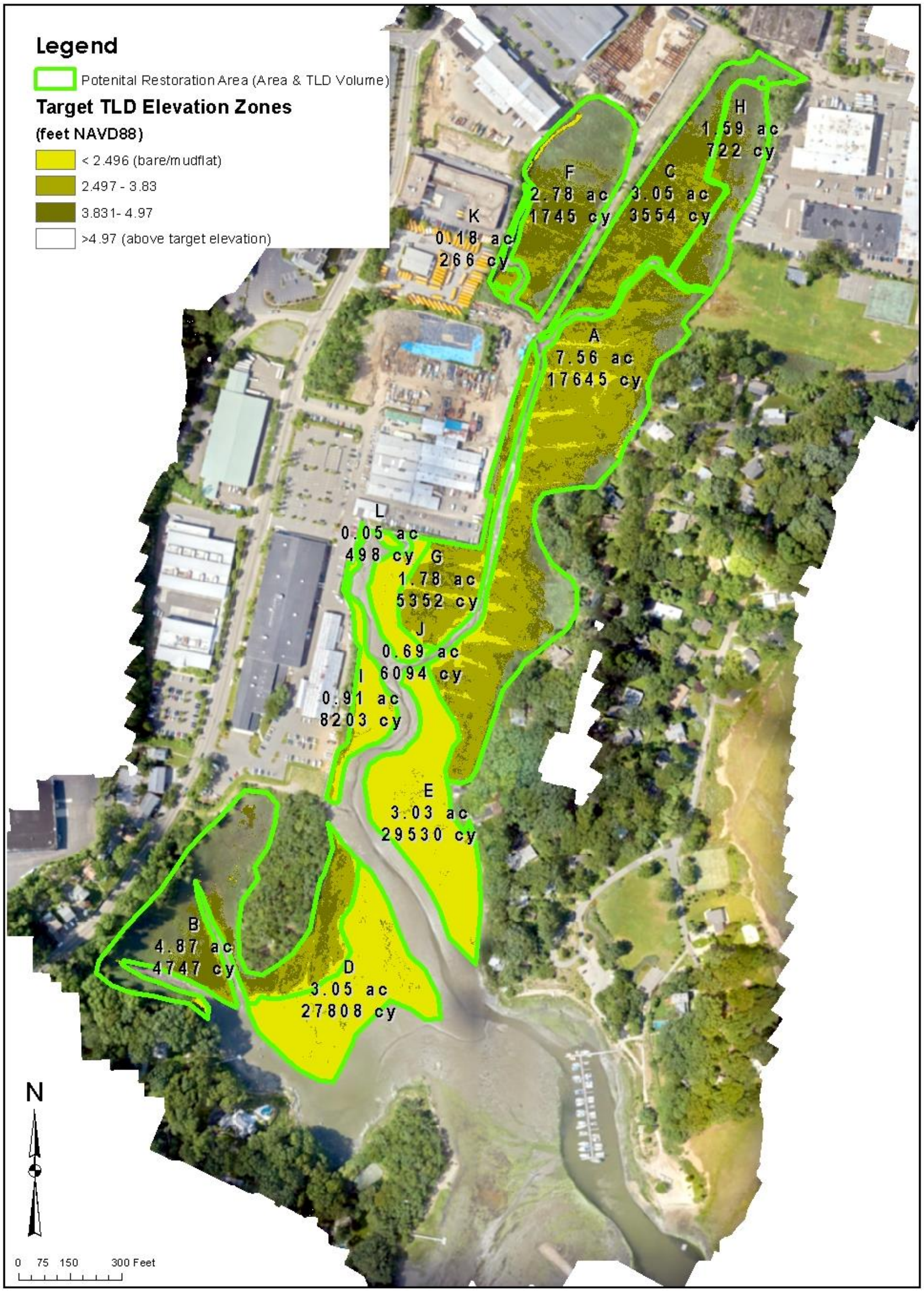

Figure 11. Target TLD Placement Zones and Volumes in Restoration Areas

3.4 Vegetative Restoration

After the addition and grading of the fill is complete, live plantings should be planned to promote revegetation of portions of targeted TLD areas. In addition to these plantings, it is expected that different practices including seeding, additional plantings, or no plantings or seeding may be employed in different areas such that observations can be made of actual revegetation rates and coverage in each of these areas and decisions can then be supported to conduct additional supplemental planting or seeding in subsequent growing seasons to further promote establishment of vegetation over disturbed areas, if natural succession is not occurring satisfactorily. This adaptive approach would be an element of the project's overall plan for implementation. Areas for respective restoration practices will be depicted on the design drawings, along with a description of planned approaches for monitoring and assessments to determine what supplemental plantings/seeding may be appropriate, and where, following TLD activities.

Although what plant species dominate in the short term will largely be the result of what species are directly planted or seeded in each area, based on the target elevations, certain vegetation classes could be expected to thrive in different zones. However, the dominant species in each elevation zone will likely shift over time as sea level continues to rise and higher elevations begin to experience more frequent tidal inundation.

In the short term, it is expected that a mix of high marsh species, such as *S. patens, D. spicata*, and *J. gerardii* will recolonize the majority of the filled areas. The central portions of each restoration area, with a target elevation for the marsh planform at 4.97 ft NAVD88 may be dominated by *I. frutescens* and other upland-transitional species in the short term given that this elevation is at the elevation range limit currently inhabited by most marsh grasses.

In the long-term, it is expected that vegetation assemblages shift to higher elevations. Low marsh species, such as *S. alterniflora*, will begin to colonize higher reaches of the graded fill area, while high marsh species will eventually dominate the highest portions of the filled restoration areas. Therefore, utilizing graded elevations rather than a single level marsh platform, we improve the ability of respective marsh vegetative communities to persist over time, with added resiliency for sea level rise and climate change.

3.5 Adaptive Management

This project is incorporating the principles of ecological engineering (self-design) in that the restoration plan will largely allow nature to design the channels and ultimately the marsh vegetation that will occur. While limited planting of marsh species will occur, the majority of the restoration area will rely on natural recruitment for the re-establishment of vegetation. Additionally, while small drainage channels may be established in the newly restored areas, the final drainage patterns and channel formation will be allowed to form naturally.

Due to the uncertainties of ecological engineering, it is necessary to establish an adaptive management program that monitors the project to ensure that it is progressing towards the established restoration goals. The project has developed a data collection effort and a monitoring team that will function as the Adaptive Management Team (AMT). While development of an adaptive management plan is beyond the current scope of this project assignment, it is understood that the AMT has established data collection transects in both a reference marsh and the project area. Additionally, the AMT has established that periodic site visits will be conducted to monitor drainage patterns and evaluate establishment of marsh vegetation. This effort will help ensure that the marsh restoration will progress as projected, as the findings of these monitoring efforts will guide the future management decisions of the Adaptive Management Team.

It is recommended that separate personnel/teams be assigned to respective responsibilities for 1) site monitoring and data acquisition, and 2) assessment of data with regard to restoration goals and implementing decisions for future monitoring and restoration practices within the adaptive management plan's established framework. Division of these roles will promote and support the integrity of management decision through adherence to the project's originally established restoration goals.

Attachment A

Sediment/Soil Sample Analytical Laboratory Results

PHOENIX
Environmental Laboratories, Inc.

Monday, July 17, 2017

Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Project ID: VILLAGE CREEK
Sample ID#s: BY52240 - BY52245

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 have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
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
VT Lab Registration #VT11301

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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	10:45
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52240

Project ID: VILLAGE CREEK
Client ID: 699063017-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 1.1	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Arsenic	11.0	2.3	mg/Kg	1	07/06/17	LK	SW6010C
Barium	67.9	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	< 1.1	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	95.8	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	0.43	0.10	mg/Kg	1	07/06/17	RS	SW7471B
Lead	177	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Selenium	< 4.5	4.5	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	28		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	6.79	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	29000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/06/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	180	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	87		%	1	07/06/17	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	590	ug/Kg	10	07/06/17	AW	SW8082A

Ver 1

Project ID: VILLAGE CREEK
Client ID: 699063017-01

Phoenix I.D.: BY52240

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	590	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	80		%	10	07/06/17	AW	30 - 150 %
% TCMX	98		%	10	07/06/17	AW	30 - 150 %

Semivolatiles

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,2,4,5-Tetrachlorobenzene	ND	280	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	380	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	470	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	370	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	1200	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	1200	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	550	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	390	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	2400	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	420	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	340	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	740	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	410	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	330	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	380	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	450	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	1200	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	830	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	290	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	69		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	62		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	53		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	60		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	63		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	66		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

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

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller

Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, Project Manager

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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	11:20
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52241

Project ID: VILLAGE CREEK
Client ID: 699063017-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	2.0	1.1	mg/Kg	1	07/06/17	MA	SW6010C
Arsenic	20.1	2.1	mg/Kg	1	07/06/17	LK	SW6010C
Barium	68.7	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	7.7	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	141	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	0.81	0.09	mg/Kg	1	07/06/17	RS	SW7471B
Lead	271	1.1	mg/Kg	1	07/06/17	LK	SW6010C
Selenium	< 4.2	4.2	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	29		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	6.93	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	48000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/06/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	190	170	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	**		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	86		%	1	07/06/17	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	570	ug/Kg	10	07/06/17	AW	SW8082A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	570	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	63		%	10	07/06/17	AW	30 - 150 %
% TCMX	81		%	10	07/06/17	AW	30 - 150 %

Semivolatiles

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,2,4,5-Tetrachlorobenzene	ND	270	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	360	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	440	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	350	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	1100	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	530	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	1100	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	520	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	370	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D

Project ID: VILLAGE CREEK
Client ID: 699063017-02

Phoenix I.D.: BY52241

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	2200	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	420	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	330	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	410	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	740	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	390	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	320	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	360	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	1100	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	780	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	280	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	69		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	61		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	54		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	61		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	63		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	63		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

TPH Comment:
**Petroleum hydrocarbon chromatogram contains a multicomponent hydrocarbon distribution in the range of C9 to C36. The sample was quantitated against a C9-C36 alkane hydrocarbon standard.

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

If there are any questions regarding this data, please call Phoenix Client Services.
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Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, 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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	12:15
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52242

Project ID: VILLAGE CREEK
Client ID: 699063017-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 1.0	1.0	mg/Kg	1	07/06/17	LK	SW6010C
Arsenic	5.5	2.0	mg/Kg	1	07/06/17	LK	SW6010C
Barium	44.8	1.0	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	< 1.0	1.0	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	41.2	1.0	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	< 0.07	0.07	mg/Kg	1	07/06/17	RS	SW7471B
Lead	24.1	1.0	mg/Kg	1	07/06/17	LK	SW6010C
Selenium	< 4.0	4.0	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	33		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	7.05	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	44000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/06/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM

TPH by GC (Extractable Products)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ext. Petroleum H.C. (C9-C36)	ND	150	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	100		%	1	07/06/17	JRB	50 - 150 %

Polychlorinated Biphenyls

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1016	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	990	ug/Kg	10	07/06/17	AW	SW8082A

Project ID: VILLAGE CREEK
Client ID: 699063017-03

Phoenix I.D.: BY52242

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	990	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	73		%	10	07/06/17	AW	30 - 150 %
% TCMX	86		%	10	07/06/17	AW	30 - 150 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	320	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	390	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	310	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	470	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	460	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	330	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D

Project ID: VILLAGE CREEK
Client ID: 699063017-03

Phoenix I.D.: BY52242

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	2000	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	420	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	290	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	360	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	350	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	280	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	320	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	380	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	250	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	65		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	56		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	61		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	60		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	68		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	76		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

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

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, Project Manager

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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	12:50
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52243

Project ID: VILLAGE CREEK
Client ID: 699063017-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 1.8	1.8	mg/Kg	1	07/06/17	LK	SW6010C
Arsenic	9.2	3.5	mg/Kg	1	07/06/17	LK	SW6010C
Barium	69.0	1.8	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	< 1.8	1.8	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	67.5	1.8	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	0.26	0.13	mg/Kg	1	07/06/17	RS	SW7471B
Lead	71.4	1.8	mg/Kg	1	07/06/17	LK	SW6010C
Selenium	< 7.0	7.0	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	18		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	6.88	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	46000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/06/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	270	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	100		%	1	07/06/17	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	910	ug/Kg	10	07/06/17	AW	SW8082A

Ver 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	910	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	64		%	10	07/06/17	AW	30 - 150 %
% TCMX	79		%	10	07/06/17	AW	30 - 150 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	440	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	580	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	710	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	570	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	1800	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	860	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	1800	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	840	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	610	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D

Project ID: VILLAGE CREEK
Client ID: 699063017-04

Phoenix I.D.: BY52243

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	3600	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	910	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	530	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	660	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	840	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	740	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	630	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	510	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	590	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	700	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	1800	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	1300	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	450	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	59		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	50		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	50		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	56		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	68		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

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

If there are any questions regarding this data, please call Phoenix Client Services.
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Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, Project Manager

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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	13:35
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52244

Project ID: VILLAGE CREEK
Client ID: 699063017-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.43	0.43	mg/Kg	1	07/06/17	LK	SW6010C
Arsenic	1.99	0.85	mg/Kg	1	07/06/17	LK	SW6010C
Barium	22.4	0.43	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	< 0.43	0.43	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	17.5	0.43	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	< 0.03	0.03	mg/Kg	1	07/07/17	RS	SW7471B
Lead	12.5	0.43	mg/Kg	1	07/06/17	LK	SW6010C
Selenium	< 1.7	1.7	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	77		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	7.70	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	15000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/07/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	63	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	110		%	1	07/06/17	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	430	ug/Kg	10	07/06/17	AW	SW8082A

Project ID: VILLAGE CREEK
Client ID: 699063017-05

Phoenix I.D.: BY52244

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	430	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	102		%	10	07/06/17	AW	30 - 150 %
% TCMX	109		%	10	07/06/17	AW	30 - 150 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	210	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	210	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	210	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D

Ver 1

Project ID: VILLAGE CREEK
Client ID: 699063017-05

Phoenix I.D.: BY52244

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	860	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	210	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	430	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	300	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	200	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	62		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	66		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	64		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	65		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	67		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	77		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

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

Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, Project Manager

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

July 17, 2017

FOR: Attn: Mr. Josh Wilson
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	BULK	Collected by:		06/30/17	14:10
Location Code:	F&O	Received by:	LB	07/05/17	17:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	20161030.A10				

Laboratory Data

SDG ID: GBY52240
Phoenix ID: BY52245

Project ID: VILLAGE CREEK
Client ID: 699063017-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 1.5	1.5	mg/Kg	1	07/06/17	LK	SW6010C
Arsenic	8.3	3.1	mg/Kg	1	07/06/17	LK	SW6010C
Barium	46.9	1.5	mg/Kg	1	07/06/17	LK	SW6010C
Cadmium	< 1.5	1.5	mg/Kg	1	07/06/17	LK	SW6010C
Chromium	53.5	1.5	mg/Kg	1	07/06/17	LK	SW6010C
Mercury	0.43	0.11	mg/Kg	1	07/07/17	RS	SW7471B
Lead	1160	15	mg/Kg	10	07/06/17	LK	SW6010C
Selenium	< 6.1	6.1	mg/Kg	1	07/06/17	LK	SW6010C
Percent Solid	23		%		07/05/17	q	SW846-%Solid
pH at 25C - Soil	6.90	1.00	pH Units	1	07/06/17 00:28	RWR	SW9045
Tot.Org.Carbon	51000	100	mg/kg	1	07/07/17	MA	SW9060A/L. Kahn
Soil Extraction for PCB	Completed				07/05/17	BC/V	SW3545A
Soil Extraction for SVOA	Completed				07/05/17	BC/CKV	SW3545A
Extraction of CT ETPH	Completed				07/05/17	BC/VCK	SW3545A
Mercury Digestion	Completed				07/07/17	W/W	SW7471B
Total Metals Digest	Completed				07/05/17	L/AG	SW3050B
Tot.Org.Carbon Preparation	Completed				07/05/17	MA	
Sieve Test	Completed				07/12/17	*	ASTM
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	220	mg/Kg	1	07/06/17	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	07/06/17	JRB	CTETPH 8015D
QA/QC Surrogates							
% n-Pentacosane	77		%	1	07/06/17	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1221	ND	720	ug/Kg	10	07/06/17	AW	SW8082A

Ver 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1232	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1242	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1248	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1254	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1260	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1262	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
PCB-1268	ND	720	ug/Kg	10	07/06/17	AW	SW8082A
QA/QC Surrogates							
% DCBP	71		%	10	07/06/17	AW	30 - 150 %
% TCMX	81		%	10	07/06/17	AW	30 - 150 %

Semivolatiles

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,2,4,5-Tetrachlorobenzene	ND	340	ug/Kg	1	07/06/17	DD	SW8270D
1,2,4-Trichlorobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Dichlorobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
1,2-Diphenylhydrazine	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
1,3-Dichlorobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
1,4-Dichlorobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2,4,5-Trichlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2,4,6-Trichlorophenol	ND	460	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dichlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dimethylphenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrophenol	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
2,4-Dinitrotoluene	ND	570	ug/Kg	1	07/06/17	DD	SW8270D
2,6-Dinitrotoluene	ND	450	ug/Kg	1	07/06/17	DD	SW8270D
2-Chloronaphthalene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2-Chlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylnaphthalene	ND	560	ug/Kg	1	07/06/17	DD	SW8270D
2-Methylphenol (o-cresol)	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitroaniline	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
2-Nitrophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	1400	ug/Kg	1	07/06/17	DD	SW8270D
3,3'-Dichlorobenzidine	ND	680	ug/Kg	1	07/06/17	DD	SW8270D
3-Nitroaniline	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
4,6-Dinitro-2-methylphenol	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
4-Bromophenyl phenyl ether	ND	1400	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloro-3-methylphenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
4-Chloroaniline	ND	670	ug/Kg	1	07/06/17	DD	SW8270D
4-Chlorophenyl phenyl ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitroaniline	ND	480	ug/Kg	1	07/06/17	DD	SW8270D
4-Nitrophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Acenaphthylene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Acetophenone	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Aniline	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
Anthracene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benz(a)anthracene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzidine	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(a)pyrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(b)fluoranthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(ghi)perylene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzo(k)fluoranthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Benzoic acid	ND	2900	ug/Kg	1	07/06/17	DD	SW8270D
Benzyl butyl phthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethoxy)methane	ND	420	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroethyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-chloroisopropyl)ether	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Bis(2-ethylhexyl)phthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Carbazole	ND	720	ug/Kg	1	07/06/17	DD	SW8270D
Chrysene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Dibenz(a,h)anthracene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Dibenzofuran	ND	420	ug/Kg	1	07/06/17	DD	SW8270D
Diethyl phthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Dimethylphthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-butylphthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Di-n-octylphthalate	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Fluoranthene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Fluorene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobenzene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorobutadiene	ND	520	ug/Kg	1	07/06/17	DD	SW8270D
Hexachlorocyclopentadiene	ND	840	ug/Kg	1	07/06/17	DD	SW8270D
Hexachloroethane	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Indeno(1,2,3-cd)pyrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Isophorone	ND	740	ug/Kg	1	07/06/17	DD	SW8270D
Naphthalene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Nitrobenzene	ND	500	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodimethylamine	ND	410	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodi-n-propylamine	ND	470	ug/Kg	1	07/06/17	DD	SW8270D
N-Nitrosodiphenylamine	ND	550	ug/Kg	1	07/06/17	DD	SW8270D
Pentachloronitrobenzene	ND	1400	ug/Kg	1	07/06/17	DD	SW8270D
Pentachlorophenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenanthrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Phenol	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Pyrene	ND	1000	ug/Kg	1	07/06/17	DD	SW8270D
Pyridine	ND	350	ug/Kg	1	07/06/17	DD	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	58		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorobiphenyl	53		%	1	07/06/17	DD	30 - 130 %
% 2-Fluorophenol	55		%	1	07/06/17	DD	30 - 130 %
% Nitrobenzene-d5	52		%	1	07/06/17	DD	30 - 130 %
% Phenol-d5	60		%	1	07/06/17	DD	30 - 130 %
% Terphenyl-d14	68		%	1	07/06/17	DD	30 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

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:

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.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

Semi-Volatile Comment:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria.

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

If there are any questions regarding this data, please call Phoenix Client Services.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
July 17, 2017
Reviewed and Released by: Ethan Lee, 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

July 17, 2017

QA/QC Data

SDG I.D.: GBY52240

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 392566 (mg/kg), QC Sample No: BY51905 (BY52240, BY52241, BY52242, BY52243)													
Mercury - Soil	BRL	0.03	<0.03	<0.03	NC	86.4	77.9	10.3	95.4			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 392512 (mg/kg), QC Sample No: BY52508 (BY52240, BY52241, BY52242, BY52243, BY52244, BY52245)													
ICP Metals - Soil													
Arsenic	BRL	0.67	1.50	1.30	NC	92.2			87.5			75 - 125	30
Barium	BRL	0.33	29.1	32.0	9.50	96.8			114			75 - 125	30
Cadmium	BRL	0.33	<0.31	<0.34	NC	92.9			91.6			75 - 125	30
Chromium	BRL	0.33	14.5	15.6	7.30	100			96.4			75 - 125	30
Lead	BRL	0.33	7.4	8.65	15.6	98.8			96.4			75 - 125	30
Selenium	BRL	1.3	<1.2	<1.3	NC	80.2			75.8			75 - 125	30
Silver	BRL	0.33	<0.31	<0.34	NC	96.9			96.3			75 - 125	30
QA/QC Batch 392725 (mg/kg), QC Sample No: BY52686 (BY52244, BY52245)													
Mercury - Soil	BRL	0.02	<0.03	<0.03	NC	87.6	90.3	3.0	102			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%.													

Environmental Laboratories, Inc.
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QA/QC Report

July 17, 2017

QA/QC Data

SDG I.D.: GBY52240

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 392854 (mg/kg), QC Sample No: BY52240 (BY52240, BY52241, BY52242, BY52243, BY52244, BY52245)													
Tot.Org.Carbon	BRL	100	29000	30000	NC	99.7						75 - 125	30

Comment:

This batch does not include an MS due to high sample concentration.

Additional criteria matrix spike acceptance range is 75-125%.

PHOENIX
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

July 17, 2017

QA/QC Data

SDG I.D.: GBY52240

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 392490 (mg/Kg), QC Sample No: BY51695 (BY52240, BY52241, BY52242, BY52243, BY52244, BY52245)											
TPH by GC (Extractable Products) - Bulk											
Ext. Petroleum H.C. (C9-C36)	ND	50	97	79	20.5	91	92	1.1	60 - 120	30	
% n-Pentacosane	78	%	79	78	1.3	84	80	4.9	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.

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 392461 (ug/kg), QC Sample No: BY51906 (BY52240, BY52241, BY52242, BY52243, BY52244, BY52245)											
Semivolatiles - Bulk											
1,2,4,5-Tetrachlorobenzene	ND	230	64	65	1.6	65	66	1.5	30 - 130	30	
1,2,4-Trichlorobenzene	ND	230	64	66	3.1	65	66	1.5	30 - 130	30	
1,2-Dichlorobenzene	ND	180	56	58	3.5	59	56	5.2	30 - 130	30	
1,2-Diphenylhydrazine	ND	230	73	75	2.7	68	64	6.1	30 - 130	30	
1,3-Dichlorobenzene	ND	230	54	55	1.8	56	55	1.8	30 - 130	30	
1,4-Dichlorobenzene	ND	230	54	56	3.6	56	55	1.8	30 - 130	30	
2,4,5-Trichlorophenol	ND	230	76	75	1.3	74	74	0.0	30 - 130	30	
2,4,6-Trichlorophenol	ND	130	70	75	6.9	73	72	1.4	30 - 130	30	
2,4-Dichlorophenol	ND	130	72	73	1.4	72	69	4.3	30 - 130	30	
2,4-Dimethylphenol	ND	230	68	69	1.5	70	71	1.4	30 - 130	30	
2,4-Dinitrophenol	ND	230	30	29	3.4	52	43	18.9	30 - 130	30	l
2,4-Dinitrotoluene	ND	130	77	77	0.0	75	74	1.3	30 - 130	30	
2,6-Dinitrotoluene	ND	130	75	78	3.9	74	75	1.3	30 - 130	30	
2-Chloronaphthalene	ND	230	69	70	1.4	69	69	0.0	30 - 130	30	
2-Chlorophenol	ND	230	65	66	1.5	66	65	1.5	30 - 130	30	
2-Methylnaphthalene	ND	230	63	64	1.6	65	65	0.0	30 - 130	30	
2-Methylphenol (o-cresol)	ND	230	67	69	2.9	67	66	1.5	30 - 130	30	
2-Nitroaniline	ND	330	69	68	1.5	72	71	1.4	30 - 130	30	
2-Nitrophenol	ND	230	63	65	3.1	66	67	1.5	30 - 130	30	
3&4-Methylphenol (m&p-cresol)	ND	230	72	73	1.4	73	71	2.8	30 - 130	30	
3,3'-Dichlorobenzidine	ND	130	62	63	1.6	63	61	3.2	30 - 130	30	
3-Nitroaniline	ND	330	69	68	1.5	70	73	4.2	30 - 130	30	
4,6-Dinitro-2-methylphenol	ND	230	58	57	1.7	68	63	7.6	30 - 130	30	
4-Bromophenyl phenyl ether	ND	230	76	76	0.0	74	71	4.1	30 - 130	30	
4-Chloro-3-methylphenol	ND	230	75	77	2.6	76	75	1.3	30 - 130	30	
4-Chloroaniline	ND	230	58	59	1.7	62	66	6.3	30 - 130	30	
4-Chlorophenyl phenyl ether	ND	230	72	74	2.7	71	72	1.4	30 - 130	30	
4-Nitroaniline	ND	230	76	77	1.3	73	75	2.7	30 - 130	30	
4-Nitrophenol	ND	230	72	73	1.4	72	71	1.4	30 - 130	30	
Acenaphthene	ND	230	74	75	1.3	73	73	0.0	30 - 130	30	
Acenaphthylene	ND	130	71	71	0.0	69	70	1.4	30 - 130	30	
Acetophenone	ND	230	60	62	3.3	61	61	0.0	30 - 130	30	
Aniline	ND	330	41	43	4.8	49	55	11.5	30 - 130	30	
Anthracene	ND	230	79	77	2.6	76	74	2.7	30 - 130	30	

QA/QC Data

SDG I.D.: GBY52240

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Benz(a)anthracene	ND	230	78	78	0.0	76	74	2.7	30 - 130	30	
Benzidine	ND	330	18	20	10.5	23	17	30.0	30 - 130	30	l,m
Benzo(a)pyrene	ND	130	76	76	0.0	72	74	2.7	30 - 130	30	
Benzo(b)fluoranthene	ND	160	82	79	3.7	76	79	3.9	30 - 130	30	
Benzo(ghi)perylene	ND	230	56	66	16.4	49	42	15.4	30 - 130	30	
Benzo(k)fluoranthene	ND	230	75	78	3.9	77	79	2.6	30 - 130	30	
Benzoic Acid	ND	330	<10	<10	NC	26	18	36.4	30 - 130	30	l,m,r
Benzyl butyl phthalate	ND	230	78	78	0.0	75	73	2.7	30 - 130	30	
Bis(2-chloroethoxy)methane	ND	230	73	73	0.0	71	71	0.0	30 - 130	30	
Bis(2-chloroethyl)ether	ND	130	63	63	0.0	60	53	12.4	30 - 130	30	
Bis(2-chloroisopropyl)ether	ND	230	54	56	3.6	55	54	1.8	30 - 130	30	
Bis(2-ethylhexyl)phthalate	ND	230	79	79	0.0	76	74	2.7	30 - 130	30	
Carbazole	ND	230	78	79	1.3	77	75	2.6	30 - 130	30	
Chrysene	ND	230	82	82	0.0	80	79	1.3	30 - 130	30	
Dibenz(a,h)anthracene	ND	130	65	75	14.3	59	51	14.5	30 - 130	30	
Dibenzofuran	ND	230	71	73	2.8	70	71	1.4	30 - 130	30	
Diethyl phthalate	ND	230	74	76	2.7	73	72	1.4	30 - 130	30	
Dimethylphthalate	ND	230	75	76	1.3	74	72	2.7	30 - 130	30	
Di-n-butylphthalate	ND	230	79	81	2.5	77	73	5.3	30 - 130	30	
Di-n-octylphthalate	ND	230	84	84	0.0	80	78	2.5	30 - 130	30	
Fluoranthene	ND	230	80	80	0.0	78	75	3.9	30 - 130	30	
Fluorene	ND	230	73	74	1.4	71	71	0.0	30 - 130	30	
Hexachlorobenzene	ND	130	76	77	1.3	73	73	0.0	30 - 130	30	
Hexachlorobutadiene	ND	230	63	64	1.6	64	64	0.0	30 - 130	30	
Hexachlorocyclopentadiene	ND	230	54	55	1.8	54	51	5.7	30 - 130	30	
Hexachloroethane	ND	130	54	56	3.6	56	56	0.0	30 - 130	30	
Indeno(1,2,3-cd)pyrene	ND	230	58	69	17.3	51	45	12.5	30 - 130	30	
Isophorone	ND	130	64	66	3.1	65	65	0.0	30 - 130	30	
Naphthalene	ND	230	65	67	3.0	66	66	0.0	30 - 130	30	
Nitrobenzene	ND	130	62	64	3.2	63	61	3.2	30 - 130	30	
N-Nitrosodimethylamine	ND	230	55	57	3.6	60	57	5.1	30 - 130	30	
N-Nitrosodi-n-propylamine	ND	130	68	69	1.5	67	67	0.0	30 - 130	30	
N-Nitrosodiphenylamine	ND	130	76	77	1.3	74	75	1.3	30 - 130	30	
Pentachloronitrobenzene	ND	230	76	76	0.0	73	73	0.0	30 - 130	30	
Pentachlorophenol	ND	230	65	63	3.1	68	61	10.9	30 - 130	30	
Phenanthrene	ND	130	75	75	0.0	73	72	1.4	30 - 130	30	
Phenol	ND	230	68	69	1.5	67	66	1.5	30 - 130	30	
Pyrene	ND	230	82	82	0.0	81	78	3.8	30 - 130	30	
Pyridine	ND	230	39	41	5.0	45	42	6.9	30 - 130	30	
% 2,4,6-Tribromophenol	69	%	73	74	1.4	75	72	4.1	30 - 130	30	
% 2-Fluorobiphenyl	66	%	67	69	2.9	69	69	0.0	30 - 130	30	
% 2-Fluorophenol	52	%	62	62	0.0	61	59	3.3	30 - 130	30	
% Nitrobenzene-d5	59	%	62	64	3.2	64	64	0.0	30 - 130	30	
% Phenol-d5	61	%	70	71	1.4	71	69	2.9	30 - 130	30	
% Terphenyl-d14	76	%	80	80	0.0	79	75	5.2	30 - 130	30	

Comment:

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 392456 (ug/Kg), QC Sample No: BY51909 2X (BY52240, BY52241, BY52242, BY52243, BY52244, BY52245)

Polychlorinated Biphenyls - Bulk

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
PCB-1016	ND	33	78	76	2.6	84	85	1.2	40 - 140	30
PCB-1221	ND	33							40 - 140	30

QA/QC Data

SDG I.D.: GBY52240

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
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	82	81	1.2	87	82	5.9	40 - 140	30	
PCB-1262	ND	33							40 - 140	30	
PCB-1268	ND	33							40 - 140	30	
% DCBP (Surrogate Rec)	57	%	54	84	43.5	100	110	9.5	30 - 150	30	r
% TCMX (Surrogate Rec)	90	%	87	84	3.5	93	88	5.5	30 - 150	30	

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
m = This parameter is outside laboratory MS/MSD specified recovery limits.
r = This parameter is outside laboratory RPD 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
July 17, 2017

Monday, July 17, 2017

Criteria: CT: GAM, RC

State: CT

Sample Criteria Exceedances Report

GBY52240 - FO

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BY52240	$8270-SMR	N-Nitrosodimethylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	330	200	200	ug/Kg
BY52240	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	380	200	200	ug/Kg
BY52240	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52240	$8270-SMR	1,2,4,5-Tetrachlorobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	280	100	100	ug/Kg
BY52240	$8270-SMR	Pyridine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	290	200	200	ug/Kg
BY52240	$8270-SMR	N-Nitrosodiphenylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	450	200	200	ug/Kg
BY52240	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	380	200	200	ug/Kg
BY52240	$8270-SMR	Nitrobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	410	200	200	ug/Kg
BY52240	$8270-SMR	Hexachlorobutadiene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	430	200	200	ug/Kg
BY52240	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	340	200	200	ug/Kg
BY52240	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52240	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52240	$8270-SMR	2,4,6-Trichlorophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	380	200	200	ug/Kg
BY52240	$8270-SMR	4-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	390	300	300	ug/Kg
BY52240	$8270-SMR	4-Chloroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	550	200	200	ug/Kg
BY52240	$8270-SMR	4,6-Dinitro-2-methylphenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	300	300	ug/Kg
BY52240	$8270-SMR	3-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	830	300	300	ug/Kg
BY52240	$8270-SMR	3,3'-Dichlorobenzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52240	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52240	$8270-SMR	2-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	830	300	300	ug/Kg
BY52240	$8270-SMR	N-Nitrosodimethylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	330	200	200	ug/Kg
BY52240	$8270-SMR	2,6-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	370	200	200	ug/Kg
BY52240	$8270-SMR	2,4-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	470	200	200	ug/Kg
BY52240	$8270-SMR	2,4-Dinitrophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	300	300	ug/Kg
BY52240	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52240	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	11.0	2.3	10	10	mg/Kg
BY52241	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52241	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	360	200	200	ug/Kg
BY52241	$8270-SMR	N-Nitrosodimethylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	320	200	200	ug/Kg
BY52241	$8270-SMR	N-Nitrosodiphenylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	430	200	200	ug/Kg
BY52241	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	360	200	200	ug/Kg
BY52241	$8270-SMR	N-Nitrosodimethylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	320	200	200	ug/Kg
BY52241	$8270-SMR	Nitrobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	390	200	200	ug/Kg
BY52241	$8270-SMR	Hexachlorobutadiene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	410	200	200	ug/Kg
BY52241	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	330	200	200	ug/Kg
BY52241	$8270-SMR	3,3'-Dichlorobenzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	530	200	200	ug/Kg
BY52241	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52241	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52241	$8270-SMR	Pyridine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	280	200	200	ug/Kg
BY52241	$8270-SMR	2,4,6-Trichlorophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	360	200	200	ug/Kg
BY52241	$8270-SMR	4,6-Dinitro-2-methylphenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	300	300	ug/Kg

Monday, July 17, 2017

Criteria: CT: GAM, RC

State: CT

Sample Criteria Exceedances Report

GBY52240 - FO

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BY52241	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52241	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	200	200	ug/Kg
BY52241	$8270-SMR	2,4-Dinitrophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	560	300	300	ug/Kg
BY52241	$8270-SMR	2,4-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	440	200	200	ug/Kg
BY52241	$8270-SMR	2,6-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	350	200	200	ug/Kg
BY52241	$8270-SMR	2-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	780	300	300	ug/Kg
BY52241	$8270-SMR	3-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	780	300	300	ug/Kg
BY52241	$8270-SMR	4-Chloroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	520	200	200	ug/Kg
BY52241	$8270-SMR	4-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	370	300	300	ug/Kg
BY52241	$8270-SMR	1,2,4,5-Tetrachlorobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	270	100	100	ug/Kg
BY52241	AS-SM	Arsenic	CT / RSR DEC RES (mg/kg) / Inorganics	20.1	2.1	10	10	mg/Kg
BY52242	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52242	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	320	200	200	ug/Kg
BY52242	$8270-SMR	N-Nitrosodimethylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	280	200	200	ug/Kg
BY52242	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52242	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52242	$8270-SMR	4-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	330	300	300	ug/Kg
BY52242	$8270-SMR	4-Chloroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	460	200	200	ug/Kg
BY52242	$8270-SMR	4,6-Dinitro-2-methylphenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	300	300	ug/Kg
BY52242	$8270-SMR	3-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	700	300	300	ug/Kg
BY52242	$8270-SMR	3,3'-Dichlorobenzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	470	200	200	ug/Kg
BY52242	$8270-SMR	2-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	700	300	300	ug/Kg
BY52242	$8270-SMR	2,6-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	310	200	200	ug/Kg
BY52242	$8270-SMR	2,4-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	390	200	200	ug/Kg
BY52242	$8270-SMR	2,4,6-Trichlorophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	320	200	200	ug/Kg
BY52242	$8270-SMR	1,2,4,5-Tetrachlorobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	240	100	100	ug/Kg
BY52242	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	290	200	200	ug/Kg
BY52242	$8270-SMR	2,4-Dinitrophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	300	300	ug/Kg
BY52242	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52242	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52242	$8270-SMR	Hexachlorobutadiene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	360	200	200	ug/Kg
BY52242	$8270-SMR	Nitrobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	350	200	200	ug/Kg
BY52242	$8270-SMR	N-Nitrosodimethylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	280	200	200	ug/Kg
BY52242	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	320	200	200	ug/Kg
BY52242	$8270-SMR	N-Nitrosodiphenylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	380	200	200	ug/Kg
BY52242	$8270-SMR	Pyridine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	250	200	200	ug/Kg
BY52243	$8270-SMR	N-Nitrosodimethylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	510	200	200	ug/Kg
BY52243	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	910	200	200	ug/Kg
BY52243	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	910	770	770	ug/Kg
BY52243	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	590	200	200	ug/Kg

Monday, July 17, 2017

Criteria: CT: GAM, RC

State: CT

Sample Criteria Exceedances Report

GBY52240 - FO

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BY52243	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	590	200	200	ug/Kg
BY52243	$8270-SMR	N-Nitrosodimethylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	510	200	200	ug/Kg
BY52243	$8270-SMR	N-Nitrosodiphenylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	700	200	200	ug/Kg
BY52243	$8270-SMR	Nitrobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	630	200	200	ug/Kg
BY52243	$8270-SMR	Hexachlorobutadiene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	660	200	200	ug/Kg
BY52243	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	530	200	200	ug/Kg
BY52243	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	200	200	ug/Kg
BY52243	$8270-SMR	Bis(2-chloroethoxy)methane	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	420	420	ug/Kg
BY52243	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	200	200	ug/Kg
BY52243	$8270-SMR	2,6-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	570	200	200	ug/Kg
BY52243	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	200	200	ug/Kg
BY52243	$8270-SMR	Pyridine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	450	200	200	ug/Kg
BY52243	$8270-SMR	1,2,4,5-Tetrachlorobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	440	100	100	ug/Kg
BY52243	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	200	200	ug/Kg
BY52243	$8270-SMR	2,4,6-Trichlorophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	580	200	200	ug/Kg
BY52243	$8270-SMR	2,4-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	710	200	200	ug/Kg
BY52243	$8270-SMR	2-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	1300	300	300	ug/Kg
BY52243	$8270-SMR	3,3'-Dichlorobenzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	860	200	200	ug/Kg
BY52243	$8270-SMR	3-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	1300	300	300	ug/Kg
BY52243	$8270-SMR	4,6-Dinitro-2-methylphenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	300	300	ug/Kg
BY52243	$8270-SMR	4-Chloroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	840	200	200	ug/Kg
BY52243	$8270-SMR	4-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	610	300	300	ug/Kg
BY52243	$8270-SMR	2,4-Dinitrophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	910	300	300	ug/Kg
BY52244	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	210	200	200	ug/Kg
BY52244	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	210	200	200	ug/Kg
BY52244	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	210	200	200	ug/Kg
BY52244	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	210	200	200	ug/Kg
BY52244	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	210	200	200	ug/Kg
BY52245	$8270-SMR	N-Nitrosodimethylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	410	200	200	ug/Kg
BY52245	$8270-SMR	Benzidine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	720	200	200	ug/Kg
BY52245	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR DEC RES (mg/kg) / APS Organics	ND	470	200	200	ug/Kg
BY52245	$8270-SMR	Benzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	200	200	ug/Kg
BY52245	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	200	200	ug/Kg
BY52245	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	420	200	200	ug/Kg
BY52245	$8270-SMR	Hexachlorobutadiene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	520	200	200	ug/Kg
BY52245	$8270-SMR	Nitrobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	500	200	200	ug/Kg
BY52245	$8270-SMR	Pyridine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	350	200	200	ug/Kg
BY52245	$8270-SMR	N-Nitrosodi-n-propylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	470	200	200	ug/Kg
BY52245	$8270-SMR	N-Nitrosodiphenylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	550	200	200	ug/Kg
BY52245	$8270-SMR	2,4,6-Trichlorophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	460	200	200	ug/Kg

Monday, July 17, 2017

Criteria: CT: GAM, RC

State: CT

Sample Criteria Exceedances Report

GBY52240 - FO

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
BY52245	$8270-SMR	N-Nitrosodimethylamine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	410	200	200	ug/Kg
BY52245	$8270-SMR	Aniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	200	200	ug/Kg
BY52245	$8270-SMR	4-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	480	300	300	ug/Kg
BY52245	$8270-SMR	4-Chloroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	670	200	200	ug/Kg
BY52245	$8270-SMR	4,6-Dinitro-2-methylphenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	300	300	ug/Kg
BY52245	$8270-SMR	3-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	1000	300	300	ug/Kg
BY52245	$8270-SMR	3,3'-Dichlorobenzidine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	680	200	200	ug/Kg
BY52245	$8270-SMR	2-Nitroaniline	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	1000	300	300	ug/Kg
BY52245	$8270-SMR	2,6-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	450	200	200	ug/Kg
BY52245	$8270-SMR	2,4-Dinitrophenol	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	300	300	ug/Kg
BY52245	$8270-SMR	1,2-Diphenylhydrazine	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	720	200	200	ug/Kg
BY52245	$8270-SMR	1,2,4,5-Tetrachlorobenzene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	340	100	100	ug/Kg
BY52245	$8270-SMR	2,4-Dinitrotoluene	CT / RSR GA,GAA (mg/kg) / APS Organics	ND	570	200	200	ug/Kg
BY52245	PB-SM	Lead	CT / RSR DEC RES (mg/kg) / Inorganics	1160	15	400	400	mg/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Fuss & O'Neill, Inc.

Project Location: VILLAGE CREEK ***Project Number:***

Laboratory Sample ID(s): BY52240-BY52245 ***Sampling Date(s):*** 6/30/2017

List RCP Methods Used (e.g., 8260, 8270, et cetera) 6010, 7470/7471, 8082, 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	***<u>VPH and EPH methods only:</u>*** **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 Sections: PCB Narration, SVOA Narration.**	☐ Yes ☑ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?**	☑ Yes ☐ No
	b) Were these reporting limits met?	☐ 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: Ethan Lee **Position:** Project Manager

Printed Name: Ethan Lee **Date:** Monday, July 17, 2017

Name of Laboratory Phoenix Environmental Labs, Inc.

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

CTDEP RCP Laboratory Analysis QA/QC Certification Form - November 2007
Laboratory Quality Assurance and Quality Control Guidance Reasonable Confidence Protocols

Environmental Laboratories, Inc.
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NY # 11301

RCP Certification Report

July 17, 2017

SDG I.D.: GBY52240

SDG Comments

Metals Analysis:
The client requested a site specific list of elements which is shorter than the 6010 RCP list. The following analytes from the 6010 RCP Metals list were not reported: Antimony, Beryllium, Copper, Nickel, Thallium, Vanadium, Zinc.

Semi-Volatile Analysis:
Where the LOD justifies lowering the RL/PQL, the RL/PQL of some compounds are evaluated below the lowest calibration standard in order to meet criteria. Not all requested reporting levels were achieved.

ETPH Narration

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

Instrument:

AU-FID84 07/06/17-1 Jeff Bucko, Chemist 07/06/17

BY52241, BY52242, BY52243, BY52244, BY52245

The initial calibration (ETPH523I) RSD for the compound list was less than 30% except for the following compounds: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

AU-XL1 07/06/17-1 Jeff Bucko, Chemist 07/06/17

BY52240

The initial calibration (ETPH623I) RSD for the compound list was less than 30% except for the following compounds: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

QC (Batch Specific):

Batch 392490 (BY51695)

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

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 07/06/17 09:45 Rick Schweitzer, Chemist 07/06/17

BY52240, BY52241, BY52242, BY52243

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.
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.

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ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Certification Report

July 17, 2017

SDG I.D.: GBY52240

Mercury Narration

MERLIN 07/07/17 09:40 Rick Schweitzer, Chemist 07/07/17

BY52244, BY52245

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not.
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 392566 (BY51905)

BY52240, BY52241, BY52242, BY52243

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 75-125%.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

Batch 392725 (BY52686)

BY52244, BY52245

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 75-125%.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

ICP Metals Narration

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

Instrument:

ARCOS 07/05/17 06:55 Laura Kinnin, Mike Arsenault, Chemist 07/05/17

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

Additional criteria for CCV and ICSAB:
Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB).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.

ARCOS 07/06/17 08:58 Laura Kinnin, Chemist 07/06/17

BY52245

PHOENIX

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Certification Report

July 17, 2017

SDG I.D.: GBY52240

ICP Metals Narration

Additional criteria for CCV and ICSAB:
Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB).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 392512 (BY52508)

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

All LCS recoveries were within 75 - 125 with the following exceptions: None.

PCB Narration

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

QC Batch 392456 (Samples: BY52240, BY52241, BY52242, BY52243, BY52244, BY52245): -----

The LCS/LCSD RPD exceeds the method criteria for one or more surrogates, therefore there may be variability in the reported result. (% DCBP (Surrogate Rec))

Instrument:

AU-ECD24 07/06/17-1 Adam Werner, Chemist 07/06/17

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

The initial calibration (PC616AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PC616BI) 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:None.

QC (Batch Specific):

Batch 392456 (BY51909)

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

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: % DCBP (Surrogate Rec)(43.5%)

SVOA Narration

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

QC Batch 392461 (Samples: BY52240, BY52241, BY52242, BY52243, BY52244, BY52245): -----

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. (2,4-Dinitrophenol)

The QC recoveries for one or more analytes is below the method criteria. A slight low bias is likely. (Benzidine, Benzoic Acid)

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RCP Certification Report

July 17, 2017

SDG I.D.: GBY52240

SVOA Narration

Instrument:

CHEM05 07/06/17-1 Damien Drobinski, Chemist 07/06/17

BY52244

Initial Calibration Verification (CHEM05/SV_0616):
95% of target compounds met criteria.
The following compounds had %RSDs >20%: 2,4-Dinitrophenol 29% (20%), Benzidine 35% (20%)
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.068 (0.1)
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM05/0706_02-SV_0616):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
99% 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 recommended response factors: 2-Nitrophenol 0.061 (0.1)
The following compounds did not meet minimum response factors: None.

CHEM19 07/05/17-1 Damien Drobinski, Chemist 07/05/17

BY52242, BY52243, BY52245

The DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

Initial Calibration Verification (CHEM19/SV_0620):
95% of target compounds met criteria.
The following compounds had %RSDs >20%: 2,4-Dinitrophenol 25% (20%), 3,3'-Dichlorobenzidine 23% (20%), Benzidine 28% (20%)
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.064 (0.1), Hexachlorobenzene 0.088 (0.1)
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM19/0705_04-SV_0620):
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 recommended response factors: 2-Nitrophenol 0.058 (0.1), Hexachlorobenzene 0.081 (0.1)
The following compounds did not meet minimum response factors: None.

CHEM29 07/05/17-1 Damien Drobinski, Chemist 07/05/17

BY52240, BY52241

Initial Calibration Verification (CHEM29/SV_0705):
98% of target compounds met criteria.
The following compounds had %RSDs >20%: Benzidine 21% (20%)
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.085 (0.1)
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM29/0705_12-SV_0705):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

Environmental Laboratories, Inc.
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NY # 11301

RCP Certification Report

July 17, 2017

SDG I.D.: GBY52240

SVOA Narration

99% of target compounds met criteria.
The following compounds did not meet % deviation criteria: Benzidine 36%H (30%)
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.086 (0.1)
The following compounds did not meet minimum response factors: None.

QC (Batch Specific):

Batch 392461 (BY51906)

BY52240, BY52241, BY52242, BY52243, BY52244, BY52245

All LCS recoveries were within 30 - 130 with the following exceptions: Benzidine(18%), Benzoic Acid(<10%)
All LCSD recoveries were within 30 - 130 with the following exceptions: 2,4-Dinitrophenol(29%), Benzidine(20%), Benzoic Acid(<10%)
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
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%)

Temperature Narration

The samples were received at 2.9C with cooling initiated.
(Note acceptance criteria is above freezing up to 6°C)

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☐ 56 Quarry Road, Trumbull, CT 06611
☐ 1419 Richland Street, Columbia, SC 29201
☐ 78 Interstate Drive, West Springfield, MA 01089
☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908
☐ 80 Washington Street, Suite 301, Poughkeepsie, NY
☐ Other 2.9° w/c + IP

CHAIN-OF-CUSTODY RECORD 31576

Turnaround
☐ 24-Hour* ☐ 72-Hour* ☐ Other ______ (days)
☐ 48-Hour* ☐ Standard (____ days) *Surcharge Applies

PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER	LABORATORY
VILLAGE CREEK	NORWALK, CT	20161030.A10	Phoenix

REPORT TO: JOSH WILSON
INVOICE TO: ↓
P.O. NO.: 20161030.A10
Sampler's Signature: [signature] Date: 6/30/17

Source Codes:
MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment
SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete
X=Other

Analysis Request: TOTAL METALS (As, Ba, Cd, Cr, Pb, Hg, Se, Ag); ETPH; SVOC (8270); PCB (Aroclors); Grain Size, TOC, pH

Containers: Soil VOA Vial, ☐ methanol; Soil VOA Vial, ☐ water; Glass Soil Container (8) oz ☐ Na(SO4)2; Other: 1 gallon Ziploc; Other:; Water VOA Vial, ☐ As is ☐ HCl; Glass Amber ( ) ml, ☐ As is ☐ H2SO4; Plastic - As is, 250 ml ☐ 500 ☐ 1000 ml; Plastic - H2SO4, 250 ml ☐ 500 ml; Plastic - HNO3, 250 ml ☐ Filtered ☐ 0.45µ ☐ 10µ; Plastic - NaOH, 250 ml

Item No.	Transfer Check 1	2	3	4	Sample Number	Source Code	Date Sampled	Time Sampled	Total Metals	ETPH	SVOC (8270)	PCB (Aroclors)	Grain Size, TOC, pH	Glass Soil Container (8) oz	Other: 1 gallon Ziploc	Comments
1					6990630l7-01	B	6/30/17	1045	✓	✓	✓	✓	✓	3	1	52240
2					-02	↓	↓	1120	↓	↓	↓	↓	↓	↓	↓	52241
3					-03	↓	↓	1215	↓	↓	↓	↓	↓	↓	↓	52242
4					-04	↓	↓	1250	↓	↓	↓	↓	↓	↓	↓	52243
5					-05	↓	↓	1335	↓	↓	↓	↓	↓	↓	↓	52244
6					-06	↓	↓	1410	↓	↓	↓	↓	↓	↓	↓	52245

Transfer Number	Relinquished By	Accepted By	Date	Time
1	[signature]	F&O Fridge	6/30/17	
2	F+O FRIDGE	[signature]	7/5/17	1636
3	[signature]	[signature]	7/5/17	1700
4				

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other ______
____ Duplicates ____ Blanks (Item Nos:)

Reporting and Detection Limit Requirements: ☒ RCP Deliverables ☐ MCP CAM Cert.
RES DEC/GA (RSR)

Additional Comments: *did not rcv plastic bags-Gary to p/u 7/6

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203) 468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1256

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52240

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	100
½" (12.5mm)	100
⅜" (9.5mm)	40
¼" (6.3mm)	40
#10 (2.0mm)	28
#20 (850µm)	24
#40 (425µm)	21
#100 (150µm)	20
#200 (75µm)	18.0

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER

7/13/17

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

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

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:
[ ] Fax #:
[ ] Email:

~~Customer:~~ TO Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ______ Date: ______

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

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Sieve	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz ( )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 (as is)	Bacteria (w/thio)
B452240		S	6-30-17	10:45	X										
B452241		↓	↓	11:20	X										
B452242		↓	↓	12:15	X										
B452243		↓	↓	12:50	X										
B452244		↓	↓	13:35	X										
B452245		↓	↓	14:10	X										

Relinquished by:	Accepted by:	Date:	Time:
Lori Bailey	[signature]	7-7-17	8:20
[signature]	Wendy L Bley	7/7	9:00

Comments, Special Requirements or Regulations:

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

RI
[ ] Direct Exposure (Residential)
[ ] GW
[ ] Other

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

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

State where samples were collected: Ct

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

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

MATERIALS TESTING, INC.

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42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1257

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52241

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	100
½" (12.5mm)	100
⅜" (9.5mm)	100
¼" (6.3mm)	35
#10 (2.0mm)	20
#20 (850µm)	19
#40 (425µm)	18
#100 (150µm)	17
#200 (75µm)	15.8

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER
7/13/17

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐
Temp °C Pg of

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:
☐ Fax #:
☐ Email:

~~Customer:~~ TO: Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ____ Date: ____

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

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Seve	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz ( )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 (as is)	Bacteria (w/thio)
B452240		S	6-30-17	10:45	X										
B452241				11:20	X										
B452242				12:15	X										
B452243				12:50	X										
B452244				13:35	X										
B452245				14:10	X										

Relinquished by:	Accepted by:	Date:	Time:
Rob Bailey	Colin	7-7-17	8:20
Colin	Wendy L Bley	7/7	9:00

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

State where samples were collected: CT

MATERIALS TESTING, INC.
55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203) 468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1258

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52242

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	100
½" (12.5mm)	100
⅜" (9.5mm)	82
¼" (6.3mm)	55
#10 (2.0mm)	32
#20 (850µm)	25
#40 (425µm)	20
#100 (150µm)	16
#200 (75µm)	14.1

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER
7/13/17

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐

CHAIN OF CUSTODY RECORD

Temp °C Pg of

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:
☐ Fax #:
☐ Email:

~~Customer:~~ TO Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ________ Date: ________

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

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Sieve	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz ( )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 (as is)	Bacteria (w/thio)
B452240		S	6-30-17	10:45	X										
B452241				11:20	X										
B452242				12:15	X										
B452243				12:50	X										
B452244				13:35	X										
B452245				14:10	X										

Relinquished by:	Accepted by:	Date:	Time:
Lori Bailey	Colosha	7-7-17	8:20
Colosha	Wendy L. Bley	7/7	9:00

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

State where samples were collected: CT

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

MATERIALS TESTING, INC.

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42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1259

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52243

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	100
½" (12.5mm)	88
⅜" (9.5mm)	84
¼" (6.3mm)	76
#10 (2.0mm)	60
#20 (850µm)	55
#40 (425µm)	51
#100 (150µm)	47
#200 (75µm)	45.3

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER
7/13/17

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐
Temp °C Pg of

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:
☐ Fax #:
☐ Email:

~~Customer:~~ TO Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ____ Date: ____

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

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Sieve	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz ( )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 (as is)	Bacteria (w/thio)
B452240		S	6-30-17	10:45	X										
B452241		↓	↓	11:20	X										
B452242		↓	↓	12:15	X										
B452243		↓	↓	12:50	X										
B452244		↓	↓	13:35	X										
B452245		↓	↓	14:10	X										

Relinquished by:	Accepted by:	Date:	Time:
Rob Bailey	[signature]	7-7-17	8:20
[signature]	Wendy L Bley	7/7	9:00

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

State where samples were collected: Ct

MATERIALS TESTING, INC.

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42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1260

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52244

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	92
½" (12.5mm)	84
⅜" (9.5mm)	76
¼" (6.3mm)	71
#10 (2.0mm)	57
#20 (850µm)	47
#40 (425µm)	29
#100 (150µm)	11
#200 (75µm)	6.8

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER
7/13/17

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐

CHAIN OF CUSTODY RECORD

Temp °C Pg of

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:
☐ Fax #:
☐ Email:

~~Customer:~~ To: Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ______ Date: ______

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

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Metals	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz ( )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 (as is)	Bacteria (w/thio)
B452240		S	6-30-17	10:45	X										
B452241				11:20	X										
B452242				12:15	X										
B452243				12:50	X										
B452244				13:35	X										
B452245				14:10	X										

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-7-17	8:20
[signature]	Wendy J Bly	7/7	9:00

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

State where samples were collected: Ct

* SURCHARGE APPLIES

MATERIALS TESTING, INC.

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42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 07-12-17

REPORT: M-1261

CLIENT: Phoenix Environmental Laboratories, Inc.
PO Box 370
Manchester, CT 06040
Attn: Bobbi Aloisa

PROJECT: Client's Information

SUBJECT: **WASHED SIEVE ANALYSIS (ASTM C-136, D1140)**

Material: Fine Sandy Soil

Source: Client's Sample # BY52245

Sampled: by client and delivered to MTI on 7/7/17

Sieve Size	Percent Passing
1" (25mm)	100
¾" (19mm)	100
½" (12.5mm)	96
⅜" (9.5mm)	79
¼" (6.3mm)	69
#10 (2.0mm)	54
#20 (850µm)	45
#40 (425µm)	40
#100 (150µm)	35
#200 (75µm)	34.3

A material specification was not provided at this time.

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

File: Original
1cc: Client
Attachment: (1) Chain of Custody

wlb

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STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER
7/13/17

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

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:
[ ] Fax #:
[ ] Email:

~~Customer:~~ TO: Materials Testing
Address:

Project:
Report to: Bobbi Aloisa
Invoice to:
Phone #:
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ________ Date: ________

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

Analysis Request

Soil VOA Vials [ ] methanol [ ] H2O
GL Soil container ( )oz ( )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 (as is)
Bacteria (w/thio)

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Sieve
B452240		S	6-30-17	10:45	X
B452241		↓	↓	11:20	X
B452242		↓	↓	12:15	X
B452243		↓	↓	12:50	X
B452244		↓	↓	13:35	X
B452245		↓	↓	14:10	X

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-7-17	8:20
[signature]	Wendy L. [signature]	7/7	9:00

Comments, Special Requirements or Regulations:

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

RI
[ ] Direct Exposure (Residential)
[ ] GW
[ ] Other

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

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

State where samples were collected: Ct

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

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

* SURCHARGE APPLIES